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FULL LINE CONDENSED CATALOG

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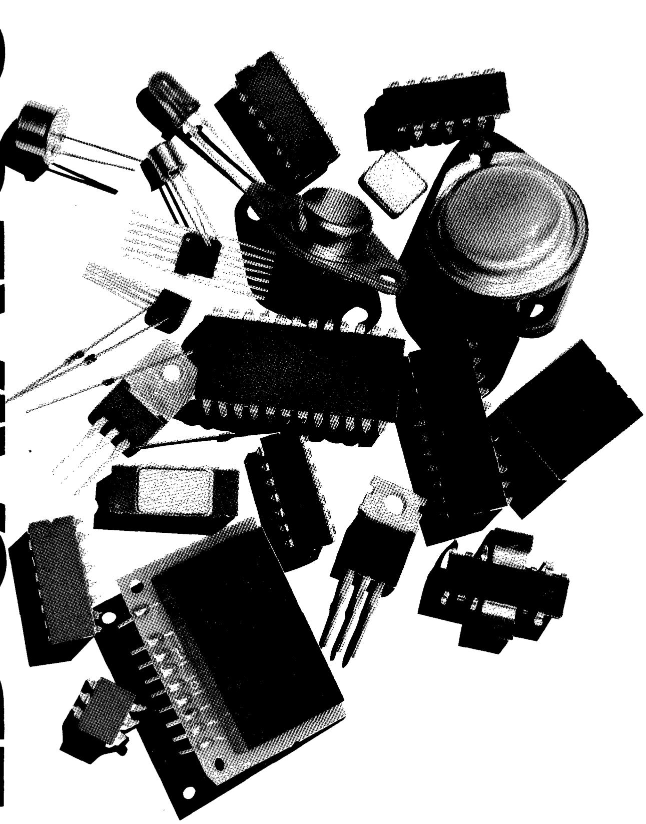

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INTRODUCTION

This full line condensed catalog is quick reference source on all Fairchild semiconductor products. It contains three basic types of information — numerical product listing, short-form data and general reference material — organized into the following sections:

Section 1 — Product Index
Numerical index listing device types, general product category, and the catalog page and line item number were the actual short-form data can be found.

Due to the complexity and variety of device numbering systems now used in the semiconductor industry, the product index is organized in a numeric-alpha sequence. Device order is dependent first on the numeric value of the first digit on the left, then on the value of the second digit, then the third et cetera, regardless of the total numeric value of the device number. For example, device number 10000 will preceed device number 900. Device number 54107 will follow 5410 and preceed device number 5411. Device numbers containing a letter of the alphabet are placed after devices containing no alpha character. For example, the 74H series of device numbers follows the last 7400 series number, 7497.

Sections 2 through 11 — Selection Guides
Diodes, Transistors, Optoelectronics, Charge-Coupled Devices, Hybrids, Linear, Interface, Digital, Memories, Microcomputers are organized into functional selection guides for easy reference. More complete product data is available from Fairchild in data books, application handbooks or notes, and individual data sheets.

Section 12 — Aerospace and Defense
Lists currently qualified Jan QPL products.

Section 13 — Logic/Connection Diagrams
Logic and/or connection diagrams organized by product types in the order shown in the Table of Contents.

Section 14 — Ordering Information and Package Outlines

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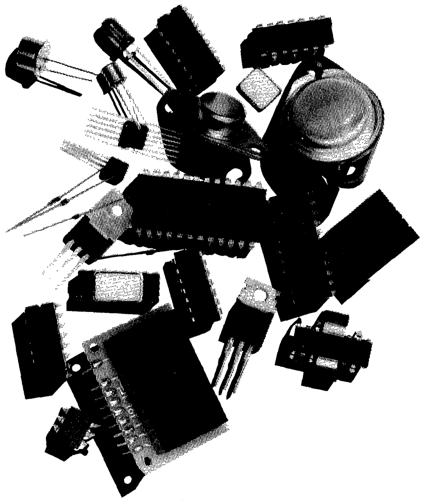

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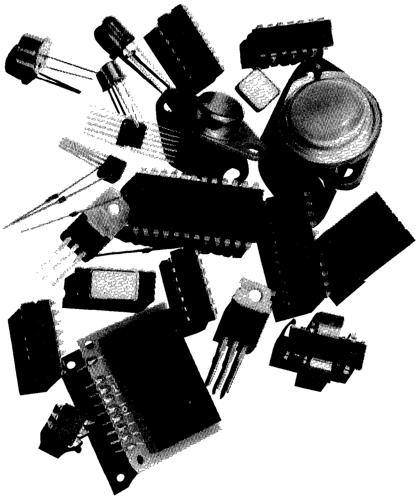

DIODES

COMPUTER DIODES (BY ASCENDING t_{rr})

GLASS PACKAGE

Item	DEVICE NO.	t_{rr} ns Max	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	Package No.
1	**FD700**	0.70	30	50		20	1.1		50	1.0	DO-7
2	**1N4376**	0.75	20	100		10	1.1		50	1.0	DO-7
3	**BAY82**	0.75	15	100		12	1.0		20	1.3	DO-7
4	**FD777**	0.75	15	100		8.0	1.0		20	1.3	DO-7
5	**1N5282**	2.0	80	100		55	1.3		500	2.5	DO-35
6	**1N4153**	2.0	75	50		50	0.88		20	4.0	DO-35
7	**1N4151**	2.0	75	50		50	1.0		50	4.0	DO-35
8	**1N4305**	2.0	75	100		50	0.85		10	2.0	DO-35
9	**BAY71**	2.0	50	100		35	1.0		20	2.0	DO-35
10	**1N4152**	2.0	40	50		30	0.88		20	4.0	DO-35
11	**1N4154**	2.0	35	100		25	1.0		30	4.0	DO-35
12	**1N914**	4.0	100	25		20	1.0		10	4.0	DO-35
13	**1N914A**	4.0	100	25		20	1.0		20	4.0	DO-35
14	**1N914B**	4.0	100	25		20	1.0		100	4.0	DO-35
15	**1N916**	4.0	100	25		20	1.0		10	2.0	DO-35
16	**1N916A**	4.0	100	25		20	1.0		20	2.0	DO-35
17	**1N916B**	4.0	100	25		20	1.0		30	2.0	DO-35
18	**1N4148**	4.0	100	25		20	1.0		10	4.0	DO-35
19	**1N4149**	4.0	100	25		20	1.0		10	2.0	DO-35
20	**1N4446**	4.0	100	25		20	1.0		20	4.0	DO-35
21	**1N4447**	4.0	100	25		20	1.0		20	4.0	DO-35
22	**1N4448**	4.0	100	25		20	1.0		100	2.0	DO-35
23	**1N4449**	4.0	100	25		20	1.0		30	2.0	DO-35
24	**1N3604**	4.0	75	50		50	1.0		50	2.0	DO-35
25	**1N3600**	4.0	75	100		50	1.0		200	2.5	DO-35
26	**FDH600**	4.0	75	100		50	1.0		200	2.5	DO-35
27	**1N3064**	4.0	75	100		50	1.0		10	2.0	DO-35
28	**1N4150**	4.0	75	100		50	1.0		200	2.5	DO-35
29	**1N4454**	4.0	75	100		50	1.0		10	2.0	DO-35
30	**BAX13**	4.0	50	200		50	1.0		20	3.0	DO-35
31	**BAY74**	4.0	50	100		35	1.1		300	3.0	DO-35
32	**FDH900**	4.0	45	500		40	1.1		100	3.0	DO-35

DIODES

COMPUTER DIODES (BY ASCENDING t_{rr}) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	t_{rr} ns Max	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	Package No.
1	**FDH666**	4.0	40	100		25	1.0		100	3.5	DO-35
2	**1N4450**	4.0	40	50		30	1.0		200	4.0	DO-35
3	**1N4009**	4.0	35	100		25	1.0		30	4.0	DO-35
4	**1N625**	4.0	30	1000		20	1.5		4.0	—	DO-35
5	**FDH999**	5.0	35	1000		25	1.0		10	5.0	DO-35

LOW LEAKAGE DIODES (BY DESCENDING BV)

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	Package No.
6	**1N486B**	250	50		225	1.0		100	—	DO-35
7	**1N485B**	200	25		180	1.0		100	—	DO-35
8	**1N459**	200	25		175	1.0		3.0	—	DO-35
9	**1N459A**	200	25		175	1.0		100	—	DO-35
10	**FDH300**	150	1.0		125	1.0		200	6.0	DO-35
11	**1N3595**	150	1.0		125	1.0		200	8.0	DO-35
12	**FDH333**	150	3.0		125	1.05		200	6.0	DO-35
13	**1N458A**	150	5.0		125	1.0		100	—	DO-35
14	**1N484B**	150	25		130	1.0		100	—	DO-35
15	**1N458**	150	25		125	1.0		7.0	6.0	DO-35
16	**BAY73**	125	5.0		100	1.0		200	8.0	DO-35
17	**1N483B**	80	25		70	1.0		100	—	DO-35
18	**1N457**	70	25		60	1.0		20	8.0	DO-35
19	**1N457A**	70	25		60	1.0		100	—	DO-35
20	**1N482B**	40	25		36	1.0		100	—	DO-35
21	**FJT1100**	30	0.001		5.0	1.05		10	1.5	DO-7
22	**1N456A**	30	25		25	1.0		100	—	DO-35
23	**1N456**	30	25		25	1.0		40	10	DO-35

DIODES

HIGH VOLTAGE SWITCHING DIODES (BY DESCENDING BV)

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	t_{rr} ns Max	Package No.
1	**1N661**	240	10000		200	1.0		6.0	—	300	DO-35
2	**FDH400**	200	100		150	1.0		200	2.0	50	DO-35
3	**1N3070**	200	100		175	1.0		100	5.0	50	DO-35
4	**1N643**	200	1000		100	1.0		10	3.0	300	DO-35
5	**1N842**	200	100		160	1.0		150	—	300	DO-35
6	**1N629**	200	1000		175	1.5		4.0	—	1000	DO-35
7	**FDH444**	150	50		100	1.1		200	2.5	60	DO-35
8	**1N628**	150	1000		125	1.5		4.0	—	1000	DO-35
9	**BAY72**	125	100		100	1.0		100	5.0	50	DO-35
10	**1N658**	120	50		50	1.0		100	—	300	DO-35
11	**1N660**	120	5000		100	1.0		6.0	—	300	DO-35
12	**1N627**	100	1000		75	1.5		4.0	—	1000	DO-35
13	**1N626**	50	1000		35	1.5		4.0	—	1000	DO-35

GENERAL PURPOSE DIODES (BY DESCENDING BV)

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	t_{rr} ns Max	Package No.
14	**1N661**	240	10000		200	1.0		6.0	—	300	DO-35
15	**1S923**	200	100		200	1.2		200	—	—	DO-35
16	**1N463A**	200	500		175	1.0		100	—	—	DO-35
17	**BA129**	200	10		180	1.0		50	6.0	—	DO-35
18	**1S922**	150	100		150	1.2		200	—	—	DO-35
19	**BAX16**	150	100		150	1.0		1.0	10	120	DO-35
20	**1N660**	120	5000		100	1.0		6.0	—	—	DO-35
21	**1S921**	100	100		100	1.2		200	—	—	DO-35
22	**BA219**	100	200		50	0.85		10	5.0	—	DO-35
23	**BA128**	75	100		50	1.0		50	5.0	—	DO-35
24	**1N462A**	70	500		60	1.0		100	—	—	DO-35
25	**1N659**	60	5000		50	1.0		6.0	—	—	DO-35
26	**1S920**	50	100		50	1.2		200	—	—	DO-35

DIODES

GENERAL PURPOSE DIODES (BY DESCENDING BV) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	t_{rr} ns Max	Package No.
1	**BA218**	50	50		25	1.0		10	5.0	—	DO-35
2	**1S44**	50	50		10	1.15		10	6.0	—	DO-35
3	**FDH900**	45	500		40	1.1		100	3.0	4.0	DO-35
4	**FDH999**	35	1000		25	1.0		10	5.0	5.0	DO-35
5	**1N461A**	30	500		25	1.0		100	10	—	DO-35
6	**BA217**	30	50		10	1.0		10	5.0	—	DO-35
7	**BA130**	30	100		25	1.0		10	2.0	—	DO-35
8	**BA164**	20	2000		15	1.0		10	—	—	DO-35
9	**BA216**	10	1500		10	1.0		15	—	—	DO-35

MILITARY QUALIFIED SMALL SIGNAL DIODES (NUMERIC LISTING)

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	t_{rr} ns Max	Package No.
10	**1N457JAN**	70	25		60	1.0		20	6.0	—	DO-7
11	**1N458JAN**	150	25		125	1.0		7.0	6.0	—	DO-7
12	**1N459JAN**	200	25		175	1.0		3.0	6.0	—	DO-7
13	**1N483BJAN**	80	25		70	1.0		100	—	—	DO-7
14	**1N483BJANTX**	80	25		70	1.0		100	—	—	DO-7
15	**1N485BJAN**	200	25		180	1.0		100	—	—	DO-7
16	**1N485BJANTX**	200	25		180	1.0		100	—	—	DO-7
17	**1N486BJAN**	250	25		225	1.0		100	—	—	DO-7
18	**1N486BJANTX**	250	25		225	1.0		100	—	—	DO-7
19	**1N914JAN**	100	25		20	1.0		10	4.0	4.0	DO-35
20	**1N914JANTX**	100	25		20	1.0		10	4.0	4.0	DO-35
21	**1N3064JAN**	75	100		50	1.0		10	2.0	4.0	DO-7
22	**1N3064JANTX**	75	100		50	1.0		10	2.0	4.0	DO-7
23	**1N3595JAN**	150	1.0		125	1.0		200	8.0	3000	DO-7
24	**1N3595JANTX**	150	1.0		125	1.0		200	8.0	3000	DO-7
25	**1N3595JANTXV**	150	1.0		125	1.0		200	8.0	3000	DO-7
26	**1N3600JAN**	75	100		50	1.0		200	2.5	4.0	DO-7
27	**1N3600JANTX**	75	100		50	1.0		200	2.5	4.0	DO-7

DIODES

MILITARY QUALIFIED SMALL SIGNAL DIODES (NUMERIC LISTING) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	t_{rr} ns Max	Package No.
1	**1N3600JANTXV**	75	100		50	1.0		200	2.5	4.0	DO-7
2	**1N4148JAN**	100	25		20	1.0		10	4.0	4.0	DO-35
3	**1N4148JANTX**	100	25		20	1.0		10	4.0	4.0	DO-35
4	**1N4148JANTXV**	100	25		20	1.0		10	4.0	4.0	DO-35
5	**1N4148-1JAN**	100	25		20	1.0		10	4.0	4.0	DO-35
6	**1N4148-1JANTX**	100	25		20	1.0		10	4.0	4.0	DO-35
7	**1N4148-1JANTXV**	100	25		20	1.0		10	4.0	4.0	DO-35
8	**1N4150JAN**	75	100		50	1.0		200	2.5	4.0	DO-35
9	**1N4150JANTX**	75	100		50	1.0		200	2.5	4.0	DO-35
10	**1N4150JANTXV**	75	100		50	1.0		200	2.5	4.0	DO-35
11	**1N4150-1JAN**	75	100		50	1.0		200	2.5	4.0	DO-35
12	**1N4150-1JANTX**	75	100		50	1.0		200	2.5	4.0	DO-35
13	**1N4150-1JANTXV**	75	100		50	1.0		200	2.5	4.0	DO-35
14	**1N4376JAN**	20	100		10	1.1		50	1.0	0.75	DO-7
15	**1N4376JANTX**	20	100		10	1.1		50	1.0	0.75	DO-7
16	**1N4454JAN**	75	100		50	1.0		10	2.0	4.0	DO-35
17	**1N4454JANTX**	75	100		50	1.0		10	2.0	4.0	DO-35
18	**1N4454JANTXV**	75	100		50	1.0		10	2.0	4.0	DO-35
19	**1N4454-1JAN**	75	100		50	1.0		10	2.0	4.0	DO-35
20	**1N4454-1JANTX**	75	100		50	1.0		10	2.0	4.0	DO-35
21	**1N4454-1JANTXV**	75	100		50	1.0		10	2.0	4.0	DO-35

HOT CARRIER DIODE

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	V_F V Max	@	I_F mA	C pF Max	NF dB Max	Package No.
22	**FH1100**	5.0	50		1.0	0.55		10	1.0	10	DO-7

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DIODES

VOLTAGE VARIABLE CAPACITOR DIODES

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	C pF Max	Figure of Merit (Q) Min	C1/C4 $V_{R1} = 0.1V$ $V_{R4} = 4.0V$	C3/C20 $V_{R3} = 3V$ $V_{R20} = 20V$	Package No.
1	**RF400**	35	30		30	10	350	2.0	2.0	DO-35
2	**RF401**	35	30		30	7.0	350	2.0	2.0	DO-35

BANDSWITCH DIODES

GLASS PACKAGE

Item	DEVICE NO.	BV V Min	I_R nA Max	@	V_R V	C pF Max	R_S Ω Max	V_F V Max	@	I_F mA	Package No.
3	**BA243**	20	100		15	2.0	1.0	1.0		100	DO-35
4	**BA244**	20	100		15	2.0	0.5	1.0		100	DO-35

ZENER DIODES (BY ASCENDING V_Z)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol.* $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Typ (Max)	P_D mW T_A=25°C	Package No.
5	**1N5221B**	2.4	5	30	20	100	1.0	(-.085)	500	DO-35
6	**BZX55C2V4**	2.4	5	80	5.0	50	1.0	-.080	500	DO-35
7	**1N5222B**	2.5	5	30	20	100	1.0	(-.085)	500	DO-35
8	**1N5223B**	2.7	5	30	20	75	1.0	(-.080)	500	DO-35
9	**BZX55C2V7**	2.7	5	75	5.0	50	1.0	-.070	500	DO-35
10	**ZPD2,7**	2.7	5	83	5.0	—	—	(-.090)	500	DO-35
11	**1N5224B**	2.8	5	30	20	75	1.0	(-.080)	500	DO-35
12	**1N5225B**	3.0	5	29	20	50	1.0	(-.075)	500	DO-35
13	**BZX55C3V0**	3.0	5	80	5.0	40	1.0	-.065	500	DO-35
14	**ZPD3**	3.0	5	90	5.0	—	—	(-.090)	500	DO-35
15	**1N746A**	3.3	5	28	20	10	1.0	-.070	500	DO-35
16	**1N5226B**	3.3	5	28	20	25	1.0	(-.070)	500	DO-35
17	**BZX55C3V3**	3.3	5	85	5.0	40	1.0	-.060	500	DO-35
18	**BZY88C3V3**	3.3	5	22	20	3.0	1.0	(-.091)	500	DO-35
19	**ZPD3,3**	3.3	5	90	5.0	—	—	(-.080)	500	DO-35

*Tolerance: All zener diodes are also available in ±1%, ±2%, ±10% and ±20% tolerances.

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DIODES

ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol.* $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Typ (Max)	P_D mW T_A=25°C	Package No.
1	1N4728A	3.3	5	10	76	100	1.0	—	1000	DO-41
2	BZX85C3V3	3.3	5	20	80	40	1.0	−.065	1000	DO-41
3	1N747A	3.6	5	24	20	10	1.0	−.065	500	DO-35
4	1N5227B	3.6	5	24	20	15	1.0	(−.065)	500	DO-35
5	BZX55C3V6	3.6	5	85	5.0	40	1.0	−.055	500	DO-35
6	BZY88C3V6	3.6	5	20	20	3.0	1.0	(−.069)	500	DO-35
7	ZPD3,6	3.6	5	90	5.0	—	—	(−.080)	500	DO-35
8	1N4729A	3.6	5	10	69	100	1.0	—	1000	DO-41
9	BZX85C3V6	3.6	5	15	60	20	1.0	−.065	1000	DO-41
10	1N748A	3.9	5	23	20	10	1.0	−.060	500	DO-35
11	1N5228B	3.9	5	23	20	10	1.0	(−.060)	500	DO-35
12	BZX55C3V9	3.9	5	80	5.0	40	1.0	−.050	500	DO-35
13	BZY88C3V9	3.9	5	18	20	3.0	1.0	(−.062)	500	DO-35
14	ZPD3,9	3.9	5	90	5.0	—	—	(−.070)	500	DO-35
15	1N4730A	3.9	5	9.0	64	50	1.0	—	1000	DO-41
16	BZX85C3V9	3.9	5	15	60	10	1.0	−.045	1000	DO-41
17	1N749A	4.3	5	22	20	2.0	1.0	±.055	500	DO-35
18	1N5229B	4.3	5	22	20	5.0	1.0	(±.055)	500	DO-35
19	BZX55C4V3	4.3	5	70	5.0	40	1.5	−.040	500	DO-35
20	BZY88C4V3	4.3	5	17	20	3.0	1.0	(−.047)	500	DO-35
21	ZPD4,3	4.3	5	90	5.0	—	—	(−.060)	500	DO-35
22	1N4731A	4.3	5	9.0	58	10	1.0	—	1000	DO-41
23	BZX85C4V3	4.3	5	13	50	3.0	1.0	−.020	1000	DO-41
24	1N750A	4.7	5	19	20	2.0	1.0	±.043	500	DO-35
25	1N5230B	4.7	5	19	20	5.0	2.0	(±.030)	500	DO-35
26	BZX55C4V7	4.7	5	60	5.0	30	1.5	−.020	500	DO-35
27	BZY88C4V7	4.7	5	17	20	3.0	2.0	(−.032)	500	DO-35
28	ZPD4,7	4.7	5	78	5.0	—	—	(−.050)	500	DO-35
29	1N4732A	4.7	5	8.0	53	10	1.0	—	1000	DO-41
30	BZX85C4V7	4.7	5	13	45	3.0	1.5	+.005	1000	DO-41
31	1N751A	5.1	5	17	20	1.0	1.0	±.030	500	DO-35

*Tolerance: All zener diodes are also available in ±1%, 2±%, ±10% and ±20% tolerances.

DIODES

ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol.* $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R µA Max	@ V_R V	T.C. %/°C Typ (Max)	P_D mW T_A=25°C	Package No.
1	1N5231B	5.1	5	17	20	5.0	2.0	(±.030)	500	DO-35
2	BZX55C5V1	5.1	5	35	5.0	2.0	1.0	+.010	500	DO-35
3	BZY88C5V1	5.1	5	11	20	1.0	2.0	(-.030)	500	DO-35
4	ZPD5,1	5.1	5	60	5.0	0.1	0.8	(+.040)	500	DO-35
5	1N4733A	5.1	5	7.0	49	10	1.0	—	1000	DO-41
6	BZX85C5V1	5.1	5	10	45	1.0	2.0	+.010	1000	DO-41
7	1N752A	5.6	5	11	20	1.0	1.0	+.028	500	DO-35
8	1N5232B	5.6	5	11	20	5.0	3.0	(±.038)	500	DO-35
9	BZX55C5V6	5.6	5	25	5.0	2.0	1.0	+.025	500	DO-35
10	BZY88C5V6	5.6	5	8	20	1.0	2.0	(+.054)	500	DO-35
11	ZPD5,6	5.6	5	40	5.0	0.1	1.0	(+.060)	500	DO-35
12	1N4734A	5.6	5	5.0	45	10	2.0	—	1000	DO-41
13	BZX85C5V6	5.6	5	7.0	45	1.0	2.0	+.025	1000	DO-41
14	1N5233B	6.0	5	7.0	20	5.0	3.5	(+.038)	500	DO-35
15	1N753A	6.2	5	7.0	20	0.1	1.0	+.045	500	DO-35
16	1N5234B	6.2	5	7.0	20	5.0	4.0	(+.045)	500	DO-35
17	BZX55C6V2	6.2	5	10	5.0	2.0	2.0	+.032	500	DO-35
18	BZY88C6V2	6.2	5	3.1	20	1.0	2.0	(+.065)	500	DO-35
19	ZPD6,2	6.2	5	10	5.0	0.1	2.0	(+.070)	500	DO-35
20	1N4735A	6.2	5	2.0	41	10	3.0	—	1000	DO-41
21	BZX85C6V2	6.2	5	4.0	35	1.0	3.0	+.032	1000	DO-41
22	1N754A	6.8	5	5.0	20	0.1	1.0	+.050	500	DO-35
23	1N957B	6.8	5	4.5	18.5	150	5.2	+.050	500	DO-35
24	1N5235B	6.8	5	5.0	20	3.0	5.0	(+.050)	500	DO-35
25	BZX55C6V8	6.8	5	8.0	5.0	2.0	3.0	+.040	500	DO-35
26	BZY88C6V8	6.8	5	3.0	20	1.0	3.0	(+.070)	500	DO-35
27	ZPD6,8	6.8	5	8.0	5.0	0.1	3.0	(+.070)	500	DO-35
28	1N4736A	6.8	5	3.5	37	10	4.0	—	1000	DO-41
29	BZX85C6V8	6.8	5	3.5	35	1.0	4.0	+.040	1000	DO-41
30	1N755A	7.5	5	6.0	20	0.1	1.0	+.058	500	DO-35

*Tolerance: All zener diodes are also available in ±1%, ±2%, ±10%, and ±20% tolerances.

DIODES

ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol.* $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Typ (Max)	P_D mW T_A=25°C	Package No.
1	1N958B	7.5	5	5.5	16.5	75	5.7	+.058	500	DO-35
2	1N5236B	7.5	5	6.0	20	3.0	6.0	(+.058)	500	DO-35
3	BZX55C7V5	7.5	5	7.0	5.0	2.0	5.0	+.045	500	DO-35
4	BZY88C7V5	7.5	5	5.0	20	0.5	3.0	(+.079)	500	DO-35
5	ZPD7,5	7.5	5	7.0	5.0	0.1	5.0	(+.070)	500	DO-35
6	1N4737A	7.5	5	4.0	34	10	5.0	—	1000	DO-41
7	BZX85C7V5	7.5	5	3.0	35	1.0	4.5	+.045	1000	DO-41
8	1N756A	8.2	5	8.0	20	0.1	1.0	+.062	500	DO-35
9	1N959B	8.2	5	6.5	15	50	6.2	+.062	500	DO-35
10	1N5237B	8.2	5	8.0	20	3.0	6.5	(+.062)	500	DO-35
11	BZX55C8V2	8.2	5	7.0	5.0	2.0	6.0	+.048	500	DO-35
12	BZY88C8V2	8.2	5	6.0	20	0.4	3.0	(+.073)	500	DO-35
13	ZPD8,2	8.2	5	7.0	5.0	0.1	6.0	(+.070)	500	DO-35
14	1N4738A	8.2	5	4.5	31	10	6.0	—	1000	DO-41
15	BZX85C8V2	8.2	5	5.0	25	1.0	5.0	+.048	1000	DO-41
16	1N5238B	8.7	5	8.0	20	3.0	6.5	(+.065)	500	DO-35
17	1N757A	9.1	5	10	20	0.1	1.0	+.068	500	DO-35
18	1N960B	9.1	5	7.5	14	25	6.9	+.068	500	DO-35
19	1N5239B	9.1	5	10	20	3.0	7.0	(+.068)	500	DO-35
20	BZX55C9V1	9.1	5	10	5.0	2.0	7.0	+.050	500	DO-35
21	BZY88C9V1	9.1	5	7.0	20	0.4	5.0	(+.077)	500	DO-35
22	ZPD9,1	9.1	5	10	5.0	0.1	7.0	(+.080)	500	DO-35
23	1N4739A	9.1	5	5.0	28	10	7.0	—	1000	DO-41
24	BZX85C9V1	9.1	5	5.0	25	1.0	6.5	+.051	1000	DO-41
25	1N758A	10	5	17	20	0.1	1.0	+.075	500	DO-35
26	1N961B	10	5	8.5	12.5	10	7.6	+.072	500	DO-35
27	1N5240B	10	5	17	20	3.0	8.0	(+.075)	500	DO-35
28	BZX55C10	10	5	15	5.0	2.0	7.5	+.055	500	DO-35
29	BZY88C10	10	5	25	5.0	2.5	6.7	(+.072)	500	DO-35
30	ZPD10	10	5	15	5.0	0.1	7.5	(+.080)	500	DO-35

*Tolerance: All zener diodes are also available in ±1%, ±2%, ±10% and ±20% tolerances.

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DIODES

ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol.* $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Typ (Max)	P_D mW T_A=25°C	Package No.
1	**1N4740A**	10	**5**	7.0	25	10	7.6	—	1000	DO-41
2	**BZX85C10**	10	**5**	7.0	25	0.5	7.0	+.055	1000	DO-41
3	**1N962B**	11	5	9.5	11.5	5.0	8.4	+.073	500	DO-35
4	**1N5241B**	11	5	22	20	2.0	8.4	(+.076)	500	DO-35
5	**BZX55C11**	11	5	20	5.0	2.0	8.5	+.060	500	DO-35
6	**BZY88C11**	11	5	35	5.0	2.5	7.37	(+.073)	500	DO-35
7	**ZPD11**	11	5	20	5.0	0.1	8.5	(+.090)	500	DO-35
8	**1N4741A**	11	5	8.0	23	5.0	8.4	—	1000	DO-41
9	**BZX85C11**	11	5	8.0	20	0.5	7.7	+.060	1000	DO-41
10	**1N759A**	12	5	30	20	0.1	1.0	+.077	500	DO-35
11	**1N963B**	12	5	11.5	10.5	5.0	9.1	+.076	500	DO-35
12	**1N5242B**	12	5	30	20	1.0	9.1	(+.077)	500	DO-35
13	**BZX55C12**	12	5	20	5.0	2.0	9.0	+.065	500	DO-35
14	**BZY88C12**	12	5	35	5.0	2.5	8.04	(+.076)	500	DO-35
15	**ZPD12**	12	5	20	5.0	0.1	9.0	(+.090)	500	DO-35
16	**1N4742A**	12	5	9.0	21	5.0	9.1	—	1000	DO-41
17	**BZX85C12**	12	5	9.0	20	0.5	8.4	+.065	1000	DO-41
18	**1N964B**	13	5	13	9.5	5.0	9.9	+.079	500	DO-35
19	**1N5243B**	13	5	13	9.5	0.5	9.9	(+.079)	500	DO-35
20	**BZX55C13**	13	5	26	5.0	2.0	10	+.070	500	DO-35
21	**BZY88C13**	13	5	35	5.0	2.5	8.71	(+.079)	500	DO-35
22	**ZPD13**	13	5	25	5.0	0.1	10	(+.090)	500	DO-35
23	**1N4743A**	13	5	10	19	5.0	9.9	—	1000	DO-41
24	**BZX85C13**	13	5	10	20	0.5	9.1	+.065	1000	DO-41
25	**1N5244B**	14	5	15	9.0	0.1	10	(+.082)	500	DO-35
26	**1N965B**	15	5	16	8.5	5.0	11.4	+.082	500	DO-35
27	**1N5245B**	15	5	16	8.5	0.1	11	(+.082)	500	DO-35
28	**BZX55C15**	15	5	30	5.0	2.0	11	+.070	500	DO-35
29	**BZY88C15**	15	5	40	5.0	2.5	10.05	(+.082)	500	DO-35
30	**ZPD15**	15	5	30	5.0	0.1	11	(+.090)	500	DO-35

*Tolerance: All zener diodes are also available in ±1%, ±2%, ±10% and ±20% tolerances.

DIODES

ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol.* $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Typ (Max)	P_D mW T_A=25°C	Package No.
1	**1N4744A**	15	5	14	17	5.0	11.4	—	1000	DO-41
2	**BZX85C15**	15	5	15	15	0.5	10.5	+.070	1000	DO-41
3	**1N966B**	16	5	17	7.8	5.0	12.2	+.083	500	DO-35
4	**1N5246B**	16	5	17	7.8	0.1	12	(+.083)	500	DO-35
5	**BZX55C16**	16	5	40	5.0	2.0	12	+.075	500	DO-35
6	**BZY88C16**	16	5	45	5.0	2.5	10.72	(+.083)	500	DO-35
7	**ZPD16**	16	5	40	5.0	0.1	12	(+.095)	500	DO-35
8	**1N4745A**	16	5	16	15.5	5.0	12.2	—	1000	DO-41
9	**BZX85C16**	16	5	15	15	0.5	11.0	+.070	1000	DO-41
10	**1N5247B**	17	5	19	7.4	0.1	13	(+.084)	500	DO-35
11	**1N967B**	18	5	21	7.0	5.0	13.7	+.085	500	DO-35
12	**1N5248B**	18	5	21	7.0	0.1	14	(+.085)	500	DO-35
13	**BZX55C18**	18	5	55	5.0	2.0	14	+.075	500	DO-35
14	**BZY88C18**	18	5	50	5.0	2.5	12.06	(+.085)	500	DO-35
15	**ZPD18**	18	5	50	5.0	0.1	14	(+.095)	500	DO-35
16	**1N4746A**	18	5	20	14	5.0	13.7	—	1000	DO-41
17	**BZX85C18**	18	5	20	15	0.5	12.5	+.075	1000	DO-41
18	**1N5249B**	19	5	23	6.6	0.1	14	(+.086)	500	DO-35
19	**1N968B**	20	5	25	6.2	5.0	15.2	+.086	500	DO-35
20	**1N5250B**	20	5	25	6.2	0.1	15	(+.086)	500	DO-35
21	**BZX55C20**	20	5	55	5.0	2.0	15	+.080	500	DO-35
22	**BZY88C20**	20	5	60	5.0	2.5	13.4	(+.086)	500	DO-35
23	**ZPD20**	20	5	50	5.0	0.1	15	(+.100)	500	DO-35
24	**1N4747A**	20	5	22	12.5	5.0	15.2	—	1000	DO-41
25	**BZX85C20**	20	5	24	10	0.5	14	+.075	1000	DO-41
26	**1N969B**	22	5	29	5.6	5.0	16.7	+.087	500	DO-35
27	**1N5251B**	22	5	29	5.6	0.1	17	(+.087)	500	DO-35
28	**BZX55C22**	22	5	55	5.0	2.0	17	+.080	500	DO-35
29	**BZY88C22**	22	5	65	5.0	2.5	14.74	(+.087)	500	DO-35
30	**ZPD22**	22	5	55	5.0	0.1	17	(+.100)	500	DO-35
31	**1N4748A**	22	5	23	11.5	5.0	16.7	—	1000	DO-41

*Tolerance: All zener diodes are also available in ±1%, ±2%, ±10% and ±20% tolerances.

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DIODES

ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol.* $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Typ (Max)	P_D mW T_A=25°C	Package No.
1	BZX85C22	22	5	25	10	0.5	15.5	+.080	1000	DO-41
2	1N970B	24	5	33	5.2	5.0	18.2	+.088	500	DO-35
3	1N5252B	24	5	33	5.2	0.1	18	(+.088)	500	DO-35
4	BZX55C24	24	5	80	5.0	2.0	18	+.085	500	DO-35
5	BZY88C24	24	5	75	5.0	2.5	16.08	(+.088)	500	DO-35
6	ZPD24	24	5	80	5.0	0.1	18	(+.100)	500	DO-35
7	1N4749A	24	5	25	10.5	5.0	18.2	—	1000	DO-41
8	BZX85C24	24	5	25	10	0.5	17	+.080	1000	DO-41
9	1N5253B	25	5	35	5.0	0.1	19	(+.089)	500	DO-35
10	1N971B	27	5	41	4.6	5.0	20.6	+.090	500	DO-35
11	1N5254B	27	5	41	4.6	0.1	21	(+.090)	500	DO-35
12	BZX55C27	27	5	80	5.0	2.0	20	+.085	500	DO-35
13	BZY88C27	27	5	85	5.0	2.5	18.09	(+.090)	500	DO-35
14	ZPD27	27	5	80	5.0	0.1	20	(+.100)	500	DO-35
15	1N4750A	27	5	35	9.5	5.0	20.6	—	1000	DO-41
16	BZX85C27	27	5	30	8.0	0.5	19	+.085	1000	DO-41
17	1N5255B	28	5	44	4.5	0.1	21	(+.091)	500	DO-35
18	1N972B	30	5	49	4.2	5.0	22.8	+.091	500	DO-35
19	1N5256B	30	5	49	4.2	0.1	23	(+.091)	500	DO-35
20	BZX55C30	30	5	80	5.0	2.0	22	+.085	500	DO-35
21	BZY88C30	30	5	95	5.0	2.5	20.1	(+.091)	500	DO-35
22	ZPD30	30	5	80	5.0	0.1	22.5	(+.100)	500	DO-35
23	1N4751A	30	5	40	8.5	5.0	22.8	—	1000	DO-41
24	BZX85C30	30	5	30	8.0	0.5	21	+.085	1000	DO-41
25	1N973B	33	5	58	3.8	5.0	25.1	+.092	500	DO-35
26	1N5257B	33	5	58	3.8	0.1	25	(+.092)	500	DO-35
27	BZX55C33	33	5	80	5.0	2.0	24	+.085	500	DO-35
28	BZY88C33	33	5	120	5.0	2.5	21	(+.100)	500	DO-35
29	ZPD33	33	5	80	5.0	0.1	25	(+.100)	500	DO-35
30	1N4752A	33	5	45	7.5	5.0	25.1	—	1000	DO-41
31	BZX85C33	33	5	35	8.0	0.5	23	+.085	1000	DO-41

*Tolerance: All zener diodes are also available in ±1%, ±2%, ±10% and ±20% tolerances.

DIODES

MILITARY QUALIFIED ZENER DIODES (BY ASCENDING V_Z)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol. $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Max	P_D mW T_A=25°C	Package No.
1	1N747AJAN	3.6	5	22	20	3.0	1.0	-.065	400	DO-7
2	1N747AJANTX	3.6	5	22	20	3.0	1.0	-.065	400	DO-7
3	1N747AJANTXV	3.6	5	22	20	3.0	1.0	-.065	400	DO-7
4	1N748AJAN	3.9	5	20	20	2.0	1.0	-.060	400	DO-7
5	1N748AJANTX	3.9	5	20	20	2.0	1.0	-.060	400	DO-7
6	1N748AJANTXV	3.9	5	20	20	2.0	1.0	-.060	400	DO-7
7	1N749AJAN	4.3	5	18	20	2.0	1.0	-.055	400	DO-7
8	1N749AJANTX	4.3	5	18	20	2.0	1.0	-.055	400	DO-7
9	1N749AJANTX	4.3	5	18	20	2.0	1.0	-.055	400	DO-7
10	1N750AJAN	4.7	5	16	20	5.0	1.5	-.043	400	DO-7
11	1N750AJANTX	4.7	5	16	20	5.0	1.5	-.043	400	DO-7
12	1N750AJANTXV	4.7	5	16	20	5.0	1.5	-.043	400	DO-7
13	1N751AJAN	5.1	5	14	20	5.0	2.0	±.030	400	DO-7
14	1N751AJANTX	5.1	5	14	20	5.0	2.0	±.030	400	DO-7
15	1N751AJANTXV	5.1	5	14	20	5.0	2.0	±.030	400	DO-7
16	1N752AJAN	5.6	5	8.0	20	5.0	2.5	+.032	400	DO-7
17	1N752AJANTX	5.6	5	8.0	20	5.0	2.5	+.032	400	DO-7
18	1N752AJANTXV	5.6	5	8.0	20	5.0	2.5	+.032	400	DO-7
19	1N962BJAN	11	5	9.5	11.5	5.0	8.4	+.073	400	DO-35
20	1N962BJANTX	11	5	9.5	11.5	5.0	8.4	+.073	400	DO-35
21	1N962BJANTXV	11	5	9.5	11.5	5.0	8.4	+.073	400	DO-35
22	1N962B-1JAN	11	5	9.5	11.5	5.0	8.4	+.073	400	DO-35
23	1N962B-1JANTX	11	5	9.5	11.5	5.0	8.4	+.073	400	DO-35
24	1N962B-1JANTXV	11	5	9.5	11.5	5.0	8.4	+.073	400	DO-35
25	1N963BJAN	12	5	11.5	10.5	5.0	9.1	+.076	400	DO-35
26	1N963BJANTX	12	5	11.5	10.5	5.0	9.1	+.076	400	DO-35
27	1N963BJANTXV	12	5	11.5	10.5	5.0	9.1	+.076	400	DO-35
28	1N963B-1JAN	12	5	11.5	10.5	5.0	9.1	+.076	400	DO-35
29	1N963B-1JANTX	12	5	11.5	10.5	5.0	9.1	+.076	400	DO-35
30	1N963B-1JANTXV	12	5	11.5	10.5	5.0	9.1	+.076	400	DO-35
31	1N964BJAN	13	5	13	9.5	5.0	9.9	+.079	400	DO-35
32	1N964BJANTX	13	5	13	9.5	5.0	9.9	+.079	400	DO-35

DIODES

MILITARY QUALIFIED ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol. $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Max	P_D mW T_A=25°C	Package No.
1	1N964BJANTXV	13	5	13	9.5	5.0	9.9	+.079	400	DO-35
2	1N964B-1JAN	13	5	13	9.5	5.0	9.9	+.079	400	DO-35
3	1N964B-1JANTX	13	5	13	9.5	5.0	9.9	+.079	400	DO-35
4	1N964B-1JANTXV	13	5	13	9.5	5.0	9.9	+.079	400	DO-35
5	1N965BJAN	15	5	16	8.5	5.0	11	+.082	400	DO-35
6	1N965BJANTX	15	5	16	8.5	5.0	11	+.082	400	DO-35
7	1N965BJANTXV	15	5	16	8.5	5.0	11	+.082	400	DO-35
8	1N965B-1JAN	15	5	16	8.5	5.0	11	+.082	400	DO-35
9	1N965B-1JANTX	15	5	16	8.5	5.0	11	+.082	400	DO-35
10	1N965B-1JANTXV	15	5	16	8.5	5.0	11	+.082	400	DO-35
11	1N966BJAN	16	5	17	7.8	5.0	12	+.083	400	DO-35
12	1N966BJANTX	16	5	17	7.8	5.0	12	+.083	400	DO-35
13	1N966BJANTXV	16	5	17	7.8	5.0	12	+.083	400	DO-35
14	1N966B-1JAN	16	5	17	7.8	5.0	12	+.083	400	DO-35
15	1N966B-1JANTX	16	5	17	7.8	5.0	12	+.083	400	DO-35
16	1N966B-1JANTXV	16	5	17	7.8	5.0	12	+.083	400	DO-35
17	1N967BJAN	18	5	21	7.0	5.0	14	+.085	400	DO-35
18	1N967BJANTX	18	5	21	7.0	5.0	14	+.085	400	DO-35
19	1N967BJANTXV	18	5	21	7.0	5.0	14	+.085	400	DO-35
20	1N967B-1JAN	18	5	21	7.0	5.0	14	+.085	400	DO-35
21	1N967B-1JANTX	18	5	21	7.0	5.0	14	+.085	400	DO-35
22	1N967B-1JANTXV	18	5	21	7.0	5.0	14	+.085	400	DO-35
23	1N968BJAN	20	5	25	6.2	5.0	15	+.086	400	DO-35
24	1N968BJANTX	20	5	25	6.2	5.0	15	+.086	400	DO-35
25	1N968BJANTXV	20	5	25	6.2	5.0	15	+.086	400	DO-35
26	1N968B-1JAN	20	5	25	6.2	5.0	15	+.086	400	DO-35
27	1N968B-1JANTX	20	5	25	6.2	5.0	15	+.086	400	DO-35
28	1N968B-1JANTXV	20	5	25	6.2	5.0	15	+.086	400	DO-35
29	1N969BJAN	22	5	29	5.6	5.0	17	+.087	400	DO-35
30	1N969BJANTX	22	5	29	5.6	5.0	17	+.087	400	DO-35
31	1N969BJANTXV	22	5	29	5.6	5.0	17	+.087	400	DO-35
32	1N969B-1JAN	22	5	29	5.6	5.0	17	+.087	400	DO-35

DIODES

MILITARY QUALIFIED ZENER DIODES (BY ASCENDING V_Z) (Cont'd)

GLASS PACKAGE

Item	DEVICE NO.	V_Z V Nom	Tol. $\pm V_Z$ %	Z_Z Ω Max	@ I_Z mA	I_R μA Max	@ V_R V	T.C. %/°C Max	P_D mW T_A=25°C	Package No.
1	1N969B-1JANTX	22	5	29	5.6	5.0	17	+.087	400	DO-35
2	1N969B-1JANTXV	22	5	29	5.6	5.0	17	+.087	400	DO-35
3	1N970BJAN	24	5	33	5.2	5.0	18	+.088	400	DO-35
4	1N970BJANTX	24	5	33	5.2	5.0	18	+.088	400	DO-35
5	1N970BJANTXV	24	5	33	5.2	5.0	18	+.088	400	DO-35
6	1N970B-1JAN	24	5	33	5.2	5.0	18	+.088	400	DO-35
7	1N970B-1JANTX	24	5	33	5.2	5.0	18	+.088	400	DO-35
8	1N970B-1JANTXV	24	5	33	5.2	5.0	18	+.088	400	DO-35
9	1N971BJAN	27	5	41	4.6	5.0	21	+.090	400	DO-35
10	1N971BJANTX	27	5	41	4.6	5.0	21	+.090	400	DO-35
11	1N971BJANTXV	27	5	41	4.6	5.0	21	+.090	400	DO-35
12	1N971B-1JAN	27	5	41	4.6	5.0	21	+.090	400	DO-35
13	1N971B-1JANTX	27	5	41	4.6	5.0	21	+.090	400	DO-35
14	1N971B-1JANTXV	27	5	41	4.6	5.0	21	+.090	400	DO-35
15	1N972BJAN	30	5	49	4.2	5.0	23	+.091	400	DO-35
16	1N972BJANTX	30	5	49	4.2	5.0	23	+.091	400	DO-35
17	1N972BJANTXV	30	5	49	4.2	5.0	23	+.091	400	DO-35
18	1N972B-1JAN	30	5	49	4.2	5.0	23	+.091	400	DO-35
19	1N972B-1JANTX	30	5	49	4.2	5.0	23	+.091	400	DO-35
20	1N972B-1JANTXV	30	5	49	4.2	5.0	23	+.091	400	DO-35
21	1N973BJAN	33	5	58	3.8	5.0	25	+.092	400	DO-35
22	1N973BJANTX	33	5	58	3.8	5.0	25	+.092	400	DO-35
23	1N973BJANTXV	33	5	58	3.8	5.0	25	+.092	400	DO-35
24	1N973B-1JAN	33	5	58	3.8	5.0	25	+.092	400	DO-35
25	1N973B-1JANTX	33	5	58	3.8	5.0	25	+.092	400	DO-35
26	1N973B-1JANTXV	33	5	58	3.8	5.0	25	+.092	400	DO-35

DIODES

MATCHED DIODE ASSEMBLIES
PLASTIC AND GLASS PACKAGES

Number of Diodes / Package				2 Moulded Pair (308)	2 Discrete Pair DO-7 or DO-35	4 Moulded Quad (310)	4 Discrete Quad DO-7 or DO-35	4 Moulded Bridge (309)
Item	V_F Matching (-55°C to +100°C) Basic Diode Specification	I_F Range mA	ΔV_F mV	DEVICE NO.	DEVICE NO.	DEVICE NO.	DEVICE NO.	DEVICE NO.
1	**1N914**	0.01-1.0	3.0	FA2310E	FA2310U	FA4310E	FA4310U	FA3310
2	**1N3070**	0.01-1.0	3.0	FA2320E	FA2320U	FA4320E	FA4320U	FA3320
3	**1N3595**	0.01-1.0	10	FA2330E	FA2330U	FA4330E	FA4330U	FA3330
4	—	0.1-10	10	1N4306	—	—	—	—
5	—	0.1-10	10	—	—	1N4307	—	—

MILITARY QUALIFIED DIODE ASSEMBLIES
PLASTIC AND GLASS PACKAGES

Item	DEVICE NO.	BV V Min	I_R nA Max	@ V_R V	V_F V Max	@ I_F mA	C pF Max	t_{rr} ns Max	Package No.
6	**1N4306JAN**	75	50	50	1.0	50	2.0	4.0	308
7	**1N4306JANTX**	75	50	50	1.0	50	2.0	4.0	308
8	**1N4306JANTXV**	75	50	50	1.0	50	2.0	4.0	308
9	**1N4307JAN**	75	50	50	1.0	50	2.0	4.0	310
10	**1N4307JANTX**	75	50	50	1.0	50	2.0	4.0	310
11	**1N4307JANTXV**	75	50	50	1.0	50	2.0	4.0	310

MONOLITHIC DIODE ARRAYS (NUMERIC LISTING)
PLASTIC - CERAMIC - METAL PACKAGES

Item	DEVICE NO.	BV V Min	V_F V Max	@ I_F mA	ΔV_F mV Max	t_{rr} ns Min	Configuration	Package No.
12	**FSA1410M**	60	1.0	100	15	10	CA8	TO-18
13	**FSA1411M**	60	1.0	100	15	10	CC8	TO-18
14	**FSA2002M**	60	1.0	100	15	10	CC8	TO-91
15	**FSA2003M**	60	1.0	100	15	10	CA8	TO-91
16	**FSA2500M**	60	1.0	100	15	10	M16	TO-91
17	**FSA2501M**	60	1.0	100	15	10	M16	TO-116
18	**FSA2501P**	60	1.0	100	15	10	M16	TO-116
19	**FSA2502M**	60	1.0	100	15	10	M16	TO-96

DIODES

MONOLITHIC DIODE ARRAYS (NUMERIC LISTING) (Cont'd)

PLASTIC - CERAMIC - METAL PACKAGES

Item	DEVICE NO.	BV V Min	V_F V Max	@	I_F mA	ΔV_F mV Max	t_{rr} ns Min	Configuration	Package No.
1	**FSA2503M**	60	1.0		100	15	10	2M8	TO-116
2	**FSA2503P**	60	1.0		100	15	10	2M8	TO-116
3	**FSA2504M**	60	1.0		100	15	10	2M8	TO-86
4	**FSA2508M**	60	1.3		500	15	10	4M4	6B
5	**FSA2508P**	60	1.3		500	15	10	4M4	9B
6	**FSA2509M**	60	1.3		500	15	10	2M8	TO-116
7	**FSA2509P**	60	1.3		500	15	10	2M8	TO-116
8	**FSA2510M**	60	1.3		500	15	10	M16	TO-116
9	**FSA2510P**	60	1.3		500	15	10	M16	TO-116
10	**FSA2563M**	60	1.3		500	15	10	CC8	TO-116
11	**FSA2563P**	60	1.3		500	15	10	CC8	TO-116
12	**FSA2564M**	60	1.3		500	15	10	CA8	TO-116
13	**FSA2564P**	60	1.3		500	15	10	CA8	TO-116
14	**FSA2565M**	60	1.3		500	15	10	CC13	TO-116
15	**FSA2565P**	60	1.3		500	15	10	CC13	TO-116
16	**FSA2566M**	60	1.3		500	15	10	CA13	TO-116
17	**FSA2566P**	60	1.3		500	15	10	CA13	TO-116
18	**FSA2619M**	100	1.0		10	15	5	S8	6B
19	**FSA2619P**	100	1.0		10	15	5	S8	9B
20	**FSA2620M**	100	1.0		10	15	5	S7	TO-116
21	**FSA2620P**	100	1.0		10	15	5	S7	TO-116
22	**FSA2621M**	100	1.0		10	15	5	S7	TO-86
23	**FSA2702M**	60	1.0		200	3	6	R4	TO-33
24	**FSA2703M**	60	1.0		200	3	6	R4	TO-72
25	**FSA2704M**	60	1.0		200	—	6	R4	TO-33
26	**FSA2705M**	60	1.0		200	—	6	R4	TO-72
27	**FSA2719M**	75	1.0		10	15	6	S8	6B
28	**FSA2719P**	75	1.0		10	15	6	S8	9B
29	**FSA2720M**	75	1.0		10	15	6	S7	TO-116
30	**FSA2720P**	75	1.0		10	15	6	S7	TO-116
31	**FSA2721**	75	1.0		10	15	6	S7	TO-86

Note: See configurations on following page.

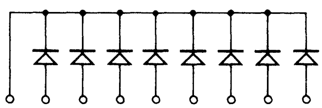
DIODES

MILITARY QUALIFIED DIODE ARRAYS (NUMERIC LISTING)

CERAMIC PACKAGES

Item	DEVICE NO.	BV V Min	V_F V Max	@	I_F mA	t_{fr} ns Max	t_{rr} ns Max	Configuration	Package No.
1	**1N5768JAN**	60	1.0		100	40	20	CC8	TO-91
2	**1N5768JANTX**	60	1.0		100	40	20	CC8	TO-91
3	**1N5768JANTXV**	60	1.0		100	40	20	CC8	TO-91
4	**1N5770JAN**	60	1.0		100	40	20	CA8	TO-91
5	**1N5770JANTX**	60	1.0		100	40	20	CA8	TO-91
6	**1N5770JANTXV**	60	1.0		100	40	20	CA8	TO-91
7	**1N5772JAN**	60	1.0		100	40	20	M16	TO-91
8	**1N5772JANTX**	60	1.0		100	40	20	M16	TO-91
9	**1N5772JANTXV**	60	1.0		100	40	20	M16	TO-91
10	**1N5774JAN**	60	1.0		100	40	20	2M8	TO-86
11	**1N5774JANTX**	60	1.0		100	40	20	2M8	TO-86
12	**1N5774JANTXV**	60	1.0		100	40	20	2M8	TO-86
13	**1N6100JAN**	75	1.0		100	15	5.0	S7	TO-86
14	**1N6100JANTX**	75	1.0		100	15	5.0	S7	TO-86
15	**1N6100JANTXV**	75	1.0		100	15	5.0	S7	TO-86

CONFIGURATIONS



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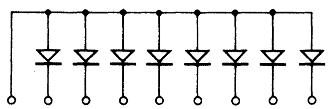

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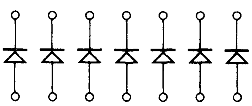

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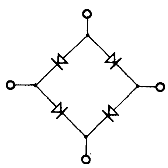

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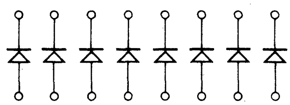

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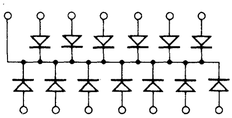

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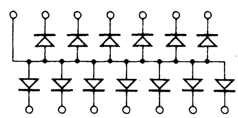

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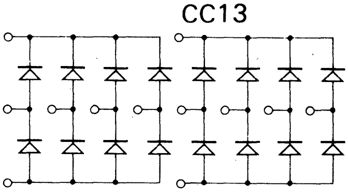

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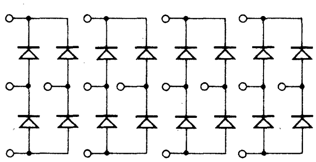

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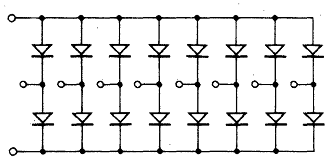

M16

DIODES

DIODE DICE (BY DESCENDING BV)

Item	DEVICE NO.	Basic Standard Device	BV V Min	I_R nA Max	@ V_R V	V_F V Max	@ I_F mA	t_{rr} ns Typ	@ $I_f = I_r$ mA	C pF Max	Chip Size Mils	Basic Application
1	**FDC3070**	1N3070	200	100	175	1.0	100	50	10	2.5	15x15	High Voltage Switching
2	**FDC485B**	1N485B	200	25	175	1.0	100	500	10	5.0	17.5x17.5	High Voltage Low Leakage
3	**FDC3600**	1N3600	75	100	50	1.0	100	4.0	10	2.5	15x15	General Purpose Switching
4	**FDC4376**	1N4376	20	100	10	1.1	50	0.8	10	1.2	17.5x17.5	Ultra High Speed Switching

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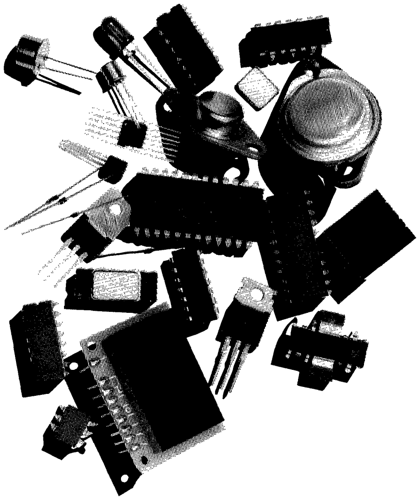
RECTIFIERS

GENERAL PURPOSE RECTIFIERS
GLASS PACKAGE

Item	DEVICE NO.	V_R V Min	@ I_R μA	V_F V Max	@ I_F A	V_{FM} V Max	@ I_O A	Package No.
5	**1N4001**	50	10	1.1	1.0	1.6	1.0	DO-41
6	**1N4002**	100	10	1.1	1.0	1.6	1.0	DO-41
7	**1N4003**	200	10	1.1	1.0	1.6	1.0	DO-41
8	**1N4004**	400	10	1.1	1.0	1.6	1.0	DO-41
9	**1N4005**	600	10	1.1	1.0	1.6	1.0	DO-41

FAST RECOVERY RECTIFIERS
GLASS PACKAGE

Item	DEVICE NO.	V_R V Min	@ I_R μA Max	V_F V Max	@ I_F A	t_{rr} ns Max	Package No.
10	**1N4933**	50	5.0	1.2	1.0	200	DO-41
11	**1N4934**	100	5.0	1.2	1.0	200	DO-41
12	**1N4935**	200	5.0	1.2	1.0	200	DO-41
13	**1N4936**	400	5.0	1.2	1.0	200	DO-41
14	**1N4937**	600	5.0	1.2	1.0	200	DO-41



POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO})

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	$P_{D(Max)}$ W T_C = 25°C	Package No.
I_C = 0.1 A Max Continuous										
1	**BF257**		160	25/-	0.03	1.0	0.03	75	1.0	TO-39
2	**BF336**		180	20/-	0.03	—	—	50	1.0	TO-39
3	**BF337**		200	20/-	0.03	—	—	50	1.0	TO-39
4	**BF338**		225	20/-	0.03	—	—	50	1.0	TO-39
5	**BF258**		250	25/-	0.03	1.0	0.03	75	1.0	TO-39
6	**D40N1F**		250	30/90	0.02	—	—	40	10	Dynawatt
7	**D40N2F**		250	60/180	0.02	—	—	40	10	Dynawatt
8	**BF259**		300	25/-	0.03	1.0	0.03	75	1.0	TO-39
9	**D40N3F**		300	30/90	0.02	—	—	40	10	Dynawatt
10	**D40N4F**		300	60/180	0.02	—	—	40	10	Dynawatt
I_C = 0.15 A Max Continuous										
11	**2N5059**		250	30/150	0.03	1.0	0.03	30	1.0	TO-39
12	**2N5058**		300	35/150	0.03	1.0	0.03	30	1.0	TO-39
I_C = 0.5 A Max Continuous										
13	**TIP61**	**TIP62**	40	40/-	0.05	0.07	0.50	3.0	15	TO-220
14	**TIP61A**	**TIP62A**	60	40/-	0.05	0.07	0.50	3.0	15	TO-220
15	**TIP61B**	**TIP62B**	80	40/-	0.05	0.07	0.50	3.0	15	TO-220
16	**TIP61C**	**TIP62C**	100	40/-	0.05	0.07	0.50	3.0	15	TO-220
17	**SE7055**		220	40/-	0.03	1.00	0.02	50	1.0	TO-39
18	**SE7056**		300	40/-	0.03	1.00	0.02	50	1.0	TO-39
19	**MPS-U10F**		300	40/-	0.03	—	—	40	10	Dynawatt
I_C = 1.0 A Max Continuous										
20	**FT427**		30	20/-	0.50	—	—	—	10	Dynawatt
21	**FT527**		30	20/-	0.50	—	—	—	10	TO-220
22	**D40D1F**	**D41D1F**	30	50/150	0.10	0.5	0.5	—	10	Dynawatt
23	**TIP29**	**TIP30**	40	15/75	1.00	0.7	1.0	3.0	30	TO-220
24		**2N4898**	40	20/100	0.50	0.6	1.0	3.0	25	TO-66
25	**2N4910**		40	20/100	0.50	0.6	1.0	4.0	25	TO-66
26	**D40D4F**	**D41D4F**	45	50/150	0.10	0.5	0.5	—	10	Dynawatt
27	**TIP29A**	**TIP30A**	60	15/75	1.00	0.7	1.0	3.0	30	TO-220
28		**2N3740**	60	30/100	0.25	0.6	1.0	4.0	25	TO-66

POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	$P_{D(Max)}$ W T_C=25° C	Package No.
I_C = 1.0 A Max Continuous (Cont'd)										
1	2N4911		60	20/100	0.50	0.5	1.0	4.0	25	TO-66
2		2N4899	60	20/100	0.50	0.6	1.0	3.0	25	TO-66
3	D40D7F	D41D7F	60	50/150	0.10	0.5	0.5	—	10	Dynawatt
4	D40D10F	D41D10F	75	50/150	0.10	0.5	0.5	—	10	Dynawatt
5	D40D13F	D41D13F	75	50/150	0.10	0.5	0.5	—	10	Dynawatt
6	TIP29B	TIP30B	80	15/75	1.00	0.7	1.0	3.0	30	TO-220
7		2N3741	80	30/100	0.25	0.6	1.0	4.0	25	TO-66
8		2N4900	80	20/100	0.50	0.6	1.0	3.0	25	TO-66
9	2N4912		80	20/100	0.50	0.6	1.0	4.0	25	TO-66
10	TIP29C	TIP30C	100	15/75	1.00	0.7	1.0	3.0	30	TO-220
11	2N5681	2N5679	100	40/150	0.25	1.0	0.5	30	10	TO-39
12	2N5682	2N5680	120	40/150	0.25	1.0	0.5	30	10	TO-39
13		2N5415	200	30/150	0.05	2.5	0.5	15	10	TO-39
14		FTD5415	200	30/150	0.05	2.5	0.05	15	10	Dynawatt
15	FTD3440		250	40/160	0.02	0.5	0.05	15	10	Dynawatt
16	2N3440		250	40/160	0.02	0.5	0.05	15	10	TO-39
17	FT47		250	30/150	0.30	1.0	1.0	10	40	TO-220
18	SE9331		300	30/250	0.10	2.5	0.10	10	20	TO-66
19	FT48		300	30/150	0.30	1.0	1.00	10	40	TO-220
20		2N5416	300	30/120	0.05	2.0	0.05	15	10	TO-39
21		FTD5416	300	30/120	0.05	2.0	0.05	15	10	Dynawatt
22	2N3439		350	40/160	0.02	0.5	0.05	15	10	TO-39
23	FT49		350	30/150	0.30	1.0	1.00	10	40	TO-220
24	FTD3439		350	40/160	0.02	0.5	0.05	15	10	Dynawatt
25	FT50		400	30/150	0.30	1.0	1.00	10	40	TO-220
I_C = 2.0 A Max Continuous										
26	FT428		25	20/-	0.5	—	—	—	10	Dynawatt
27	FT528		25	20/-	0.5	—	—	—	10	TO-220
28	FTD5321	FTD5323	50	40/250	0.5	0.8	0.5	40	10	Dynawatt
29	2N5321	2N5323	50	40/250	0.5	0.8	0.5	50	10	TO-39
30	MPS-U05F	MPS-U55F	60	50/-	0.25	0.5	0.25	40	10	Dynawatt

POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	P_D(Max) W T_C=25° C	Package No.
I_C = 2.0 A Max Continuous (Cont'd)										
1	TIP110*	TIP115*	60	1000/-	1.0	2.5	2.0	—	50	TO-220
2	2N5320	2N5322	75	30/130	0.5	0.5	0.5	50	10	TO-39
3	FTD5320	FTD5322	75	30/130	0.5	0.5	0.5	40	10	Dynawatt
4	MPS-U06F	MPS-U56F	80	50/-	0.25	0.5	0.25	40	10	Dynawatt
5	TIP111*	TIP116*	80	1000/-	1.0	2.5	2.0	—	50	TO-220
6	TIP112*	TIP117*	100	1000/-	1.0	2.5	2.0	—	50	TO-220
7	MPS-U07F	MPS-U57F	100	30/-	0.25	0.05	0.25	40	10	Dynawatt
8	FT401		300	20/100	0.5	0.8	0.5	2.0	100	TO-3
I_C = 3.0 A Max Continuous										
9	TIP31	TIP32	40	10/50	3.0	1.2	3.0	3.0	40	TO-220
10		2N4234	40	30/150	0.25	0.6	1.0	3.0	6.0	TO-39
11		2N4235	60	30/150	0.25	0.6	1.0	3.0	6.0	TO-39
12	2N3766		60	40/160	0.5	1.0	0.5	10	20	TO-66
13	2N5334		60	30/150	1.0	0.7	2.0	40	6.0	TO-39
14	TIP31A	TIP32A	60	10/50	3.0	1.2	3.0	3.0	40	TO-220
15	TIP31B	TIP32B	80	10/50	3.0	1.2	3.0	3.0	40	TO-220
16		2N4236	80	30/150	0.25	0.6	1.0	3.0	6.0	TO-39
17	2N3767		80	40/160	0.5	1.0	0.5	10	20	TO-66
18	2N5335		80	30/150	1.0	0.7	2.0	40	6.0	TO-39
19	TIP31C	TIP32C	100	10/50	3.0	1.2	3.0	3.0	40	TO-220
20	2N5838		250	8/40	3.0	1.0	3.0	5.0	100	TO-3
21	2N5839		275	10/50	2.0	1.5	2.0	5.0	100	TO-3
22	FT402		325	20/100	0.5	2.0	3.0	2.0	100	TO-3
23	2N5840		350	10/50	2.0	1.5	2.0	5.0	100	TO-3
I_C = 4.0 A Max Continuous										
24	2N5296		40	30/120	1.0	1.0	1.0	0.8	36	TO-220
25	BD221	BD224	40	30/120	1.0	1.0	1.0	0.8	36	TO-220
26	2N4231		40	25/100	1.5	0.7	1.5	4.0	35	TO-66
27	2N4237		40	30/150	0.25	0.6	1.0	1.0	6.0	TO-39
28	2N6121	2N6124	45	25/100	1.5	0.6	1.5	2.5	40	TO-220

*Darlington

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POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	$P_{D(Max)}$ W T_C=25° C	Package No.
I_C = 4.0 A Max Continuous (Cont'd)										
1	**2N3054**		55	25/150	0.5	1.0	0.5	—	25	TO-66
2	**2N5298**		60	20/80	1.5	1.0	1.5	0.8	36	TO-220
3	**BD222**	**BD225**	60	20/80	1.5	1.0	1.5	0.8	36	TO-220
4	**2N6122**	**2N6125**	60	25/100	1.5	0.6	1.5	2.5	40	TO-220
5	**2N4232**		60	25/100	1.5	0.7	1.5	4.0	35	TO-66
6	**2N4238**		60	30/150	0.25	0.6	1.0	1.0	6.0	TO-39
7	**2N5294**		70	30/120	0.5	1.0	0.5	0.8	36	TO-220
8	**BD220**	**BD223**	70	30/120	0.5	1.0	0.5	0.8	36	TO-220
9	**2N6123**	**2N6126**	80	20/80	1.5	0.6	1.5	2.5	40	TO-220
10	**2N4233**		80	25/100	1.5	0.7	1.5	4.0	35	TO-66
11	**2N4239**		80	30/150	0.25	0.6	1.0	1.0	6.0	TO-39
12	**FT317**	**FT417**	100	35/-	1.0	0.5	1.0	20	40	TO-220
13	**2N6473**	**2N6475**	100	15/150	1.5	1.2	1.5	10	40	TO-220
14	**FT317A**	**FT417A**	120	35/-	1.0	0.5	1.0	20	40	TO-220
15	**2N6474**	**2N6476**	120	15/150	1.5	1.2	1.5	10	40	TO-220
16	**FT317B**	**FT417B**	140	35/-	1.0	0.5	1.0	20	40	TO-220
I_C = 5.0 A Max Continuous										
17	**2N5067**	**2N4901**	40	20/80	1.0	0.4	1.0	4.0	87.5	TO-3
18	**2N4913**	**2N4904**	40	25/100	2.5	1.5	5.0	4.0	87.5	TO-3
19	**2N5490**		40	20/100	2.0	1.0	2.0	0.8	50	TO-220
20	**2N5494**		40	20/100	3.0	1.0	3.0	0.8	50	TO-220
21	**2N5492**		55	20/100	2.5	1.0	2.5	0.8	50	TO-220
22	**TIP120***	**TIP125***	60	1000/-	0.5	2.0	3.0	—	65	TO-220
23	**BC323**		60	50/250	0.5	0.15	0.5	—	7.0	TO-39
24	**2N5068**	**2N4902**	60	20/80	1.0	0.4	1.0	4.0	87.5	TO-3
25	**2N4895**		60	40/120	2.0	1.0	5.0	50	7.0	TO-39
26	**BFX34**		60	40/150	2.0	1.0	0.5	70	5.0	TO-39
27	**2N4896**		60	100/300	2.0	1.0	5.0	80	7.0	TO-39
28	**2N4914**	**2N4905**	60	25/100	2.5	1.5	5.0	4.0	87.5	TO-3
29	**2N5496**		70	20/100	3.5	1.0	3.5	0.8	50	TO-220

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POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	P_D(Max) W T_C=25°C	Package No.
I_C = 5.0 A Max Continuous (Cont'd)										
1	TIP121*	TIP126*	80	1000/-	0.5	2.0	3.0	—	65	TO-220
2	2N5069	2N4903	80	20/80	1.0	0.4	1.0	4.0	87.5	TO-3
3	2N4897		80	40/120	2.0	1.0	5.0	50	7.0	TO-39
4	2N5336		80	30/120	2.0	0.7	2.0	30	6.0	TO-39
5	2N5337		80	60/240	2.0	0.7	2.0	30	6.0	TO-39
6	2N4915	2N4906	80	25/100	2.5	1.5	5.0	4.0	87.5	TO-3
7	TIP122*	TIP127*	100	1000/-	0.5	2.0	3.0	—	65	TO-220
8	2N5338		100	30/120	2.0	0.7	2.0	30	6.0	TO-39
9	2N5339		100	60/240	2.0	0.7	2.0	30	6.0	TO-39
I_C = 6.0 A Max Continuous										
10	TIP41	TIP42	40	30/-	0.3	1.5	6.0	3.0	65	TO-220
11	TIP41A	TIP42A	60	30/-	0.3	1.5	6.0	3.0	65	TO-220
12	TIP41B	TIP42B	80	30/-	0.3	1.5	6.0	3.0	65	TO-220
13	TIP41C	TIP42C	100	30/-	0.3	1.5	6.0	3.0	65	TO-220
I_C = 7.0 A Max Continuous										
14	2N6111		30	30/150	3.0	1.0	3.0	10	40	TO-220
15	2N6129	2N6132	40	20/100	2.5	1.4	7.0	2.5	50	TO-220
16	2N6109		50	30/150	2.5	1.0	2.5	10	40	TO-220
17	2N5873	2N5871	60	20/100	2.5	1.0	4.0	4.0	115	TO-3
18	2N6130	2N6133	60	20/100	2.5	1.4	7.0	2.5	50	TO-220
19	2N6107		70	30/150	2.0	1.0	2.0	10	40	TO-220
20	2N5874	2N5872	80	20/100	2.5	1.0	4.0	4.0	115	TO-3
21	2N6131	2N6134	80	20/100	2.5	2.8	7.0	2.5	50	TO-220
I_C = 7.5 A Max Continuous										
22	FT410		200	30/90	1.0	0.8	1.0	(5.0)	100	TO-3
23	FT411		300	30/90	1.0	0.8	1.0	(5.0)	100	TO-3
24	FT413		325	20/80	0.5	0.8	0.5	(5.0)	100	TO-3
25	FT423		325	30/90	1.0	0.8	1.0	(5.0)	100	TO-3
I_C = 8.0 A Max Continuous										
26	2N5877	2N5875	60	20/100	4.0	1.0	5.0	4.0	150	TO-3

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POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	P_D(Max) W T_C=25° C	Package No.
I_C = 8.0 A Max Continuous (Cont'd)										
1	2N6055*	2N6053*	60	750/18K	4.0	2.0	4.0	4.0	100	TO-3
2	2N5878	2N5876	80	20/100	4.0	1.0	5.0	4.0	150	TO-3
3	2N6056*	2N6054*	80	750/18K	4.0	2.0	4.0	4.0	100	TO-3
4	2N6306		250	15/75	3.0	0.8	3.0	5.0	125	TO-3
5	2N6307M		300	15/75	3.0	1.0	3.0	5.0	125	TO-3
6	2N6308M		350	12/60	3.0	1.5	3.0	5.0	125	TO-3
I_C = 10.0 A Max Continuous										
7	2N6103		40	15/60	8.0	2.5	16	—	75	TO-220
8	2N6386*		40	1K/20K	3.0	2.0	3.0	20	40	TO-220
9		2N4907	40	20/80	4.0	0.75	4.0	4.0	150	TO-3
10	2N6383*		40	1K/20K	5.0	2.0	5.0	20	100	TO-3
11	2N3713		60	25/75	1.0	1.0	5.0	4.0	150	TO-3
12		2N3789	60	25/90	1.0	1.0	5.0	4.0	150	TO-3
13	2N6099		60	20/80	4.0	2.5	10	—	75	TO-220
14	2N3715		60	50/150	1.0	0.8	5.0	4.0	150	TO-3
15		2N3791	60	50/180	1.0	1.0	5.0	4.0	150	TO-3
16	2N6387*		60	1K/20K	3.0	2.0	3.0	20	40	TO-220
17	MJE3055F		60	20/70	4.0	1.1	4.0	2.0	70	TO-220
18		2N4908	60	20/80	4.0	0.75	4.0	4.0	150	TO-3
19	SE9300*	SE9400*	60	1000/-	4.0	2.0	4.0	1.0	70	TO-220
20	SE9303*	SE9403*	60	1000/-	4.0	2.0	4.0	1.0	100	TO-3
21	2N6384*		60	1K/20K	5.0	2.0	5.0	20	100	TO-3
22	MJ2500*	MJ3000*	60	1000/-	5.0	2.0	10	—	150	TO-3
23	2N6101		70	20/80	5.0	2.5	10	—	75	TO-220
24	2N3714		80	25/75	1.0	1.0	5.0	4.0	150	TO-3
25		2N3790	80	25/90	1.0	1.0	5.0	4.0	150	TO-3
26	2N3716		80	50/150	1.0	0.8	5.0	4.0	150	TO-3
27		2N3792	80	50/180	1.0	1.0	5.0	4.0	150	TO-3
28	2N6388*		80	1K/20K	3.0	2.0	3.0	20	40	TO-220
29		2N4909	80	20/80	4.0	0.75	4.0	4.0	150	TO-3

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POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	$P_{D(Max)}$ W T_C=25° C	Package No.
I_C = 10.0 A Max Continuous (Cont'd)										
1	**SE9304***	**SE9404***	80	1K/-	4.0	2.0	4.0	1.0	100	TO-3
2	**SE9301***	**SE9401***	80	1K/-	4.0	2.0	4.0	1.0	70	TO-220
3	**2N6385***		80	1K/20K	5.0	2.0	5.0	20	100	TO-3
4	**MJ2501**	**MJ3001**	80	1000/-	5.0	2.0	10		150	TO-3
5	**SE9302***	**SE9402***	100	1K/-	4.0	2.0	1.0		70	TO-220
6	**SE9305***	**SE9405***	100	1K/-	4.0	2.0	40	1.0	100	TO-3
7	**2N6249**		200	10/50	10	1.5	10	2.5	100	TO-3
8	**2N6250**		275	8/50	10	1.5	10	2.5	100	TO-3
9	**FT430**		300	15/45	2.5	0.9	2.5	—	125	TO-3
10	**FT160**		300	55/-	4.0	1.9	5.0	—	70	TO-220
11	**FT431**		325	15/35	2.5	0.7	2.5	—	125	TO-3
12	**FT161**		330	55/-	4.0	1.9	5.0	—	70	TO-220
13	**FT162**		350	55/-	4,0	1.9	5.0	—	70	TO-220
14	**FT359***		350	250/-	3.0	2.8	7.0	—	125	TO-3
15	**2N6251**		350	6/50	10	1.5	10	2.5	100	TO-3
I_C = 12.0 A Max Continuous										
16	**2N6569**		40	15/200	0.2	1.5	4.0	1.5	100	TO-3
17	**2N6057***	**2N6050***	60	750/18K	6.0	2.0	6.0	4.0	150	TO-3
18	**2N5881**	**2N5879**	60	20/100	6.0	1.0	7.0	4.0	160	TO-3
19	**2N5882**	**2N5880**	80	20/100	6.0	1.0	7.0	4.0	160	TO-3
20	**2N6058***	**2N6051***	80	750/18K	6.0	2.0	6.0	4.0	150	TO-3
21	**2N6059***	**2N6052***	100	750/18K	6.0	2.0	6.0	4.0	150	TO-3
I_C = 15.0 A Max Continuous										
22	**2N6486**	**2N6489**	40	20/150	5.0	1.3	5.0	5.0	75	TO-220
23	**MJ2955**		60	20/70	4.0	1.1	4.0	4.0	150	TO-3
24	**2N6576***		60	2K/20K	4.0	4.0	15	10	120	TO-3
25	**2N3055SD**		60	20/70	4.0	1.1	4.0	0.8	115	TO-3
26	**FT3055**	**FT2955**	60	20/70	4.0	1.1	4.0	2.0	70	TO-220
27	**2N3055**		60	20/70	4.0	1.1	4.0	—	117	TO-3
28	**2N6487**	**2N6490**	60	20/150	5.0	1.3	5.0	5.0	75	TO-220

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POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	$P_{D(Max)}$ W T_C=25° C	Package No.
I_C = 15.0 A Max Continuous (Cont'd)										
1	**2N6488**	**2N6491**	80	20/150	5.0	1.3	5.0	5.0	75	TO-220
2	**2N6577***		90	2K/20K	4.0	4.0	15	10	120	TO-3
I_C = 16.0 A Max Continuous										
3	**2N5629**		100	25/100	8.0	1.0	10	0.5	200	TO-3
4		**2N6029**	100	25/100	8.0	2.0	16	1.0	200	TO-3
5	**2N5630**		120	20/80	8.0	1.0	10	0.5	200	TO-3
6		**2N6030**	120	20/80	8.0	2.0	16	1.0	200	TO-3
7	**2N5631**		140	15/60	8.0	1.0	10	0.5	200	TO-3
8		**2N6031**	140	15/60	8.0	2.0	16	1.0	200	TO-3
I_C = 20.0 A Max Continuous										
9	**2N3772**		60	15/60	10	1.4	10	0.2	150	TO-3
10	**2N5885**	**2N5883**	60	20/100	10	1.0	15	4.0	200	TO-3
11	**2N6282***	**2N6285***	60	750/18K	10	2.0	10	4.0	160	TO-3
12	**2N5039**		75	20/100	10	1.0	10	60	140	TO-3
13	**2N6283***	**2N6286***	80	750/18K	10	2.0	10	4.0	160	TO-3
14	**2N5886**	**2N5884**	80	20/100	10	1.0	15	4.0	200	TO-3
15	**2N5303**		80	15/60	10	2.0	20	2.0	200	TO-3
16	**2N5038**		90	20/100	12	1.0	12	60	140	TO-3
17	**2N6284***	**2N6287***	100	750/18K	10	2.0	10	4.0	160	TO-3
I_C = 30.0 A Max Continuous										
18	**2N3771**		40	15/60	15	2.0	15	0.2	150	TO-3
19		**2N4398**	40	15/60	15	1.0	15	4.0	200	TO-3
20	**2N5301**		40	15/60	15	2.0	20	2.0	200	TO-3
21		**2N4399**	60	15/60	15	1.0	15	4.0	200	TO-3
22	**2N5302**		60	15/60	15	2.0	20	2.0	200	TO-3
23	**SE9306**	**SE9406**	60	1000/-	10	2.0	10	4.0	160	TO-3
24	**SE9307**	**SE9407**	80	1000/-	10	2.0	10	4.0	160	TO-3
25	**MJ802**	**MJ4502**	90	25/100	7.5	0.8	7.5	2.0	200	TO-3
26	**SE9308**	**SE9408**	100	1000/-	10	2.0	10	4.0	160	TO-3

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POWER

POWER TRANSISTORS (BY $I_C$max, POLARITY AND ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	$V_{CE(sat)}$ V Max	@ I_C A	f_T MHz Min(Typ)	P_D(Max) W T_C=25° C	Package No.
I_C = 50.0 A Max Continuous (Cont'd)										
1	**2N5685**	**2N5683**	60	15/60	25	1.0	25	2.0	300	TO-3
2	**2N5686**	**2N5684**	80	15/60	25	1.0	25	2.0	300	TO-3

POWER SWITCHING TRANSISTORS (BY $I_C$max, POLARITY)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	Switching Times (Typ) t_{on} μs	t_s μs	t_f μs	@I_C A	P_D W T_C=25°C	Package No.
I_C Max = 1.0 A											
3	**2N3440**		250	40/160	0.2	0.07	2.2	0.35	0.1	10	TO-39
4	**FT47**		250	30/150	0.3	0.08	1.8	0.4	1.0	40	TO-220
5	**FT48**		300	30/150	0.3	0.08	1.8	0.4	1.0	40	TO-220
6	**FT49**		350	30/150	0.3	0.08	1.8	0.4	1.0	40	TO-220
7	**FT50**		400	30/150	0.3	0.08	1.8	0.4	1.0	40	TO-220
I_C Max = 3.0 A											
8	**2N5839**		275	10/50	2.0	0.45	3.0	0.3	2.0	100	TO-3
9	**2N5840**		350	10/50	2.0	0.45	3.0	0.3	2.0	100	TO-3
I_C Max = 10 A											
10	**2N3716**		80	50/150	1.0	0.4	.8	0.4	5.0	150	TO-3
11	**FT430**		300	115/45	2.5	0.5	2.6	0.3	2.5	125	TO-3
12	**FT431**		325	15/35	2.5	0.5	2.6	0.3	2.5	125	TO-3
13	**2N6249**		200	10/50	10	0.5	1.0	0.4	10	175	TO-3
14	**2N6250**		275	8/50	10	0.5	1.0	0.4	10	175	TO-3
15	**2N6251**		350	6/50	10	0.5	1.0	0.4	10	175	TO-3
16	**FT3055**	**FT2955**	60	20/70	4.0	.65/.35	.5/.25	.4/.15	10	70	TO-220
17	**2N6386***		40	1K/20K	3.0	0.8	4.0	5.0	3.0	40	TO-220
18	**2N6387***		60	1K/20K	5.0	0.8	3.5	5.0	5.0	40	TO-220
19	**2N6388***		80	1K/20K	5.0	0.8	3.5	5.0	5.0	40	TO-220

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POWER

POWER SWITCHING TRANSISTORS (BY I_C max, POLARITY) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Max	h_{FE} Min/Max	@ I_C A	Switching Times t_{on} µs Typ	t_s µs Typ	t_f µs Typ	@I_C A Typ	P_D W T_C=25°C	Package No.
I_C Max = 20 A											
1	2N5038		90	20/100	10	0.30	0.75	0.15	10	140	TO-3
2	2N6282[1]	2N6285[1]	60	750/18K	10	.8/.6	3.3/2.5	4/1.5	10	160	TO-3
3	2N6283[1]	2N6286[1]	80	750/18K	10	.8/.6	3.3/2.5	4/1.5	10	160	TO-3
4	2N6284[1]	2N6287[1]	100	750/18K	10	.8/.6	3.3/2.5	4/1.5	10	160	TO-3
I_C Max = 30 A											
5	2N5301	2N4398	40	15/60	15	.35/.3	1.2/.7	.5/.4	10	200	TO-3

POWER GROOVE MOS TRANSISTORS

Item	DEVICE NO. N-Channel	P-Channel	V_{DS} V Max	V_{DG} V Max	I_{GF} mA Max	I_D A Max	g_{fs} mV Min	Switching Times[2] $t_{d(on)}$ ns Max	t_r ns Max	$t_{d(off)}$ ns Max	t_f ns Max	P_D W Max	Package No.
6	VN46AF		40	40	2.0	2.0	170	5.0	5.0	5.0	5.0	12.5	Dynawatt
7	VN66AF		60	60	2.0	2.0	170	5.0	5.0	5.0	5.0	12.5	Dynawatt
8	2N6657		60	60	2.0	2.0	170	5.0	5.0	5.0	5.0	25	TO-3
9	FVN2		60	60	2.0	2.0	100	10	10	10	10	6.25	TO-39
10		FVP1	60	60	2.0	2.0	150	10	10	10	10	25	TO-3
11		FVP2	60	60	2.0	1.5	100	10	10	10	10	6.25	TO-39
12	VN88AF		80	80	2.0	2.0	170	5.0	5.0	5.0	5.0	12.5	Dynawatt
13	2N6658		90	90	2.0	2.0	170	5.0	5.0	5.0	5.0	25	TO-3
14	2N6661		90	90	2.0	2.0	170	5.0	5.0	5.0	5.0	6.25	TO-39

1. Darlington
2. $I_D = 1A$, $R_L = 25\Omega$

SMALL SIGNAL

HIGH SPEED SWITCHING TRANSISTORS (BY ASCENDING V_{CEO})

(FOR MEDIUM SPEED—SEE GENERAL PURPOSE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	t_s (t_{off}) ns Max	@ I_C mA	h_{FE} Min/Max	@ I_C mA	V_{CE} (sat) V Max	@ I_C mA	f_T MHz Min	C_{ob} pF Max	P_D T_A 25°C mW	P_D T_C 25°C W	Package No.
1		2N5228	5.0	(140)	10	30/-	10	0.40	10	300	5.0	625	1.0	TO-92
2		2N3639	6.0	30	10	30/120	10	0.16	10	500	3.5	200	0.5	TO-106
3	2N5134		10	18	10	20/150	10	0.25	10	250	4.0	200	0.5	TO-106
4	2N4274		12	13	10	35/120	10	0.20	10	400	4.0	280	0.83	TO-106
5	2N5224		12	(60)	10	40/400	10	0.35	10	250	4.0	625	1.0	TO-92
6		2N4258A	12	15	10	30/120	10	0.15	10	700	3.0	200	0.5	TO-106
7		2N4208	12	20	10	30/120	10	0.15	10	700	3.0	350	0.7	TO-18
8		2N4258	12	20	10	30/120	10	0.15	10	700	3.0	200	0.5	TO-106
9		PN4258	12	20	10	30/120	10	0.15	10	700	3.0	625	1.0	TO-92
10		2N4313	12	20	10	30/120	30	0.19	30	700	4.5	200	0.5	TO-106
11		PN3640	12	(35)	50	30/120	10	0.20	10	500	3.5	625	1.0	TO-92
12		2N3640	12	50	10	30/120	10	0.20	10	500	3.5	200	0.5	TO-106
13		2N2894	12	(90)	30	30/150	30	0.20	30	400	6.0	360	1.2	TO-18
14		BSX29	12	(90)	30	30/120	30	0.20	30	400	6.0	360	1.2	TO-18
15		2N4209	15	20	10	50/120	10	0.18	10	850	3.0	350	0.7	TO-18
16		2N5771	15	20	10	50/120	10	0.15	10	850	3.0	625	1.0	TO-92
17	2N4275		15	13	10	35/120	10	0.20	10	400	4.0	280	0.83	TO-106
18	2N2369		15	13	10	40/120	10	0.25	10	500	4.0	360	1.2	TO-18
19	PN2369		15	13	10	40/120	10	0.25	10	500	4.0	625	1.0	TO-92
20	2N2369A		15	13	10	40/120	10	0.20	10	500	4.0	360	1.2	TO-18
21	2N5769		15	13	10	40/120	10	0.20	10	500	4.0	625	1.0	TO-92
22	BSX26		15	13	10	40/120	10	0.25	10	500	4.0	360	1.2	TO-18
23	2N3009		15	18	10	30/120	30	0.18	30	350	5.0	360	1.2	TO-52
24	2N3013		15	18	10	30/120	30	0.18	30	350	5.0	360	1.2	TO-52
25	2N3646		15	18	10	30/120	30	0.20	30	350	5.0	200	0.5	TO-106
26	MPS3646		15	18	10	30/120	30	0.20	30	350	5.0	625	1.0	TO-92
27	2N5772		15	18	10	30/120	30	0.20	30	350	5.0	625	1.0	TO-92
28	BSX20		15	18	10	30/120	30	0.18	30	350	5.0	360	1.2	TO-18
29	2N914		15	20	20	30/120	10	0.25	20	300	6.0	360	1.2	TO-18
30	2N708		15	25	10	30/120	10	0.40	10	300	6.0	360	1.2	TO-18
31	2N3014		20	18	10	30/120	30	0.18	30	350	5.0	360	1.2	TO-52
32	BSX39		20	18	10	40/120	30	0.18	30	350	6.0	360	1.2	TO-18

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SMALL SIGNAL

HIGH SPEED SWITCHING TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

(FOR MEDIUM SPEED—SEE GENERAL PURPOSE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	t_s (t_{off}) ns Max	@ I_C mA	h_{FE} Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	f_T MHz Min	C_{ob} pF Max	P_D T_A 25°C mW	T_C 25°C W	Package No.
1		2N5910	20	20	10	30/120	10	0.15	10	700	3.0	200	0.5	TO-106
2		2N3209	20	(90)	30	30/120	30	0.20	30	400	5.0	360	1.2	TO-18
3		2N5023	30	(90)	500	40/100	500	0.35	500	200	25	1000	4.0	TO-39
4	2N3724		30	(60)	500	60/150	100	0.20	100	300	12	800	3.5	TO-39
5	2N4013		30	(60)	500	60/150	100	0.20	100	300	12	360	1.2	TO-18
6	BSX32		40	(60)	500	60/150	100	0.25	100	300	10	800	3.5	TO-39
7	2N3253		40	(70)	500	25/-	150	0.35	150	175	12	1000	5.0	TO-39
8		2N3467	40	(90)	500	40/120	500	0.50	500	175	25	1000	5.0	TO-39
9		2N5022	50	(90)	500	25/100	500	0.40	500	170	25	1000	4.0	TO-39
10		2N3468	50	(90)	500	25/75	500	0.60	500	150	25	1000	5.0	TO-39
11	2N4047		50	(60)	500	40/150	100	0.26	100	250	10	800	3.5	TO-39
12	2N3725		50	(60)	500	60/150	100	0.26	100	300	10	800	3.5	TO-39
13	2N4014		50	(60)	500	60/150	100	0.26	100	300	10	360	1.2	TO-18
14	2N3444		50	(70)	500	20/60	500	0.60	500	150	12	1000	5.0	TO-39

GENERAL PURPOSE AMPLIFIER AND SWITCHING TRANSISTORS (BY ASCENDING V_{CEO})

(ALSO SEE LOW LEVEL AND HIGH VOLTAGE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	h_{FE} (h_{fe}) Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	C_{ob} pF Max	f_T MHz Min	t_{off} ns Max	P_D T_C 25°C mW	T_A 25°C W	Package No.
15	2N5128		12	35/350	50	0.25	150	10	200	—	300	0.70	TO-105
16		PN5139	20	-/30	10	0.20	10	5.0	300	—	625	1.0	TO-92
17		2N5142	20	-/30	50	0.50	50	30	100	200	300	0.70	TO-105
18		MPS6563	20	50/200	350	0.50	350	30	60	—	625	1.0	TO-92
19	2N5223		20	50/800	2.0	0.70	2.0	4.0	150	—	625	—	TO-92
20	2N5136		20	20/400	150	0.25	150	35	40	—	220	0.60	TO-105
21	BFY52		20	60/-	150	0.35	150	12	200	—	800	2.86	TO-39
22	MPS6561		20	50/200	350	0.50	150	30	60	—	625	1.0	TO-92
23	MPS6515		25	250/500	2.0	0.50	2.0	3.5	—	—	625	1.0	TO-92
24	MPS2925		25	(235/470)	2.0	—	—	12	—	—	625	1.0	TO-92
25	MPS3392		25	150/300	2.0	—	—	3.5	—	—	625	1.0	TO-92
26	MPS6514		25	150/300	2.0	0.50	2.0	3.5	—	—	625	1.0	TO-92

SMALL SIGNAL

GENERAL PURPOSE AMPLIFIER AND SWITCHING TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

(ALSO SEE LOW LEVEL AND HIGH VOLTAGE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	h_{FE} (h_{fe}) Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	C_{ob} pF Max	f_T MHz Min	t_{off} ns Max	P_D T_A 25°C mW	T_C 25°C W	Package No.
1	**MPS2924**		25	(150/300)	2.0	—	—	12	—	—	625	1.0	TO-92
2	**2N4124**		25	120/360	2.0	0.30	2.0	4.0	300	—	625	—	TO-92
3	**MPS3393**		25	90/180	2.0	—	—	3.5	—	—	625	1.0	TO-92
4	**EN5172**		25	100/500	10	0.25	10	12	—	—	200	0.50	TO-106
5	**MPS5172**		25	100/500	10	0.25	10	12	—	—	625	1.0	TO-92
6	**2N5135**		25	50/600	10	1.00	100	25	40	—	300	0.80	TO-105
7	**2N5225**	**2N5226**	25	30/600	50	0.80	50	20	50	—	625	—	TO-92
8	**BC738**	**BC728**	25	40/250	100	0.5	1000	45	100	—	1120	3.4	TO-92
9	**BC738-6**	**BC728-6**	25	40/100	100	0.5	1000	45	100	—	1120	3.4	TO-92
10	**BC738-10**	**BC728-10**	25	63/163	100	0.5	1000	45	100	—	1120	3.4	TO-92
11	**PE8050**	**PE8550**	25	65/200	100	0.5	1000	45	100	—	1120	3.4	TO-92
12	**BC738-16**	**BC728-16**	25	100/250	100	0.5	1000	45	100	—	1120	3.4	TO-92
13	**MPS6560**		25	50/200	500	0.50	500	30	60	—	625	1.0	TO-92
14		**MPS6519**	25	250/500	2.0	0.50	2.0	4.0	—	—	625	1.0	TO-92
15		**2N4126**	25	120/360	2.0	0.40	2.0	4.5	250	—	625	—	TO-92
16		**PN6076**	25	100/500	10	0.25	10	15	—	—	721	1.47	TO-92
17		**BCY72**	25	-/50	10	0.25	10	6.0	200	—	360	1.2	TO-18
18		**2N3638**	25	-/30	50	0.25	50	20	100	170	300	0.7	TO-105
19		**MPS3702**	25	60/300	50	0.25	50	12	100	—	625	1.0	TO-92
20		**2N3638A**	25	-/100	50	0.25	50	10	150	170	300	0.7	TO-105
21		**MPS3638A**	25	-/100	50	0.25	50	10	150	170	625	1.0	TO-92
22		**MPS6562**	25	50/200	500	0.50	500	30	60	—	625	1.0	TO-92
23	**2N718**		28	40/120	150	1.50	150	35	50	—	400	1.5	TO-18
24	**2N4123**		30	50/150	2.0	0.30	2.0	4.0	250	—	625	—	TO-92
25	**2N3566**		30	50/160	10	1.00	100	25	40	—	300	0.80	TO-105
26	**MPS3704**		30	100/300	50	0.60	50	12	100	—	625	1.0	TO-92
27	**BFY51**		30	40/-	150	0.35	150	12	50	—	800	2.86	TO-39
28	**BC119**		30	40/120	150	0.35	150	25	40	—	800	5.0	TO-39
29	**2N2218**		30	40/120	150	0.40	150	8.0	250	—	800	3.0	TO-39
30	**2N2221**		30	40/120	150	0.40	150	8.0	250	—	500	1.8	TO-18

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SMALL SIGNAL

GENERAL PURPOSE AMPLIFIER AND SWITCHING TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

(ALSO SEE LOW LEVEL AND HIGH VOLTAGE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	h_{FE} (h_{fe}) Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	C_{ob} pF Max	f_T MHz Min	t_{off} ns Max	P_D T_A 25°C mW	T_C 25°C W	Package No.
1	2N3641		30	40/120	150	0.22	150	8.0	250	—	350	0.70	TO-105
2	2N3300		30	100/300	150	0.22	150	8.0	250	150	800	3.0	TO-39
3	2N3302		30	100/300	150	0.22	150	8.0	250	150	360	1.80	TO-18
4	2N2219		30	100/300	150	0.40	150	8.0	250	—	800	3.0	TO-39
5	2N2222		30	100/300	150	0.40	150	8.0	250	—	500	1.8	TO-18
6	2N3643		30	100/300	150	0.22	150	8.0	250	—	350	0.70	TO-105
7	PN3643		30	100/300	150	0.22	150	8.0	250	—	625	1.0	TO-92
8		2N4125	30	50/150	2.0	0.40	2.0	4.5	200	—	625	—	TO-92
9		2N5227	30	50/700	2.0	0.40	2.0	5.0	100	—	625	—	TO-92
10		PN4916	30	70/200	10	0.14	10	4.5	400	150	625	1.0	TO-92
11		PN4917	30	150/300	10	0.14	10	4.5	200	150	625	1.0	TO-92
12		MPS3703	30	30/150	50	0.25	50	12	100	—	625	1.0	TO-92
13		BC126	30	30/120	150	0.50	150	—	—	—	300	0.8	TO-105
14	BC737-6	BC727-6	35	40/100	100	0.75	1000	45	100	—	1120	3.4	TO-92
15		PE8551	35	40/180	100	0.5	1000	45	100	—	1120	3.4	TO-92
16	BC737	BC727	35	40/250	100	0.75	1000	45	100	—	1120	3.4	TO-92
17	BC737-10	BC727-10	35	63/160	100	0.75	1000	45	100	—	1120	2.4	TO-92
18	BC737-16	BC727-16	35	100/200	100	0.75	1000	45	100	—	1120	2.4	TO-92
19		2N1132	35	30/90	150	1.50	150	45	60	—	600	2.0	TO-39
20	PE8051		35	40/180	100	.75	1000	45	100	—	1120	3.4	TO-92
21	BFY50		35	30/-	150	0.20	150	12	50	—	800	2.86	TO-39
22	MPSA10		40	40/400	5.0	—	—	4.0	50	—	625	1.0	TO-92
23	MPSA20	MPSA70	40	40/400	5.0	0.25	5.0	4.0	125	—	625	1.0	TO-92
24	2N3903		40	50/150	10	0.20	10	4.0	250	225	625	—	TO-92
25	2N3904		40	100/300	10	0.20	10	4.0	300	225	625	—	TO-92
26	2N3947		40	100/300	10	0.20	10	4.0	300	450	360	1.2	TO-18
27	BC140	BC160	40	40/400	100	1.40	1000	25	50	—	800	5.0	TO-39
28	BC140-6	BC160-6	40	40/100	100	1.40	1000	25	50	—	800	5.0	TO-39
29	MPS6530		40	40/120	100	0.50	100	5.0	—	—	625	1.0	TO-92
30	BC140-10	BC160-10	40	63/160	100	1.40	1000	25	50	—	800	5.0	TO-39

SMALL SIGNAL

GENERAL PURPOSE AMPLIFIER AND SWITCHING TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

(ALSO SEE LOW LEVEL AND HIGH VOLTAGE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	h_{FE} (h_{fe}) Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	C_{ob} pF Max	f_T MHz Min	t_{off} ns Max	P_D T_A 25°C mW	P_D T_C 25°C W	Package No.
1	MPS6531	MPS6534M	40	90/270	100	0.30	100	5.0	—	—	625	1.0	TO-92
2	BC140-16	BC160-16	40	100/250	100	1.40	1000	25	60	800	800	5.0	TO-39
3	BC140-25	BC160-25	40	160/400	100	1.40	1000	25	50	—	800	5.0	TO-39
4	2N3567		40	40/120	150	0.25	150	20	60	—	300	0.8	TO-105
5	PN3567		40	40/120	150	0.25	150	20	60	—	625	1.0	TO-92
6	2N2218A		40	40/120	150	0.30	150	8.0	250	285	800	3.0	TO-39
7	2N2221A		40	40/120	150	0.30	150	8.0	250	285	500	1.8	TO-18
8	2N4400		40	50/150	150	0.40	150	6.5	200	255	625	—	TO-92
9	2N697		(40)	40/120	150	1.50	150	35	50	—	600	2.0	TO-39
10	2N3569		40	100/300	150	0.25	150	20	60	—	300	0.8	TO-105
11	2N2219A		40	100/300	150	0.30	150	8.0	300	285	800	3.0	TO-39
12	PN2219A		40	100/300	150	0.30	150	8.0	300	285	625	1.0	TO-92
13	2N2222A		40	100/300	150	0.30	150	8.0	300	285	500	1.8	TO-18
14	PN2222A		40	100/300	150	0.30	150	8.0	300	285	625	1.0	TO-92
15	2N4401		40	100/300	150	0.40	150	6.5	250	225	625	—	TO-92
16		MPS6516	40	50/100	2.0	0.50	2.0	4.0	—	—	625	1.0	TO-92
17		BCY70	40	50/-	10	0.25	10	6.0	200	—	360	1.2	TO-18
18		2N3250	40	50/150	10	0.25	10	6.0	250	225	360	1.2	TO-18
19		2N3905	40	50/150	10	0.25	10	4.5	200	260	625	—	TO-92
20		BFY64	40	80/-	10	0.30	50	10	200	120	700	3.0	TO-39
21		2N3251	40	100/300	10	0.25	10	6.0	300	250	360	1.2	TO-18
22		PN3251	40	100/300	10	0.25	10	6.0	250	225	625	1.0	TO-92
23		2N3906	40	100/300	10	0.25	10	4.5	250	300	625	—	TO-92
24		2N2904	40	40/120	150	0.40	150	8.0	200	110	600	3.0	TO-39
25		PN2906	40	40/120	150	0.40	150	8.0	200	110	625	1.0	TO-92
26		2N4402	40	50/150	150	0.40	150	8.5	150	255	625	—	TO-92
27		2N4037	40	50/250	150	1.40	150	—	60	—	1000	—	TO-39
28		BC116A	40	80/240	150	0.40	150	8.0	130	—	300	0.8	TO-39
29		2N2905	40	100/300	150	0.40	150	8.0	200	110	600	3.0	TO-39
30		2N2907	40	100/300	150	0.40	150	8.0	200	110	400	1.8	TO-18

SMALL SIGNAL

GENERAL PURPOSE AMPLIFIER AND SWITCHING TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

(ALSO SEE LOW LEVEL AND HIGH VOLTAGE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	h_{FE} (h_{fe}) Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	C_{ob} pF Max	f_T MHz Min	t_{off} ns Max	P_D T_A 25°C mW	T_C 25°C W	Package No.
1		2N4403	40	100/300	150	0.40	150	8.5	200	255	625	—	TO-92
2		BCY71	45	100/600	10	0.25	10	6.0	200	—	360	1.2	TO-18
3		2N3502	45	115/300	50	0.25	50	8.0	200	100	700	3.0	TO-39
4		2N3504	45	115/300	50	0.25	50	8.0	200	100	400	1.3	TO-18
5		2N3644	45	115/300	50	0.25	50	8.0	200	100	300	0.7	TO-105
6		PN3644	45	115/300	50	0.25	50	8.0	200	100	625	1.0	TO-92
7	PN3693		45	40/160	10	—	—	3.5	200	—	625	1.0	TO-92
8	PN3694		45	100/400	10	—	—	3.5	200	—	625	1.0	TO-92
9	BFY56		45	30/150	150	0.30	150	2.5	40	625	800	5.0	TO-39
10	2N3642		45	40/120	150	0.22	150	8.0	250	—	350	0.7	TO-105
11	PN3642		45	40/120	150	0.22	150	8.0	250	—	625	1.0	TO-92
12	2N2270		45	50/200	150	0.90	150	15	100	—	1000	5.0	TO-39
13	2N4409		50	60/400	1.0	0.20	1.0	12	60	—	625	—	TO-92
14	2N915		50	50/200	10	1.00	10	3.5	250	—	360	1.2	TO-18
15	2N718A		(50)	40/120	150	1.50	150	25	60	—	500	1.8	TO-18
16	2N1613		(50)	40/120	150	1.50	150	25	80	—	800	3.0	TO-39
17	2N3053		(50)	50/250	150	1.40	150	15	100	—	—	5.0	TO-39
18	2N1711		(50)	100/300	150	1.50	150	25	70	—	800	3.0	TO-39
19		BFX39	55	40/-	100	0.50	500	20	100	400	800	4.0	TO-39
20		2N4354	60	50/500	10	0.15	150	30	100	—	350	0.8	TO-105
21		2N3250A	60	50/150	10	0.25	10	6.0	250	225	360	1.2	TO-18
22		2N3251A	60	100/300	10	0.25	10	6.0	300	250	360	1.2	TO-18
23		2N4355	60	100/400	10	0.15	150	30	100	—	350	0.8	TO-105
24		PN4355	60	100/400	10	0.15	150	30	100	—	625	1.0	TO-92
25		2N3503	60	115/300	50	0.25	50	8.0	200	100	700	3.0	TO-39
26		2N3505	60	115/300	50	0.25	50	8.0	200	100	400	1.3	TO-18
27		2N3645	60	115/300	50	0.25	50	8.0	200	100	300	0.7	TO-105
28		PN3645	60	115/300	50	0.25	50	8.0	200	100	300	0.7	TO-105
29	BC537-6	BC527-6	60	40/100	100	0.50	1000	15	100	—	625	1.0	TO-92
30		2N4030	60	40/120	100	0.15	150	20	100	—	800	4.0	TO-39

SMALL SIGNAL

GENERAL PURPOSE AMPLIFIER AND SWITCHING TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

(ALSO SEE LOW LEVEL AND HIGH VOLTAGE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	h_{FE} (h_{fe}) Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	C_{ob} pF Max	f_T MHz Min	t_{off} ns Max	P_D T_A 25°C mW	T_C 25°C W	Package No.
1	**BC141-6**	**BC161-6**	60	40/100	100	1.40	1000	25	50	—	800	5.0	TO-39
2	**BC537**	**BC527**	60	40/400	100	0.50	1000	15	100	—	625	1.0	TO-92
3	**BC141**	**BC161**	60	40/400	100	1.40	1000	25	50	—	800	5.0	TO-39
4		**MPSA55**	60	50/-	100	0.25	100	—	50	—	625	1.0	TO-92
5	**BC537-10**	**BC527-10**	60	63/160	100	0.50	1000	15	100	—	625	1.0	TO-92
6	**BC141-10**	**BC161-10**	60	63/160	100	1.40	1000	25	50	—	800	5.0	TO-39
7	**BC537-16**	**BC527-16**	60	100/250	100	0.50	1000	15	100	—	625	1.0	TO-92
8	**BC141-16**	**BC161-16**	60	100/250	100	1.40	1000	25	50	—	800	5.0	TO-39
9		**2N4032**	60	100/300	100	0.15	150	20	150	—	800	4.0	TO-39
10	**BC141-25**	**BC161-25**	60	150/400	100	1.40	1000	25	50	—	800	5.0	TO-39
11	**BC537-25**	**BC527-25**	60	160/400	100	0.50	1000	15	100	—	625	1.0	TO-92
12		**2N2904A**	60	40/120	150	0.40	150	8.0	200	110	600	3.0	TO-39
13		**2N2906A**	60	40/120	150	0.40	150	8.0	200	110	400	1.8	TO-18
14		**2N2905A**	60	100/300	150	0.40	150	8.0	200	110	600	3.0	TO-39
15		**PN2905A**	60	100/300	150	0.40	150	8.0	150	110	625	1.0	TO-92
16		**2N2907A**	60	100/300	150	0.40	150	8.0	200	110	400	1.8	TO-18
17		**PN2907A**	60	100/300	150	0.40	150	8.0	150	110	625	1.0	TO-92
18		**BC143**	60	20/-	200	0.60	200	—	—	—	700	3.0	TO-39
19		**BC287**	60	20/200	500	0.45	500	13(Typ)	200(Typ)	—	800	4.0	TO-39
20	**2N3568**		60	40/120	150	0.25	150	20	60	—	300	0.8	TO-105
21	**PN3568**		60	100/300	150	0.18	150	15	250	—	625	1.0	TO-92
22	**PE6020**		60	100/300	150	0.18	150	15	250	—	625	1.0	TO-92
23	**SE6020**		60	100/300	150	0.18	150	15	250	1000	300	0.8	TO-105
24	**BC142**		60	20/-	200	0.40	200	—	—	—	800	5.0	TO-39
25	**BC286**		60	20/180	500	0.40	500	12(Typ)	100(Typ)	—	800	4.0	TO-39
26		**BFX41**	75	40/-	100	0.50	500	20	100	400	800	4.0	TO-39
27		**BFX40**	75	60/-	500	0.50	500	20	150	—	800	4.0	TO-39
28		**2N4356**	80	50/250	10	0.15	150	30	100	—	350	0.8	TO-105
29		**BC528-6**	80	40/100	100	0.50	1000	15	100	—	625	1.0	TO-92
30	**BC538**	**BC528**	80	40/400	100	0.50	1000	15	100	—	625	1.0	TO-92

SMALL SIGNAL

GENERAL PURPOSE AMPLIFIER AND SWITCHING TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

(ALSO SEE LOW LEVEL AND HIGH VOLTAGE SECTION)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} (V_{CER}) V Min	h_{FE} (h_{fe}) Min/Max	@ I_C mA	$V_{CE(sat)}$ V Max	@ I_C mA	C_{ob} pF Max	f_T MHz Min	t_{off} ns Max	P_D T_A 25°C mW	P_D T_C 25°C W	Package No.
1	MPSA06	MPSA56	80	50/-	100	0.25	100	—	50	—	625	1.0	TO-92
2	BC538-10	BC528-10	80	63/160	100	0.50	1000	15	100	—	625	1.0	TO-92
3		2N4033	80	100/300	100	0.15	150	20	150	—	800	4.0	TO-39
4	BC538-16	BC528-16	80	100/250	100	0.50	1000	15	100	—	625	1.0	TO-92
5	BC538-25	BC528-25	80	160/400	100	0.50	1000	15	100	—	625	1.0	TO-92
6	2N4410		80	60/400	10	0.20	1.0	12	60	—	625	—	TO-92
7	2N3020		80	40/120	150	0.20	150	12	80	—	800	5.0	TO-39
8	2N1893		80	40/120	150	5.00	150	15	50	—	800	3.0	TO-39
9	PE6021		80	100/300	150	0.18	150	15	250	1000	625	1.0	TO-92
10	SE6021		80	100/300	150	0.18	150	15	250	1000	300	0.8	TO-105
11	2N3019		80	100/300	150	0.20	150	12	100	—	800	5.0	TO-39
12	2N2405		90	60/200	150	0.50	150	15	200	—	800	2.4	TO-39

LOW LEVEL, LOW NOISE AMPLIFIER TRANSISTORS (BY ASCENDING V_{CEO})

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	h_{FE} Min/Max	@ I_C mA	NF dB Max	@ f kHz	NF dB Max	@ f kHz	Package No.
13	2N5133		18	60/1000	1.0	—	—	—	—	—	—	TO-106
14	BC208		20	90 (Typ)/-	0.01	110/800	2.0	10	1.0	—	—	TO-106
15	BC208A		20	90 (Typ)/-	0.01	110/220	2.0	10	1.0	—	—	TO-106
16	BC208B	BC205B	20	150 (Typ)/-	0.01	200/450	2.0	10	1.0	—	—	TO-106
17	BC208C		20	270 (Typ)/-	0.01	420/800	2.0	10	1.0	—	—	TO-106
18	BC209		20	150 (Typ)/-	0.01	200/800	2.0	4.0	1.0	4.0	WB	TO-106
19	BC209B		20	150 (Typ)/-	0.01	200/450	2.0	4.0	1.0	4.0	WB	TO-106
20	BC209C		20	270 (Typ)/-	0.01	420/450	2.0	4.0	1.0	4.0	WB	TO-106
21	BC319	BC322	20	150 (Typ)/-	0.01	200/800	2.0	4.0	1.0	4.0	WB	TO-92
22	BC319B	BC322B	20	150 (Typ)/-	0.01	200/450	2.0	4.0	1.0	4.0	WB	TO-92
23	BC319C	BC322C	20	270 (Typ)/-	0.01	420/800	2.0	4.0	1.0	4.0	WB	TO-92
24	BC522		20	—	—	400/2000	2.0	3.0	1.0	3.0	WB	TO-92
25	BC522C		20	—	—	400/800	2.0	3.0	1.0	3.0	WB	TO-92
26	BC522D		20	—	—	750/1550	2.0	3.0	1.0	3.0	WB	TO-92

SMALL SIGNAL

LOW LEVEL, LOW NOISE AMPLIFIER TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	h_{FE} Min/Max	@ I_C mA	NF dB Max	@ f kHz	NF dB Max	@ f kHz	Package No.
1	BC522E		20	—	—	1200/2200	2.0	3.0	1.0	3.0	WB.	TO-92
2	BC113		20	120/-	0.1	200/-	1.0	2.5 (Typ)	1.0	—	—	TO-106
3		BC205	20	80 (Typ)/-	0.01	110/500	2.0	10	1.0	—	—	TO-106
4		BC205A	20	80 (Typ)/-	0.01	110/220	2.0	10	1.0	—	—	TO-106
5		BC205C	20	80 (Typ)/-	0.01	400/800	2.0	10	1.0	—	—	TO-106
6		BC179	20	120/460	2.0	—	—	4.0	1.0	4.0	WB	TO-18
7		BC179A	20	120/220	2.0	—	—	4.0	1.0	4.0	WB	TO-18
8		BC179B	20	180/460	2.0	—	—	4.0	1.0	4.0	WB	TO-18
9		BC178	25	70/460	2.0	—	—	10	1.0	—	—	TO-18
10		BC178VI	25	70/140	2.0	—	—	10	1.0	—	—	TO-18
11		BC178A	25	120/220	2.0	—	—	10	1.0	—	—	TO-18
12		BC178B	25	180/460	2.0	—	—	10	1.0	—	—	TO-18
13	BC114		25	120/-	0.1	200/-	10	3.0	1.0	—	—	TO-106
14	2N5089		25	400/1200	0.1	400/-	10	—	—	2.0	WB	TO-92
15	2N3565		25	70/-	0.1	150/600	1.0	—	—	—	—	TO-106
16	PN3565		25	70/-	0.1	150/600	1.0	—	—	—	—	TO-92
17	SE4010		25	200/1000	1.0	—	—	3.0	1.0	—	—	TO-106
18	SE4002		25	200/1000	1.0	—	—	—	—	—	—	TO-106
19	SE4001		25	60/300	1.0	—	—	—	—	—	—	TO-106
20	BC115		30	50/-	1.0	50/-	100	—	—	—	—	TO-105
21	BC318	BC321	30	90 (Typ)/-	0.01	110/800	2.0	6.0	1.0	—	—	TO-92
22	BC318A	BC321A	30	90 (Typ)/-	0.01	110/220	2.0	6.0	1.0	—	—	TO-92
23	BC318B	BC321B	30	150 (Typ)/-	0.01	200/450	2.0	6.0	1.0	—	—	TO-92
24	BC318C		30	270 (Typ)/-	0.01	420/800	2.0	6.0	1.0	—	—	TO-92
25	SE4023		30	900/-	0.01	1200/2200	10	3.0	1.0	8.0	0.01	TO-106
26	2N5088		30	300/900	0.1	300/-	10	—	—	3.0	WB	TO-92
27		BC321C	30	80(Typ)/-	0.01	400/800	2.0	6.0	1.0	—	—	TO-92
28		2N5138	30	50/800	0.10	50/-	1.0	—	—	—	—	TO-106
29		PN5138	30	50/800	0.10	50/-	1.0	—	—	—	—	TO-92
30		BC153	40	50/-	0.10	50/-	10	1.0	1.0	—	—	TO-106
31		BC154	40	160/-	0.10	160/-	10	2.5	1.0	—	—	TO-106
32		2N4250	40	250/700	0.10	250/-	1.0	2.0	1.0	2.0	WB	TO-106

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SMALL SIGNAL

LOW LEVEL, LOW NOISE AMPLIFIER TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	h_{FE} Min/Max	@ I_C mA	NF dB Max	@ f kHz	NF dB Max	@ f kHz	Package No.
1		PN4250	40	250/700	0.10	250/-	1.0	2.0	1.0	2.0	WB	TO-92
2		2N4248	40	50/-	0.10	50/-	1.0	—	—	—	—	TO-106
3		PN4248	40	50/-	0.10	50/-	1.0	—	—	—	—	TO-92
4	BC207	BC204	45	90(Typ)/-	0.01	50/450	2.0	10	1.0	—	—	TO-106
5	BC207A	BC204A	45	90(Typ)/-	0.01	110/220	2.0	10	1.0	—	—	TO-106
6	BC207B	BC204B	45	150(Typ)/-	0.01	200/450	2.0	10	1.0	—	—	TO-106
7	BC317	BC320	45	90(Typ)/-	0.01	110/450	2.0	6.0	1.0	—	—	TO-92
8	BC317A	BC320A	45	90(Typ)/-	0.01	110/220	2.0	6.0	1.0	—	—	TO-92
9	BC317B	BC320B	45	150(Typ)/-	0.01	200/450	2.0	6.0	1.0	—	—	TO-92
10		BC177	45	70/220	2.0	—	—	10	1.0	—	—	TO-18
11		BC177VI	45	70/140	2.0	—	—	10	1.0	—	—	TO-18
12		BC177A	45	120/220	2.0	—	—	10	1.0	—	—	TO-18
13		BC177B	45	180/460	2.0	—	—	10	1.0	—	—	TO-18
14		2N3964	45	180/-	0.001	250/500	0.01	2.0	1.0	4.0	0.1	TO-18
15	2N930		45	100/300	0.01	600/-	10	—	—	3.0	WB	TO-18
16	2N5962		45	450/-	0.01	600/1400	10	3.0	1.0	3.0	WB	TO-92
17	SE4021		45	450/-	0.01	600/1400	10	3.0	1.0	3.0	WB	TO-106
18	BC523		45	180/800	2.0	100/-	0.01	—	—	—	—	TO-92
19	BC523B		45	180/400	2.0	100/-	0.01	—	—	—	—	TO-92
20	BC523C		45	380/800	2.0	100/-	0.01	—	—	—	—	TO-92
21	BC521		45	600/1400	10	350/-	0.01	3.0	1.0	—	—	TO-92
22	BC521C		45	380/800	2.0	350/-	0.01	3.0	1.0	3.0	WB	TO-92
23	BC521D		45	750/1500	2.0	350/-	0.01	3.0	1.0	3.0	WB	TO-92
24	2N5210		50	200/600	0.1	250/-	10	3.0	1.0	2.0	WB	TO-92
25	2N5209		50	100/300	0.1	150/-	10	4.0	1.0	3.0	WB	TO-92
26		2N5087	50	250/800	0.10	250/-	10	2.0	1.0	2.0	WB	TO-92
27		2N5086	50	150/500	0.10	150/-	10	3.0	1.0	3.0	WB	TO-92
28		BC526	50	40/-	0.01	(100/600)	2.0	—	—	—	—	TO-92
29		BC526A	50	40/-	0.01	(100/300)	2.0	—	—	10	WB	TO-92
30		EN3962	60	60/-	0.01	100/300	0.01	3.0	1.0	10	0.1	TO-106
31		2N4250A	60	250/700	0.10	250/-	1.0	2.0	1.0	2.0	WB	TO-106
32		2N4249	60	100/300	0.10	100/-	1.0	3.0	1.0	3.0	WB	TO-106

SMALL SIGNAL

LOW LEVEL, LOW NOISE AMPLIFIER TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	h_{FE} Min/Max	@ I_C mA	NF dB Max	@ f kHz	NF dB Max	@ f kHz	Package No.
1		PN4249	60	100/300	0.10	100/-	1.0	3.0	1.0	3.0	WB	TO-92
2		2N3965	60	180/-	0.001	250/500	0.01	2.0	1.0	4.0	0.1	TO-18
3		BFX37	60	70/300	0.01	100/-	1.0	3.0	1.0	3.0	WB	TO-18
4		2N3962	60	60/-	0.001	100/300	0.01	3.0	1.0	10	0.1	TO-18
5	2N5961		60	100/-	0.01	150/950	10	6.0	1.0	—	—	TO-92
6	SE4020		60	100/-	0.01	150/950	10	6.0	1.0	—	—	TO-106
7	2N2484		60	100/500	0.01	250/-	1.0	2.0	10	3.0	WB	TO-18
8	EN2484		60	100/500	0.01	250/-	1.0	2.0	10	3.0	WB	TO-106
9	PN2484		60	100/500	0.01	250/-	1.0	2.0	10	3.0	WB	TO-92
10	BC520		60	150/700	10	100/-	0.01	3.0	1.0	3.0	WB	TO-92
11	BC520B		60	180/460	2.0	100/-	0.01	3.0	1.0	3.0	WB	TO-92
12	BC520C		60	380/800	2.0	100/-	0.01	3.0	1.0	3.0	WB	TO-92
13	2N3117		60	250/500	0.01	400/-	1.0	1.0	1.0	1.0	10	TO-18

HIGH VOLTAGE AMPLIFIER TRANSISTORS (BY ASCENDING V_{CEO})

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	f_T MHz Min	C_{ob} pF Max	P_D T_A 25°C mW	T_C 25°C W	Package No.
14		MPSL51	100	40/250	50	60	8.0	625	1.0	TO-92
15	MPSL01		120	50/300	10	60	8.0	814	1.79	TO-92
16	2N5830		120	80/500	25	100	40	814	1.79	TO-92
17		BC530	120	40/180	10	100	6.0	625	1.0	TO-92
18		2N5400	120	40/180	10	100	6.0	625	1.0	TO-92
19	BFY57		125	30/150	30	40	12	800	5.0	TO-39
20	BC532		140	60/250	10	100	6.0	814	1.79	TO-92
21	2N5550		140	60/250	10	100	6.0	814	1.79	TO-92
22	2N3114		150	30/120	30	40	9.0	800	5.0	TO-39
23		BC531	150	60/240	10	100	6.0	625	1.0	TO-92
24		PN4888	150	40/400	10	30	4.0	625	1.0	TO-92
25		2N5401	150	60/240	10	100	6.0	625	1.0	TO-92
26		PN4889	150	80/300	10	40	4.0	625	1.0	TO-92
27	BF257		160	40/150	10	40	3.5	1000	7.0	TO-39

SMALL SIGNAL

HIGH VOLTAGE AMPLIFIER TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	f_T MHz Min	C_{ob} pF Max	P_D T_A 25°C mW	T_C 25°C W	Package No.
1	BC533		160	80/250	10	100	6.0	814	1.79	TO-92
2	MPS5551M		160	80/250	10	100	6.0	814	1.79	TO-92
3	2N5831		160	80/250	10	100	4.0	814	1.79	TO-92
4	2N5832		160	175/500	10	100	4.0	814	1.79	TO-92
5	2N5833		180	50/250	10	100	4.0	814	1.79	TO-92
6	BF336		180	20/-	30	80	(3.5)	800	—	TO-39
7	BD115		180	22/-	50	—	3.5	—	6.0	TO-39
8	BF337		200	20/-	30	80	(3.5)	800	—	TO-39
9	2N4926		200	20/200	30	30	(6.0)	1000	7.0	TO-39
10	MPSA43		200	50/200	30	50	4.0	878	2.08	TO-92
11		MPSA93	200	30/150	30	50	8.0	625	1.0	TO-92
12	SE7055		220	40/150	10	40	(3.5)	1000	7.0	TO-39
13	PE7058		220	40/220	30	40	4.0	1230	4.17	TO-92
14	BF338		225	20/-	30	80	(3.5)	800	—	TO-39
15	BF258		250	40/150	10	40	3.5	1000	7.0	TO-39
16	2N4927		250	20/200	30	30	(6.0)	1000	7.0	TO-39
17	2N5059		250	30/150	30	30	10	1000	5.0	TO-39
18	2N5058		300	35/150	30	30	10	1000	5.0	TO-39
19	MPSA42		300	40/200	30	50	3.0	878	2.08	TO-92
20	PE7059		300	40/200	30	40	4.0	1230	4.17	TO-92
21	BF259		300	25/-	30	90 (Typ)	4.2	1000	7.0	TO-39
22		MPSA92	300	25/-	30	50	6.0	625	1.0	TO-92
23	SE7056		300	40/100	10	40	(3.0)	1000	7.0	TO-39

NPN RF-IF AMPLIFIER AND OSCILLATOR TRANSISTORS (BY ASCENDING FREQUENCY)

Item	DEVICE NO.	PG [GMA] (OSC POWER) dB Min	@ f MHz	V_{CEO} V Min	f_T MHz Min	C_{ob} [C_{ce}] (C_{cb}) pF Max	NF dB Max	@ f MHz	P_D T_A 25°C mW	Package No.
24	BF160	—	—	12	400	1.2	—	—	310	TO-106
25	BF152	28	10.7	12	600	1.2	—	—	310	TO-106

SMALL SIGNAL

NPN RF-IF AMPLIFIER AND OSCILLATOR TRANSISTORS (BY ASCENDING FREQUENCY) (Cont'd)

Item	DEVICE NO.	PG [GMA] (OSC POWER) dB Min	@ f MHz	V_{CEO} V Min	f_T MHz Min	C_{ob} [C_{ce}] (C_{cb}) pF Max	NF dB Max	@ f MHz	P_D T_A 25°C mW	Package No.
1	**BF159**	22	40	20	600	1.2	3.5 (Typ)	60	310	TO-106
2	**BF163**	22	40	40	400	0.8 (Typ)	3.0 (Typ)	40	310	TO-106
3	**PE5025**	25	45	30	300	(1.1)	—	—	425 (65°C)	TO-92
4	**FTR118**	27	45	20	300	(0.2) (Typ)	5.0	45	500	TO-92
5	**BF167**	27	45	30	300	0.22	3.0 (Typ)	45	175	TO-72
6	**PE5030B**	28	45	40	600	(0.4)	—	—	425 (65°C)	TO-92
7	**BF222**	20 (Typ)	100	50	400	0.4 (Typ)	5.0	0.1	310	TO-72
8	**2N3563**	14	200	12	600	1.7	—	—		TO-106
9	**2N5179**	15	200	12	900	(1.0)	4.5	200	250	TO-72
10	**2N918**	15	200	15	600	1.7	6.0	60	200	TO-72
11	**PN918**	15	200	15	600	1.7	6.0	60	625	TO-92
12	**BF162**	15	200	40	400	1.2	5.5	200	310	TO-106
13	**PN3690**	15	200	40	400	1.6	5.5	200	200	TO-92
14	**FTR168**	16	200	300	400	0.12 (Typ)	4.0	200	500	TO-92
15	**2N5130**	17	200	12	450	(1.7)	—	—	200	TO-106
16	**SE5020**	20	200	20	375	0.5	3.3	200	175	TO-18
17	**FTR158**	20	200	20	300	(0.20) (Typ)	3.3	200	500	TO-92
18	**SE5035**	22	200	30	600	0.3	—	—	200	TO-18
19	**FTR129**	22	200	30	600	(0.20) (Typ)	4.5	200	500	TO-92
20	**PE5031**	22	200	30	600	(0.4)	4.5	200	425 (65°C)	TO-92
21	**2N2857**	12.5	450	15	1000	(1.0)	4.5	450	250	TO-72
22	**2N3839**	12.5	450	15	1000	(1.0)	3.4	450	250	TO-72
23	**2N3880**	14	450	15	1200	(.75)	3.5	450	250	TO-72
24	**2N5031**	14	450	10	1000	(1.5)	2.5	450	250	TO-72
25	**FMT1090**	14 (Typ)	450	14	1400 (Typ)	(1.2)	4.0	450	600	TO-92
26	**FMT1091**	15 (Typ)	450	14	1400 (Typ)	(1.2)	3.5	450	600	TO-92
27	**FMT1190**	12.5 (Typ)	450	12	1400 (Typ)	(1.2)	5.0	450	600	TO-92
28	**FMT2060**	15 (Typ)	450	14	1000	(1.0)	2.8 (Typ)	450	240	TO-120
29	**FMT2080**	13.0 (Typ)	450	14	1400 (Typ)	(0.9)	2.0 (Typ)	450	200	TO-72
30	**FMT2085**	13.0 (Typ)	450	14	1400 (Typ)	(1.0)	2.0 (Typ)	450	400	TO-92

SMALL SIGNAL

NPN RF-IF AMPLIFIER AND OSCILLATOR TRANSISTORS (BY ASCENDING FREQUENCY) (Cont'd)

Item	DEVICE NO.	PG [GMA] (OSC POWER) dB Min	@ f MHz	V_{CEO} V Min	f_T MHz Min	C_{ob} [C_{ce}] (C_{cb}) pF Max	NF dB Max	@ f MHz	P_D T_A 25°C mW	Package No.
1	**FMT2090**	13.0 (Typ)	450	14	1400 (Typ)	(0.8)	2.0 (Typ)	450	240	TO-120
2	**2N5770**	15	500	15	900	—	6.0	60	625	TO-92
3	**PN3563**	(30)	500	12	600	1.7	6.0	60	625	TO-92
4	**PN918**	(30)	500	15	600	1.7	6.0	60	625	TO-92
5	**SE3002**	(3.0)	930	12	600	1.7	—	—	200	TO-106
6	**FMT1061**	—	—	14	1000	(1.0)	3.5	450	250	TO-72
7	**FMT1061A**	13.8 (Typ)	1000	14	1300	(1.0)	3.0	450	250	TO-72
8	**FTR129A**	—	—	35	1000 (Typ)	(0.40) (Typ)	—	—	500	TO-92
9	**2N3570**	—	—	15	1500	(0.75)	7.0	1000	250	TO-72
10	**2N3571**	—	—	15	1200	(0.85)	4.0	450	250	TO-72
11	**2N3572**	—	—	13	1000	(0.85)	6.0	450	250	TO-72
12	**2N3683**	—	—	12	1000	2.0	4.0	200	250	TO-72

DUAL TRANSISTORS (BY ASCENDING V_{CEO})

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	Matching h_{FE} %	V_{BE} mV	Package No.
13	**MD2369A**		15	40/120	10	10	5.0	TO-78
14	**MD2369B**		15	40/120	10	20	10	TO-78
15	**MD918A**		15	50/-	1.0	10	5.0	TO-78
16	**MD918B**		15	50/-	1.0	20	5.0	TO-78
17	**MD2218A**		40	40/120	150	—	—	TO-78
18	**MD2219A**		40	100/300	150	—	—	TO-78
19	**2N2913**		45	60/240	0.01	—	—	TO-78
20	**2N2917**		45	60/240	0.01	20	10	TO-78
21	**2N2915**		45	60/240	0.01	10	3.0	TO-78
22	**2N2914**		45	150/300	0.01	—	—	TO-78
23	**2N2918**		45	150/300	0.01	20	5.0	TO-78
24		**2N4020**	45	250/600	0.01	20	5.0	TO-78
25		**2N4023**	45	250/600	0.1	10	3.0	TO-78
26	***2N2919**		60	60/240	0.01	10	3.0	TO-39

*Also available in JAN, JTX and TXV.

SMALL SIGNAL

DUAL TRANSISTORS (BY ASCENDING V_{CEO}) (Cont'd)

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	Matching h_{FE} %	V_{BE} mV	Package No.
1	*2N2920		60	150/300	0.01	10	3.0	TO-78
2	*2N2920A		60	150/300	0.01	10	1.5	TO-78
3		2N3800	60	150/450	0.1	—	—	TO-71
4		2N3806	60	150/450	0.1	—	—	TO-78
5		2N3802	60	150/450	0.1	20	8.0	TO-71
6		2N3808	60	150/450	0.1	20	8.0	TO-78
7		2N3804	60	150/450	0.1	10	5.0	TO-71
8		2N3810	60	150/450	0.1	10	5.0	TO-78
9		2N4025	60	250/600	0.1	10	3.0	TO-78
10		2N3805	60	300/900	0.1	10	5.0	TO-71
11		2N3811	60	300/900	0.1	10	5.0	TO-78
12		2N4017	80	100/350	0.01	—	—	TO-78

UNMATCHED QUAD TRANSISTORS (BY ASCENDING V_{CEO})

Item	DEVICE NO. Polarity NPN	PNP	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	V_{CE} (sat) V Max	@ I_C mA	Package No.
13	FPQ3724	FPQ3467	40	30/-	500	0.5	500	TO-116
14	FPQ2222	FPQ2907	40	100/-	150	0.4	150	TO-116
15	FPQ3725	FPQ3468	50	20/-	500	0.5	500	TO-116

NPN DARLINGTON TRANSISTORS (BY ASCENDING V_{CEO})

Item	DEVICE NO.	V_{CEO} V Min	h_{FE} Min/Max	@ I_C mA	V_{CE} (sat) V Max	@ I_C mA	Package No.
16	MPSA12	20	20000/-	10	1.0	10	TO-92
17	MPSA13	30	5000/-	10	1.5	100	TO-92
18	MPSA14	30	10000/-	10	1.5	100	TO-92
19	2N997	40	7000/70000	100	1.6	100	TO-18
20	2N2725	45	2000/10000	10	1.0	10	TO-72

*Also available in JAN, JTX and TXV.

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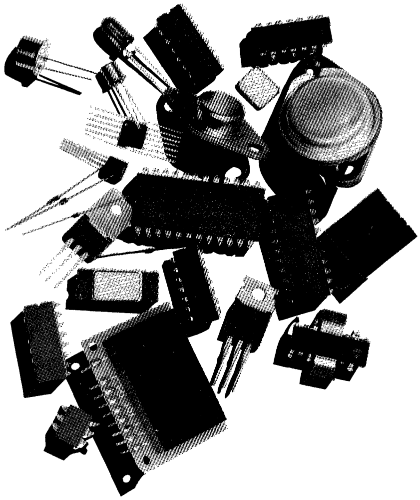
SMALL SIGNAL

NPN AND PNP TRANSISTOR DICE (BY APPLICATION)

Item	DEVICE NO.	Pol.	Basic Standard Device	V_{CEO} V Min	I_{CBO} nA Max	@ V_{CB} V	h_{FE} Min/Max	@ I_C mA	Chip Size Mils	Basic Application
1	**DN2484**	NPN	2N2484	60	20	45	250/-	1.0	17.5x17.5	Low Level, Low Noise Amp.
2	**DN3962**	PNP	2N3962	60	20	50	100/450	1.0	11x24	Low Level, Low Noise Amp.
3	**DN918**	NPN	2N918	15	20	15	20/-	3.0	9x14	R. F. Amp.
4	**DN3904**	NPN	2N3904	40	50	30	100/300	10	11x18	General Purpose Amp.
5	**DN3906**	PNP	2N3906	40	50	30	100/300	10	11x20	General Purpose Amp.
6	**DN2222A**	NPN	2N2222A	40	20	60	100/300	100	15x16.5	G. P. Amp. and Switch
7	**DN2907**	PNP	2N2907	40	20	50	100/300	100	19x19	G. P. Amp. and Switch
8	**DN3019**	NPN	2N3019	80	20	90	100/300	100	30x30	G. P. Amp. and Switch
9	**DN4033**	PNP	2N4033	80	50	60	100/300	100	24x30	G. P. Amp. and Switch
10	**DN3930**	PNP	2N3930	180	20	100	80/300	10	22x22	High Voltage Amp. and Switch
11	**DN2369A**	NPN	2N2369A	15	400	20	40/120	10	9x14	High Speed Sat. Switch
12	**DN4209**	PNP	2N4209	15	20	8.0	35/-	1.0	9.5x14.5	High Speed Sat. Switch
13	**DN3014**	NPN	2N3014	20	300	20	30/120	30	13.5x13.5	High Speed Sat. Switch
14	**DN3725**	NPN	2N3725	50	1700	60	60/150	100	27x27	High Speed Core Driver
15	**DN3468**	PNP	2N3468	50	100	30	25/-	100	27x33	High Speed Core Driver



OPTO

LED VISIBLE LAMPS

Item	DEVICE NO.	Lens Characteristic	I_F mA Typ	Luminous Intensity $I_F = 20mA$ mcd Typ	V_F $I_F = 20mA$ V Typ	Package No.
1	**FLV104A**	Clear	100	(4.0mW/sr)	2.0	Opto-8
2	**FLV110**	Red Diffused	20	2.0	1.7	Opto-5
3	**FLV111**	Clear Point Source	20	2.0	1.7	Opto-5
4	**FLV112**	Clear Diffused	20	2.0	1.7	Opto-5
5	**FLV117**	Red Diffused	50	1.0	1.9	Opto-5
6	**FLV140**	Red Diffused	20	2.0	1.7	Opto-4
7	**FLV141**	Red Point Source	20	2.0	1.7	Opto-4
8	**FLV150**	Red Diffused	20	2.0	1.7	Opto-4
9	**FLV151**	Red Point Source	20	2.0	1.7	Opto-4
10	**FLV152**	Red Point Source	20	3.0	1.7	Opto-4
11	**FLV160**	Red Diffused	20	2.0	1.7	Opto-7
12	**FLV161**	Red Point Source	20	2.0	1.7	Opto-7
13	**FLV251**	Red Point Source	10	5.0	2.1	Opto-4
14	**FLV252**	Red Point Source	10	8.0	2.1	Opto-4
15	**FLV310**	Green Diffused	20	3.2	2.3	Opto-5
16	**FLV311**	Green Point Source	20	3.2	2.3	Opto-5
17	**FLV315**	Green Diffused	20	2.5	3.0	Opto-5
18	**FLV340**	Green Diffused	20	3.2	2.3	Opto-4
19	**FLV341**	Green Point Source	20	3.2	2.3	Opto-4
20	**FLV350**	Green Diffused	20	3.2	2.3	Opto-6
21	**FLV351**	Green Point Source	20	3.2	2.3	Opto-6
22	**FLV355**	Green Diffused	20	2.5	3.0	Opto-6
23	**FLV360**	Green Diffused	20	3.2	2.3	Opto-7
24	**FLV361**	Green Point Source	20	3.2	2.3	Opto-7
25	**FLV365**	Green Diffused	20	2.5	3.0	Opto-7
26	**FLV410**	Yellow Diffused	20	3.2	2.3	Opto-5
27	**FLV411**	Yellow Point Source	20	3.2	2.3	Opto-5
28	**FLV440**	Yellow Diffused	20	3.2	2.3	Opto-4
29	**FLV441**	Yellow Point Source	20	3.2	2.3	Opto-4

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LED VISIBLE LAMPS (Cont'd)

Item	DEVICE NO.	Lens Characteristic	I_F mA Typ	Luminous Intensity I_F = 20mA mcd Typ	V_F V Typ	Package No.
1	**FLV450**	Yellow Diffused	20	3.2	2.3	Opto-6
2	**FLV451**	Yellow Point Source	20	3.2	2.3	Opto-6
3	**FLV460**	Yellow Diffused	20	3.2	2.3	Opto-7
4	**FLV461**	Yellow Point Source	20	3.2	2.3	Opto-7
5	**FLV510**	Red Diffused	10	3.0	1.9	Opto-5
6	**FLV511**	Red Point Source	10	3.0	1.9	Opto-5
7	**FLV540**	Red Diffused	10	3.0	1.9	Opto-4
8	**FLV541**	Red Point Source	10	3.0	1.9	Opto-4
9	**FLV550**	Red Diffused	10	3.0	1.9	Opto-6
10	**FLV551**	Red Point Source	10	3.0	1.9	Opto-6
11	**FLV560**	Red Diffused	10	3.0	1.9	Opto-7
12	**FLV561**	Red Point Source	10	3.0	1.9	Opto-7
13	**MV5050**	Clear Point Source	20	2.0	1.7	Opto-9
14	**MV5051**	Clear Diffused	20	1.6	1.7	Opto-9
15	**MV5052**	Red Point Source	20	2.0	1.7	Opto-9
16	**MV5053**	Red Diffused	20	1.6	1.7	Opto-9
17	**MV5054-1**	Red Semi-Diffused	20	2.0	1.7	Opto-10
18	**MV5054-2**	Red Semi-Diffused	20	3.0	1.7	Opto-10
19	**MV5054-3**	Red Semi-Diffused	20	4.0	1.7	Opto-10
20	**MV5152**	Amber Point Source	20	16.0	1.9	Opto-10
21	**MV5153**	Amber Diffused	20	4.0	1.9	Opto-9
22	**MV5154**	Amber Semi-Diffused	20	8.0	1.9	Opto-10
23	**MV5252**	Green Point Source	20	6.0	2.3	Opto-10
24	**MV5253**	Green Diffused	20	1.5	2.3	Opto-9
25	**MV5254**	Green Semi-Diffused	20	3.0	2.3	Opto-10
26	**MV5352**	Yellow Point Source	20	10.0	2.3	Opto-10
27	**MV5353**	Yellow Diffused	20	6.0	2.3	Opto-9
28	**MV5354**	Yellow Semi-Diffused	20	10.0	2.3	Opto-10
29	**MV5752**	Red Point Source	20	16.0	1.9	Opto-10
30	**MV5753**	Red Diffused	20	4.0	1.9	Opto-9

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LED VISIBLE LAMPS (Cont'd)

Item	DEVICE NO.	Lens Characteristic	I_F mA Typ	Luminous Intensity I_F = 20mA mcd Typ	V_F V Typ	Package No.
1	**MV5754**	Red Semi-Diffused	20	8.0	1.9	Opto-10
2	**TIL209A**	Red Diffused T-1	20	2.0	1.7	Opto-11
3	**TIL211**	Green Diffused T-1	20	0.5	1.7	Opto-11
4	**TIL213**	Yellow Diffused T-1	20	0.5	1.7	Opto-11

LED LAMP MOUNTING HARDWARE

Item	DEVICE NO.	Panel Thickness	Panel Hole	Description	Package No.
5	**FLS010**	.060 to .250	.265 ±.002	Single-Part Construction (Flat Black Finish)	Opto-1
6	**FLS011**	0.187	.250 ±.003	3-Piece Construction: Hex Nut, Threaded Barrel and Bezel (Bezel in Silver Finish)	Opto-2
7	**FLS012**	0.187	.250 ±.003	3-Piece Construction: Hex Nut, Threaded Barrel and Bezel (Bezel in Black Finish)	Opto-2
8	**MP52**	0.125	.250 ±.003	Mounting Clip for MV Series Lamps	Opto-3

7-SEGMENT NUMERIC DISPLAYS

Item	DEVICE NO.	Character Height Inches	Polarity	Color	Description	Decimal Point	Peak Current/Seg Pulse = 100µs mA	V_F I_F = 20mA/Seg V	Luminous Intensity/Seg I_F = 20mA µcd	Logic/Connection Diagram	Package No.
9	**FND350**	0.362	CA	Red	7-Segment Display	RH	200	1.7	450	O1	Opto-12
10	**FND351**	0.362	CA	Red	Overflow ±1 Digit	RH	200	1.7	450	O2	Opto-12
11	**FND357**	0.362	CC	Red	7-Segment Display	RH	200	1.7	450	O1	Opto-12
12	**FND358**	0.362	CC	Red	Overflow ±1 Digit	RH	200	1.7	450	O2	Opto-12
13	**FND360**	0.362	CA	Red	7-Segment Display	RH	200	1.7	900	O1	Opto-12
14	**FND361**	0.362	CA	Red	Overflow ± Digit	RH	200	1.7	900	O2	Opto-12
15	**FND367**	0.362	CC	Red	7-Segment Display	RH	200	1.7	900	O1	Opto-12
16	**FND368**	0.362	CC	Red	Overflow ±1 Digit	RH	200	1.7	900	O2	Opto-12
17	**FND500**	0.500	CC	Red	7-Segment Display	RH	200	1.7	600	O3	Opto-13
18	**FND501**	0.500	CC	Red	Overflow ±1 Digit	RH	200	1.7	600	O4	Opto-13
19	**FND507**	0.500	CA	Red	7-Segment Display	RH	200	1.7	600	O3	Opto-13
20	**FND508**	0.500	CA	Red	Overflow ±1 Digit	RH	200	1.7	600	O4	Opto-13

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7-SEGMENT NUMERIC DISPLAYS (Cont'd)

Item	DEVICE NO.	Character Height Inches	Polarity	Color	Description	Decimal Point	Peak Current/Seg Pulse = 100μs mA	V_F I_F = 20mA/Seg V	Luminous Intensity/Seg I_F = 20mA μcd	Logic/Connection Diagram	Package No.
1	**FND530**	0.500	CC	Grn	7-Segment Display	RH	80	2.2	2000	O3	Opto-13
2	**FND531**	0.500	CC	Grn	Overflow ±1 Digit	RH	80	2.2	2000	O4	Opto-13
3	**FND537**	0.500	CA	Grn	7-Segment Display	RH	80	2.2	2000	O3	Opto-13
4	**FND538**	0.500	CA	Grn	Overflow ±1 Digit	RH	80	2.2	2000	O4	Opto-13
5	**FND540**	0.500	CC	Yel	7-Segment Display	RH	80	2.2	2000	O3	Opto-13
6	**FND541**	0.500	CC	Yel	Overflow ± Digit	RH	80	2.2	2000	O4	Opto-13
7	**FND547**	0.500	CA	Yel	7-Segment Display	RH	80	2.2	2000	O3	Opto-13
8	**FND548**	0.500	CA	Yel	Overflow ± Digit	RH	80	2.2	2000	O4	Opto-13
9	**FND550**	0.500	CC	Amb	7-Segment Display	RH	80	2.2	2000	O3	Opto-13
10	**FND551**	0.500	CC	Amb	Overflow ±1 Digit	RH	80	2.2	2000	O4	Opto-13
11	**FND557**	0.500	CA	Amb	7-Segment Display	RH	80	2.2	2000	O3	Opto-13
12	**FND558**	0.500	CA	Amb	Overflow ±1 Digit	RH	80	2.2	2000	O4	Opto-13
13	**FND560**	0.500	CC	Red	7-Segment Display	RH	200	2.2	1200	O3	Opto-13
14	**FND561**	0.500	CC	Red	Overflow ±1 Digit	RH	200	1.7	1200	O4	Opto-13
15	**FND567**	0.500	CA	Red	7-Segment Display	RH	200	1.7	1200	O3	Opto-13
16	**FND568**	0.500	CA	Red	Overflow ±1 Digit	RH	200	1.7	1200	O4	Opto-13
17	**FND800**	0.800	CC	Red	7-Segment Display	RH	200	1.7	600	O5	Opto-14
18	**FND807**	0.800	CA	Red	7-Segment Display	RH	200	1.7	600	O5	Opto-14
19	**FND847**	0.800	CA	Red	7-Segment Display	LH	200	1.7	600	O6	Opto-14
20	**FND850**	0.800	CC	Red	7-Segment Display	LH	200	1.7	600	O6	Opto-14
21	**FND6710**	0.560	CA	Red	Dual Digit Display	RH	200	1.7	500	O10	Opto-16
22	**FND6730***	0.560	CA	Red	1 1/2 Digit ±18 Display	RH	200	1.7	500	—	—
23	**FND6740**	0.560	CC	Red	Dual Digit Display	RH	200	1.7	500	O10	Opto-16
24	**FND6750***	0.560	CC	Red	1/2 Digit ±18 Display	RH	200	1.7	500	—	—
25	**MAN71A**	0.300	CA	Red	7-Segment Display	RH	200	1.7	450	O7	Opto-15
26	**MAN72A**	0.300	CA	Red	7-Segment Display	LH	200	1.7	450	O7	Opto-15
27	**MAN73A**	0.300	CA	Red	Overflow ±1 Digit	None	200	1.7	450	O8	Opto-15
28	**MAN74A**	0.300	CC	Red	7-Segment Display	RH	200	1.7	450	O9	Opto-15

* Available 2nd Half, 1978

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7-SEGMENT NUMERIC DISPLAY ARRAYS

Item	DEVICE NO.	Digits	AM/PM	V_F I_F = 8.0 mA V Typ	Luminous Intensity/Seg μcd Typ	@mA	Seg/Seg Match Typ	No. of Pins	Logic/ Connection Diagram	Package No.
1	**FCS6400**	4	No	1.7	200	10	±33%	34	O17	Opto-24
2	**FCS6401**	3½	Yes	1.7	200	10	±33%	34	O18	Opto-25
3	**FCS8000**	3½	Yes	1.65	350	8.0	±33%	34	O11	Opto-17
4	**FCS8024**	4	No	1.65	350	8.0	±33%	34	O12	Opto-18
5	**FNA3420**(3)	4	No	1.7	600	20	±33%	13	—	—
6	**FNA5420**	4	No	1.7	600	20	±33%	13	O13	Opto-20
7	**FNA5421**	3½	No	1.7	600	20	±33%	13	O14	Opto-21
8	**FNA5427**	4	No	1.7	600	20	±33%	13	O13	Opto-20
9	**FNA5428**	3½	No	1.7	600	20	±33%	13	O14	Opto-21
10	**FNA5520**	5	No	1.7	600	20	±33%	14	O15	Opto-22
11	**FNA5521**	4½	No	1.7	600	20	±33%	14	O16	Opto-23
12	**FNA5527**	5	No	1.7	600	20	±33%	14	O15	Opto-22
13	**FNA5528**	4½	No	1.7	600	20	±33%	14	O16	Opto-23

LIQUID CRYSTAL DISPLAYS

Item	DEVICE NO. (1,2)	Description	Digit Height Hr./Min	(mm) s	Logic/Connection Diagram	Package No.
14	**FLC3503-1**	Ladies 3½ Digit	3.3	—	O19	Opto-38
15	**FLC3505-1**	Mens 3½ Digit	4.6	—	O20	Opto-39
16	**FLC3505-2**	Mens 3½ Digit	5.1	—	O21	Opto-40
17	**FLC3507-1**(3)	Mens 3½ Digit	6.7	—	—	—
18	**FLC5505-1**	Mens 5½ Digit	5.1	3.6	O22	Opto-41
19	**FLC5505-3**(3)	Mens 5½ Digit	5.3	3.8	—	—
20	**FLC6005-2**	Mens 6 Digit	4.6	3.1	O23	Opto-42
21	**FLC6005-3**(3)	Mens 6 Digit	4.5	3.1	—	—
22	**FLC8004-1**(3)	8 Digit Calculator	3.5	—	—	—
23	**FLC8006-1**(3)	8 Digit Calculator	6.0	—	—	—

1. With polarizers attached, device code is followed by -P.
2. Electrical Characteristics:

Operating voltage range	3V to 6V
Visual threshold voltage (90% on)	2.8V Max
Operating frequency range	25Hz to 1KHz
Operating temperature range	-10° to 80°C

3. Consult factory.

OPTO

COUPLERS—TRANSISTOR OUTPUT

Item	DEVICE NO.	MAX RATINGS @ T_A = 25°C					
			Transistor		Diode		
		P_D mW	I_C mA	V_{CEO} V	V_R V	I_F mA	V_{ISO} kV
1	FCD810 (1)	250	25	20	3.0	60	1.5ac
2	FCD810A (1)	250	25	20	3.0	60	1.5
3	FCD810B (1)	250	25	20	3.0	60	2.5
4	FCD810C (1)	250	25	20	3.0	60	5.0
5	FCD810D (1)	250	25	20	3.0	60	6.0
6	FCD820 (1,3)	250	25	30	3.0	60	1.5ac
7	FCD820A (1)	250	25	30	3.0	60	1.5
8	FCD820B (1)	250	25	30	3.0	60	2.5
9	FCD820C (1)	250	25	30	3.0	60	5.0
10	FCD820D (1)	250	25	30	3.0	60	6.0
11	FCD825 (1,5)	250	25	30	3.0	60	1.5ac
12	FCD825A (1,5)	250	25	30	3.0	60	1.5
13	FCD825B (1,5)	250	25	30	3.0	60	2.5
14	FCD825C (1,5)	250	25	30	3.0	60	5.0
15	FCD825D (1,5)	250	25	30	3.0	60	6.0
16	FCD830 (2,3)	250	25	30	3.0	60	1.5
17	FCD830A (2)	250	25	30	3.0	60	1.5ac
18	FCD830B (2)	250	25	30	3.0	60	2.5
19	FCD830C (2)	250	25	30	3.0	60	5.0

1. Standard transistor output
2. High speed transistor output
   guaranteed 2.0 μs max t_r and t_f with 100 Ω R_L
   8.0 μs typ at 1K Ω R_L
3. CTR guaranteed with transistor in saturation
4. JEDEC registered data and conditions
5. CTR typ at 1.0mA = 40%

	COUPLED CHARACTERISTICS				INPUT DIODE CHARACT.		OUTPUT TRANSISTOR CHARACT.				
	Min Current Transfer Ratio I_C/I_F %	@ I_F mA	@ V_{CE} V	t_r, t_f μs Typ	V_F V Max	@ I_F mA	V_{CE}(sat) V Max	@ I_C mA	@ I_F mA	Logic/ Connection Diagram	Package No.
	10	10	10	4.0	1.5	10	0.7	2.6	50	O24	Opto-37
	10	10	10	4.0	1.5	10	0.7	2.6	50	O24	Opto-37
	10	10	10	4.0	1.5	10	0.7	1.6	50	O24	Opto-37
	10	10	10	4.0	1.5	10	0.7	2.6	50	O24	Opto-37
	10	10	10	4.0	1.5	10	0.7	2.6	50	O24	Opto-37
	20	10	0.4	2.5	1.5	60	0.4	2.0	10	O24	Opto-37
	20	10	10	2.5	1.5	60	0.4	2.2	15	O24	Opto-37
	20	10	10	2.5	1.5	60	0.4	2.2	15	O24	Opto-37
	20	10	10	2.5	1.5	60	0.4	2.2	15	O24	Opto-37
	20	10	10	2.5	1.5	60	0.4	2.2	15	O24	Opto-37
	50	10	10	3.0	1.5	60	0.4	2.0	10	O24	Opto-37
	50	10	10	3.0	1.5	60	0.4	2.0	10	O24	Opto-37
	50	10	10	3.0	1.5	60	0.4	2.0	10	O24	Opto-37
	50	10	10	3.0	1.5	60	0.4	2.0	10	O24	Opto-37
	50	10	10	3.0	1.5	60	0.4	2.0	10	O24	Opto-37
	20	10	0.4	1.6	1.5	60	0.4	2.0	10	O24	Opto-37
	20	10	10	1.6	1.5	60	0.4	2.2	15	O24	Opto-37
	20	10	10	1.6	1.5	60	0.4	2.2	15	O24	Opto-37
	20	10	10	1.6	1.5	60	0.4	2.2	15	O24	Opto-37

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OPTO

COUPLERS—TRANSISTOR OUTPUT (Cont'd)

Item	DEVICE NO.	MAX RATINGS @ T_A = 25°C					
			Transistor		Diode		
		P_D mW	I_C mA	V_{CEO} V	V_R V	I_F mA	V_{ISO} kV
1	FCD830D (2)	250	25	30	3.0	60	6.0
2	FCD831 (2)	250	25	30	3.0	60	1.5ac
3	FCD831A (2)	250	25	30	3.0	60	1.5
4	FCD831B (2)	250	25	30	3.0	60	2.5
5	FCD831C (2)	250	25	30	3.0	60	5.0
6	FCD831D (2)	250	25	30	3.0	60	6.0
7	FCD836 (2)	250	25	20	3.0	60	1.5ac
8	FCD836C (2)	250	25	20	3.0	60	5.0
9	FCD836D (2)	250	25	20	3.0	60	6.0
10	4N25 (4)	250	—	30	3.0	80	2.5
11	4N26 (4)	250	—	30	3.0	80	1.5
12	4N27 (4)	250	—	30	3.0	80	1.5
13	4N28 (4)	250	—	30	3.0	80	0.5
14	4N35 (4)	400	—	30	6.0	60	3.5
15	4N36 (4)	400	—	30	6.0	60	2.5
16	4N37 (4)	400	—	30	6.0	60	1.5
17	IL1	200	—	30	3.0	150	2.5
18	IL12	200	—	30	3.0	150	1.0
19	IL15	200	—	30	3.0	150	1.5

1. Standard transistor output
2. High speed transistor output
   guaranteed 2.0 μs max t_r and t_f with 100 Ω R_L
   8.0 μs typ at 1K Ω R_L
3. CTR guaranteed with transistor in saturation
4. JEDEC registered data and conditions
5. CTR typ at 1.0mA = 40%

COUPLED CHARACTERISTICS				INPUT DIODE CHARACT.		OUTPUT TRANSISTOR CHARACT.			Logic/ Connection Diagram	Package No.
Min Current Transfer Ratio I_C/I_F %	@I_F mA	@V_{CE} V	t_r, t_f μs Typ	V_F V Max	@I_F mA	$V_{CE(sat)}$ V Max	@I_C mA	@I_F mA		
20	10	10	1.6	1.5	60	0.4	2.2	15	O24	Opto-37
10	10	10	1.6	1.5	60	0.5	2.0	50	O24	Opto-37
10	10	10	1.6	1.5	60	0.5	2.0	50	O24	Opto-37
10	10	10	1.6	1.5	60	0.5	2.0	50	O24	Opto-37
10	10	10	1.6	1.5	60	0.5	2.0	50	O24	Opto-37
10	10	10	1.6	1.5	60	0.5	2.0	50	O24	Opto-37
6.0	10	10	1.6	1.5	20	0.7	2.0	50	O24	Opto-37
6.0	10	10	1.6	1.5	20	0.7	2.0	50	O24	Opto-37
6.0	10	10	1.6	1.5	20	0.7	2.0	50	O24	Opto-37
20	10	10	2.5	1.5	50	0.5	2.0	50	O24	Opto-37
20	10	10	2.5	1.5	50	0.5	2.0	50	O24	Opto-37
10	10	10	2.5	1.5	50	0.5	2.0	50	O24	Opto-37
10	10	10	2.5	1.5	50	0.5	2.0	50	O24	Opto-37
100	10	10	8.0	1.5	10	0.3	0.5	10	O24	Opto-37
100	10	10	8.0	1.5	10	0.3	0.5	10	O24	Opto-37
100	10	10	8.0	1.5	10	0.3	0.5	10	O24	Opto-37
20	10	10	2.0	1.5	60	0.5	1.6	16	O24	Opto-37
10	10	5.0	2.0	1.5	10	0.5	2.0	50	O24	Opto-37
6.0	10	10	2.0	1.5	60	0.5	2.0	50	O24	Opto-37

OPTO

COUPLERS—TRANSISTOR OUTPUT (Cont'd)

Item	DEVICE NO.	MAX RATINGS @ T_A = 25°C					
		P_D mW	Transistor I_C mA	Transistor V_{CEO} V	Diode V_R V	Diode I_F mA	V_{ISO} kV
1	**IL16**	200	—	30	3.0	150	1.5
2	**IL74**	150	—	20	3.0	150	1.5
3	**H11A1**	250	100	30	3.0	60	2.5
4	**H11A2**	250	100	30	3.0	60	1.5
5	**H11A3**	250	100	30	3.0	60	2.5
6	**H11A4**	250	100	30	3.0	60	1.5
7	**MCT2**	250	—	30	3.0	60	1.5
8	**MCT2E**	250	—	30	3.0	60	2.5
9	**MCT26**	250	—	30	3.0	60	1.5
10	**TIL111**(3)	250	—	30	3.0	100	1.5
11	**TIL112**	250	—	20	3.0	100	1.5
12	**TIL114**(3)	250	—	30	3.0	100	2.5
13	**TIL115**	250	—	20	3.0	100	2.5
14	**TIL116**	250	—	30	3.0	100	2.5
15	**TIL117**	250	—	30	3.0	100	2.5
16	**TIL118**	250	—	20	3.0	100	1.5
17	**MOC1000**	250	—	30	3.0	80	1.5
18	**MOC1001**	250	—	30	3.0	80	2.5
19	**MOC1002**	250	—	30	3.0	80	1.5
20	**MOC1003**	250	—	30	3.0	80	0.5

1. Standard transistor output
2. High speed transistor output
   guaranteed 2.0 μs max t_r and t_f with 100 Ω R_L
   8.0 μs typ at 1K Ω R_L
3. CTR guaranteed with transistor in saturation
4. JEDEC registered data and conditions
5. CTR typ at 1.0mA = 40%

COUPLED CHARACTERISTICS				INPUT DIODE CHARACT.		OUTPUT TRANSISTOR CHARACT.			Logic/ Connection Diagram	Package No.
Min Current Transfer Ratio I_C/I_F %	@ I_F mA	@ V_{CE} V	t_r, t_f μs Typ	V_F V Max	@ I_F mA	$V_{CE}(sat)$ V Max	@ I_C mA	@ I_F mA		
6.0	10	10	2.0	1.5	60	0.5	1.6	50	O24	Opto-37
12.5	16	5.0	25.0	—	—	0.5	2.0	16	O24	Opto-37
50	10	10	2.0	1.5	10	0.4	0.5	10	O24	Opto-37
20	10	10	2.0	1.5	10	0.4	0.5	10	O24	Opto-37
20	10	10	2.0	1.5	10	0.4	0.5	10	O24	Opto-37
10	10	10	2.0	1.5	10	0.4	0.5	10	O24	Opto-37
20	10	10	2.5	1.5	20	0.4	2.0	16	O24	Opto-37
20	10	10	2.5	1.5	20	0.4	2.0	16	O24	Opto-37
6.0	10	10	2.0	1.5	20	0.5	1.6	60	O24	Opto-37
12	16	0.4	5.0	1.4	16	0.4	2.0	16	O24	Opto-37
2.0	10	5.0	15.0	1.5	10	0.5	2.0	50	O24	Opto-37
12	16	0.4	5.0	1.4	16	0.4	2.0	16	O24	Opto-37
2.0	10	5.0	15.0	1.5	10	0.5	2.0	50	O24	Opto-37
20	10	10	7.0	1.5	60	0.4	2.2	15	O24	Opto-37
50	10	10	9.0	1.4	16	0.4	0.5	10	O24	Opto-37
10	10	5.0	15.0	1.5	10	0.5	2.0	50	O24	Opto-37
20	10	10	2.8	1.5	50	0.5	2.0	50	O24	Opto-37
20	10	10	2.8	1.5	50	0.5	2.0	50	O24	Opto-37
10	10	10	2.8	1.5	50	0.5	2.0	50	O24	Opto-37
10	10	10	2.8	1.5	50	0.5	2.0	50	O24	Opto-37

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OPTO

COUPLERS—DARLINGTON OUTPUT

Item	DEVICE NO.	MAX RATINGS @ T_A = 25°C					
			Transistor		Diode		
		P_D mW	I_C mA	V_{CEO} V	V_R V	I_F mA	V_{ISO} kV
1	**FCD850**	250	125	30	3.0	80	1.5ac
2	**FCD850C**	250	125	30	3.0	80	5.0
3	**FCD850D**	250	125	30	3.0	80	6.0
4	**FCD855**	250	125	55	3.0	80	1.5ac
5	**FCD855C**	250	125	55	3.0	80	5.0
6	**FCD855D**	250	125	55	3.0	80	6.0
7	**FCD860** (3)	250	125	30	3.0	80	1.5ac
8	**FCD860C** (3)	250	125	30	3.0	80	5.0
9	**FCD860D** (3)	250	125	30	3.0	80	6.0
10	**FCD865** (3)	250	125	30	3.0	80	1.5ac
11	**FCD865C** (3)	250	125	30	3.0	80	5.0
12	**FCD865D** (3)	250	125	30	3.0	80	6.0
13	**4N29** (4)	250	125	30	3.0	80	2.5
14	**4N30** (4)	250	125	30	3.0	80	1.5
15	**4N31** (4)	250	125	30	3.0	80	1.5
16	**4N32** (4)	250	125	30	3.0	80	2.5
17	**4N33** (4)	250	125	30	3.0	80	1.5
18	**H11B1**	250	100	25	3.0	60	2.5
19	**H11B2**	250	100	25	3.0	60	1.5
20	**TIL113** (3)	250	—	30	3.0	100	1.5
21	**TIL119**	250	—	30	3.0	100	1.5
22	**MCA230**	250	—	30	3.0	60	1.5
23	**MCA231** (3)	250	50	30	3.0	60	1.5
24	**MCA255**	250	—	55	3.0	60	1.5

1. Standard transistor output
2. High speed transistor output
   guaranteed 2 μs max t_r and t_f with 100Ω R_L
   8μs typ at 1KΩ R_L
3. CTR guaranteed with transistor in saturation
4. JEDEC registered data and conditions
5. CTR typ at 1.0mA = 40%

COUPLED CHARACTERISTICS					INPUT DIODE CHARACT.		OUTPUT DARLINGTON CHARACT.		Logic/ Connection Diagram	Package No.
Min Current Transfer Ratio I_C/I_F %	@ I_F mA	@ V_{CE} V	t_r µs Typ	t_f µs Typ	V_F V Max	@ I_F mA	I_{CEO} µA Max	@ V_{CE} V		
100	10	5.0	15	150	1.5	20	0.1	10	O24	Opto-37
100	10	5.0	15	150	1.5	20	0.1	10	O24	Opto-37
100	10	5.0	15	150	1.5	20	0.1	10	O24	Opto-37
100	10	5.0	15	150	1.5	20	0.1	10	O24	Opto-37
100	10	5.0	15	150	1.5	20	0.1	10	O24	Opto-37
100	10	5.0	15	150	1.5	20	0.1	10	O24	Opto-37
200	1.0	1.0	80	150	1.5	20	0.1	10	O24	Opto-37
200	1.0	1.0	80	150	1.5	20	0.1	10	O24	Opto-37
200	1.0	1.0	80	150	1.5	20	0.1	10	O24	Opto-37
400	0.5	1.0	80	150	1.5	20	0.1	10	O24	Opto-37
400	0.5	1.0	80	150	1.5	20	0.1	10	O24	Opto-37
400	0.5	1.0	80	150	1.5	20	0.1	10	O24	Opto-37
100	10	10	10	45	1.5	50	0.1	10	O24	Opto-37
100	10	10	10	45	1.5	50	0.1	10	O24	Opto-37
50	10	10	10	45	1.5	50	0.1	10	O24	Opto-37
500	10	10	10	120	1.5	50	0.1	10	O24	Opto-37
500	10	10	10	120	1.5	50	0.1	10	O24	Opto-37
500	1.0	5.0	125	100	1.5	10	0.1	10	O24	Opto-37
200	1.0	5.0	125	100	1.5	10	0.1	10	O24	Opto-37
300	10	1.0	50	50	1.5	10	0.1	10	O24	Opto-37
300	10	2.0	50	50	1.5	10	0.1	10	O24	Opto-37
100	10	5.0	5.0	35	1.5	20	0.1	10	O24	Opto-37
200	5.0	1.0	5.0	35	1.5	10	0.1	10	O24	Opto-37
100	10	5.0	5.0	35	1.5	20	0.1	10	O24	Opto-37

OPTO

PHOTO TRANSISTORS

Item	DEVICE NO.	Description	V_{CEO} I_C = 1.0mA V Min	Typ	$I_{CE(lt)}$ V_{CE} = 5.0V mA Min Typ Max	$V_{CE(sat)}$ H = 20mW/cm^2 V Min Typ Max	t_r/t_f μs Typ	Package No.
1	**FPT100**	Plastic, Dome Lens General Purpose	30	50	H = 5.0mW/cm^2 0.2 1.4 —	I_C = 500μA — 0.16 0.3	2.8	Opto-26
2	**FPT100A**	Plastic, Dome Lens 1:3 Sensitivity	30	50	H = 5.0mW/cm^2 1.0 1.4 3.0	I_C = 500μA — 0.16 0.3	2.8	Opto-26
3	**FPT100B**	Plastic, Dome Lens 1:2 Sensitivity	30	50	H = 5.0mW/cm^2 1.3 1.4 2.6	I_C = 500μA — 0.16 0.3	2.8	Opto-26
4	**FPT101**	Miniature, .080" Dia. Hermetic Package	I_C = 0.1mA, H ≤ 0.1μW/cm^2 30	60	H = 20mW/cm^2 0.8 3.5 —	I_C = 0.4mA — 0.25 0.3	2.8	Opto-27
5	**FPT102**	Photodiode Hermetic Package	I_R = 5.0μA, H ≤ 0.1μW/cm^2 50	120	V_R = -10.0V, H ≤ 0.1μW/cm^2 — 0.1nA 25nA	V_R = -10V 12μA 20μA —	0.2	Opto-27
6	**FPT110**	Plastic Flat Lens General Purpose	30	50	H = 5.0mW/cm^2 0.2 0.88 —	I_C = 500μA — 0.16 0.33	2.8	Opto-28
7	**FP110A**	Plastic Flat Lens 1:3 Sensitivity	30	50	H = 5.0mW/cm^2 0.6 0.88 1.8	I_C = 500μA — 0.16 0.33	2.8	Opto-28
8	**FPT110B**	Plastic Flat Lens 1:2 Sensitivity	30	50	H = 5.0mW/cm^2 0.8 0.88 1.6	I_C = 500μA — 0.16 0.33	2.8	Opto-28
9	**FPT120**	Plastic, Dome Lens High Sensitivity	20	50	H = 1.0mW/cm^2 0.4 1.5 —	I_C = 1.0mA — 0.25 0.55	18	Opto-26
10	**FPT120A**	Plastic, Dome Lens 1:3 Sensitivity	15	30	H = 1.0mW/cm^2 1.5 2.4 4.5	I_C = 1.0mA — 0.25 0.55	18	Opto-26
11	**FPT120B**	Plastic, Dome Lens 1:1.5 Sensitivity	15	30	H = 1.0mW/cm^2 2.0 2.4 4.0	I_C = 1.0mA — 0.25 0.55	18	Opto-26
12	**FPT120C**	Plastic Cup, Dome Lens	11	20	H = 5.0mW/cm^2 16 — 25	I_C = 1.0mA — 0.35 0.55	18	Opto-26
13	**FPT130**	Plastic, Flat Lens High Sensitivity	20	50	H = 1.0mW/cm^2 0.4 0.9 —	I_C = 1.0mA — 0.25 0.55	18	Opto-28
14	**FPT130A**	Plastic, Flat Lens 1:3 Sensitivity	15	30	H = 1.0mW/cm^2 0.9 1.5 2.7	I_C = 1.0mA — 0.25 0.55	18	Opto-28
15	**FPT130B**	Plastic, Flat Lens 1:2 Sensitivity	15	30	H = 1.0mW/cm^2 1.2 1.5 2.4	I_C = 1.0mA — 0.25 0.55	18	Opto-28
16	**FPT131**	Plastic, Dome Lens	15	50	H = 5.0mW/cm^2 0.1 1.4 —	I_C = 500μA — 0.16 0.7	2.8	Opto-26
17	**FPT132**	Plastic, Dome Lens	10	30	H = 1.0mW/cm^2 0.2 1.5 —	I_C = 1.0mA — 0.15 0.7	18	Opto-26
18	**FPT136**	Plastic, Flat Lens	15	50	H = 5.0mW/cm^2 0.1 0.88 —	I_C = 500μA — 0.16 0.7	2.8	Opto-28

OPTO

PHOTO TRANSISTORS (Cont'd)

Item	DEVICE NO.	Description	V_{CEO} $I_C = 1.0mA$ V Min	Typ	$I_{CE(lt)}$ $V_{CE} = 5.0V$ mA Min Typ Max	$V_{CE(sat)}$ $H = 20mW/cm^2$ V Min Typ Max	t_r/t_f μs Typ	Package No.
1	**FPT137**	Plastic, Flat Lens	10	30	$H = 1.0mW/cm^2$ 0.2 0.9 —	$I_C = 1.0mA$ — 0.15 0.7	18	Opto-28
2	**FPT220**	Plastic, Dome Lens 1:2 Sensitivity	20	50	$H = 1.0mW/cm^2$ 1.0 1.5 2.0	$I_C = 1.0mA$ — 0.25 0.55	18	Opto-26
3	**FPT230**	Plastic Flat Lens 1:2 Sensitivity	20	50	$H = 1.0mW/cm^2$ 0.6 0.9 1.2	$I_C = 1.0mA$ — 0.25 0.55	18	Opto-28
4	**FPT320**	Plastic, Dome Lens 1:3 Sensitivity	20	50	$H = 1.0mW/cm^2$ 0.75 1.5 2.25	$I_C = 1.0mA$ — 0.25 0.55	18	Opto-26
5	**FPT330**	Plastic, Flat Lens 1:3 Sensitivity	20	50	$H = 1.0mW/cm^2$ 0.45 0.9 1.35	$I_C = 1.0mA$ — 0.25 0.55	18	Opto-28
6	**FPT400**	Plastic, Dome Lens Photo Darlington	30	50	$H = 1.0mW/cm^2$ 7.5 12 —	— 0.9 1.0	100	Opto-26
7	**FPT410**	Plastic, Flat Lens Photo Darlington	30	50	$H = 1.0mW/cm^2$ 5.0 8.0 —	— 0.9 1.0	100	Opto-28
8	**FPT500**	TO-18, Dome Lens	45	60	$H = 1.0mW/cm^2$ 1.0 — —	— 0.2 0.33	3.0	Opto-29
9	**FPT500A**	TO-18, Dome Lens 1:3 Sensitivity	45	60	$H = 1.0mW/cm^2$ 2.0 — 6.0	— 0.2 0.33	3.0	Opto-29
10	**FPT510**	TO-18, Flat Lens	45	60	$H = 5.0mW/cm^2$ 0.5 — —	— 0.2 0.33	3.0	Opto-30
11	**FPT510A**	TO-18, Flat Lens 1:3 Sensitivity	45	60	$H = 5.0mW/cm^2$ 1.0 — 3.0	— 0.2 0.33	3.0	Opto-30
12	**FPT520**	TO-18, Dome Lens	30	50	$H = 1.0mW/cm^2$ 5.0 — —	— 0.2 0.33	10	Opto-29
13	**FPT520A**	TO-18, Dome Lens 1:3 Sensitivity	30	50	$H = 1.0mW/cm^2$ 6.0 — 18	— 0.2 0.33	10	Opto-29
14	**FPT530**	TO-18, Flat Lens	30	50	$H = 5.0mW/cm^2$ 3.0 — —	— 0.2 0.33	10	Opto-30
15	**FPT530A**	TO-18, Flat Lens 1:3 Sensitivity	30	50	$H = 5.0mW/cm^2$ 4.0 — 12	— 0.2 0.33	10	Opto-30
16	**FPT540**	TO-18, Dome Lens	12	20	$H = 1.0mW/cm^2$ 8.0 — —	— 0.35 0.55	18	Opto-29
17	**FPT540A**	TO-18, Dome Lens 1:3 Sensitivity	12	20	$H = 1.0mW/cm^2$ 10 — 30	— 0.35 0.55	18	Opto-29
18	**FPT550**	TO-18, Flat Lens	12	20	$H = 5.0mW/cm^2$ 8.0 — —	— 0.35 0.55	18	Opto-30

4

OPTO

PHOTO TRANSISTORS (Cont'd)

Item	DEVICE NO.	Description	V_{CEO} $I_C = 1.0mA$ V Min	Typ	$I_{CE(lt)}$ $V_{CE} = 5.0V$ mA Min Typ Max	$V_{CE(sat)}$ $H = 20mW/cm^2$ V Min Typ Max	t_r/t_f µs Typ	Package No.
1	**FPT550A**	TO-18, Flat Lens 1:3 Sensitivity	12	20	$H = 5.0mW/cm^2$ 8.0 — 24	— 0.35 0.55	18	Opto-30
2	**FPT560**	TO-18, Dome Lens Photo Darlington	30	50	$H = 0.5mW/cm^2$ 10 15 —	— 0.9 1.0	100	Opto-29
3	**FPT570**	TO-18, Flat Lens Photo Darlington	30	50	$H = 0.5mW/cm^2$ 1.0 6.0 —	— 0.9 1.0	100	Opto-30
4	**FPT610**	Miniature, .085" x .150"	30	50	$H = 5.0mW/cm^2$ 0.2 1.4 —	$I_C = 500\mu A$ — 0.16 0.3	2.8	Opto-31
5	**FPT630**	X .095" Tall Flat Lens	20	50	$H = 1.0mW/cm^2$ 0.4 0.9 —	$I_C = 1.0mA$ — 0.25 0.55	18	Opto-31

INFRARED EMITTERS

Item	DEVICE NO.	Description	I_F mA Max	V_F $I_F = 100mA$ V Typ	Wave Length @ Peak Emission nm Typ	Axial Intensity $I_F = 100mA$ mW/sr Typ	Package No.
6	**FPE100**	Metal Header Package Wide Beam	100	1.35	890	0.3	Opto-32
7	**FPE104**	Lead Frame Package Narrow Beam	100	1.35	890	10	Opto-8
8	**FPE106**	Miniature .085" x .150" x .095" Tall Flat Lens	100	1.35	890	0.4	Opto-31
9	**FPE500**	TO-18, Dome Lens	250	1.35	890	10.0	Opto-29
10	**FPE510**	TO-18, Flat Lens	250	1.35	890	1.0	Opto-30
11	**FPE520**	TO-18, Dome Lens	250	1.35	940	50	Opto-29
12	**FPE530**	TO-18, Flat Lens	250	1.35	940	5.0	Opto-30

OPTO

SOURCE/SENSOR ARRAYS

Item	DEVICE NO.	Description	Source I_F mA/cell Max	Source V_F I_F = 50mA V Typ	Sensor $I_{CE(lt)}$ H = 1.0mW/cm^2 (GaAs) V_{CE} = 5.0V mA Typ	Sensor $V_{CE(sat)}$ I_{CE} = 4.0mA V Typ	Matching Factor $\frac{I_{OUT(Min)}}{I_{OUT(Max)}}$ I_F = 50mA, V_{CE} = 5.0V distance = 0.05" Min	Matching Factor Typ	Package No.
1	**FPA100**	9-Element Source/ Sensor Array 0.100" Centers	75	1.25	4.5	0.4	0.5	0.65	Opto-33 (2 pcs.)
2	**FPA101**	12-Element Source/ Sensor Array 0.250" Centers	75	1.25	4.5	0.4	0.5	0.65	Opto-34 (2 pcs.)
3	**FPA102**	10-Element Source/ Sensor Array 0.087" Centers	75	1.25	4.5	0.4	0.5	0.65	Opto-35 (2 pcs.)

SENSOR ARRAYS

Item	DEVICE NO.	Description	I_{CE} mA Max	V_{CEO} I_C = 1.0mA V Typ	$I_{CE(lt)}$ H=10mW/cm^2 Tung.@2854°K mA Typ	$V_{CE(sat)}$ H=20mW/cm^2 I_C = 500mA V Typ	Matching Factor $\frac{I_{OUT(Min)}}{I_{OUT(Max)}}$ I_F = 50mA, V_{CE} = 5.0V distance = 0.05" Min	Matching Factor Typ	Package No.
4	**FPA700**	9-Element Sensor Array 0.100" Centers	25	20	1.75	0.16	0.5	0.65	Opto-33
5	**FPA700A**	9-Element Sensor Array 0.100" Centers	25	20	1.75	0.16	0.75	0.85	Opto-33
6	**FPA710**	12-Element Sensor Array 0.250" Centers	25	20	1.75	0.16	0.5	0.65	Opto-34
7	**FPA710A**	12-Element Sensor Array 0.250" Centers	25	20	1.75	0.16	0.75	0.85	Opto-34
8	**FPA720**	10-Element Sensor Array 0.087" Centers	25	20	1.75	0.16	0.5	0.65	Opto-35
9	**FPA720A**	10-Element Sensor Array 0.87" Centers	25	20	1.75	0.16	0.75	0.85	Opto-35

OPTO

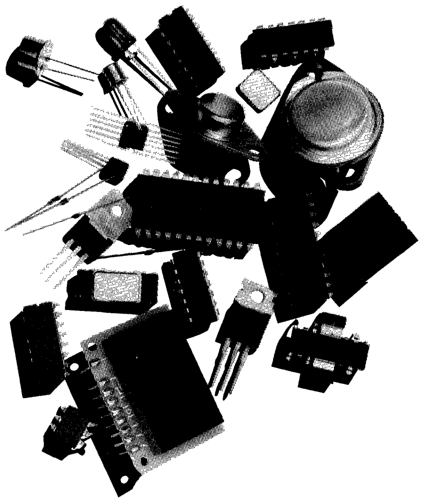
REFLECTIVE SENSORS

Item	DEVICE NO.[1]	Description	Diode I_F mA Max	Diode V_F I_F = 20mA V Typ	Photo-Transistor V_{CEO} I_{CE} = 1.0mA V Min	Combined I_{OUT} I_F = 50mA, V_{CE} = 5V distance = .40" µA Min	Combined I_{OUT} µA Max	Package No.
1	**FPA103/106**	Light Reflective Transducer	75	1.25	12	20	—	Opto-36
2	**FPA104/107**	Light Reflective Transducer	75	1.25	12	60	180	Opto-36
3	**FPA105/108**	Light Reflective Transducer	75	1.25	12	80	160	Opto-36

DICE

Item	DEVICE NO.	Die Size Inches	Description
4	**FLX2121**	.015 x .015	A high-efficiency, long life red GaAsP LED. Typical luminous intensity = 0.7 mcd @ V_F = 1.7 V and I_F = 20 mA.
5 6 7 8	**FNX8019** **FNX8009** **FNX8039** **FNX8041**	.116 x .070 .100 x .062 .080 x .049 .040 x .026	GaAsP monolithic 7/9 segment display with a 5° slant. Dimensions given are digit sizes—die is larger by .008" vertical and no more than .016" in horizontal direction. Half digits (numeral-one) are available for the 0.100", and 0.116" display. The FNX8019, 8009 and 8039 are 9-segment and can be used as 7-segment. The other is 7-segment only.
9	**FNX8209**	.050 x .063	A current-sinking digit driver for common-cathode LED displays. The monolithic chip contains four independent npn transistors, each capable of sinking 63 mA with I_B = 1.0 mA.
10	**FPX1010**	.040 x .040	An npn Planar [2] phototransistor, h_{FE} = 100 Min; V_{CEO} = 30 V Min; V_{CBO} = 50 V Min; $I_{CE(lt)}$ = 0.3 mA Min @ H = 5.0 mW/cm^2 (tungsten @ 2854° K); typical t_r and t_f = 3.0 µs @ I_{CE} = 4.0 mA and R_L = 100 Ω; $V_{CE(sat)}$ = 0.4 V Max @ I_C = 500 µA.
11	**FPX1011**	.040 x .040	An npn Planar phototransistor with high illumination sensitivity h_{FE} = 500 Min; V_{CEO} = 12 V Min; V_{CBO} = 30 V Min; $I_{CE(lt)}$ = 0.3 mA Min @ H = 1.0 mW/cm^2 (tungsten @ 2854° K), typical t_r and t_f = 18 µs @ I_{CE} = 4.0 mA and R_L = 100 Ω; $V_{CE(sat)}$ = 0.5 V Max @ I_C = 500 µA.

1. FPA 106, 107, 108 have infrared filters.
2. Planar is a patented Fairchild process.



CCD

LINEAR IMAGE SENSORS

A typical linear image sensor is composed of a row of image sensing elements (photosites), two analog transport registers, and an output amplifier *(Figure 1)*. Light energy falls on the photosites and generates charge packets proportional to the light intensity. These charge packets are then transferred in parallel to two analog transport registers, which are clocked by 2-phase clocks. The packets are next delivered to an on-chip output amplifier where they are converted to proportional voltage levels. A series of pulses, amplitude modulated with the optical information, appear at the output.

Table 1 summarizes the features of the CCD110F 256-element, CCD131 1024-element and CCD121H 1728-element linear image sensors. The CCD110F and CCD121H have similar cell size and number of output amplifiers. The CCD131 has two separate output amplifiers, one for each 512-stage analog transport register, which permit higher total output data rate. The linear image sensors are packaged in hermetically sealed ceramic packages with a high quality optical glass window.

Linear sensors find applications ranging from simple optical character recognition (OCR) using the 256 x 1 device to high speed facsimile sensing using the 1728 x 1. The precise location of the photosites on the sensors allows the device to be used in high precision non-contact measurement applications such as dimensional measurements of objects, shape recognition and sorting, defect detection and so on. The three linear sensors have the same sensing element center-to-center spacing; selection is determined by the user's resolution requirement.

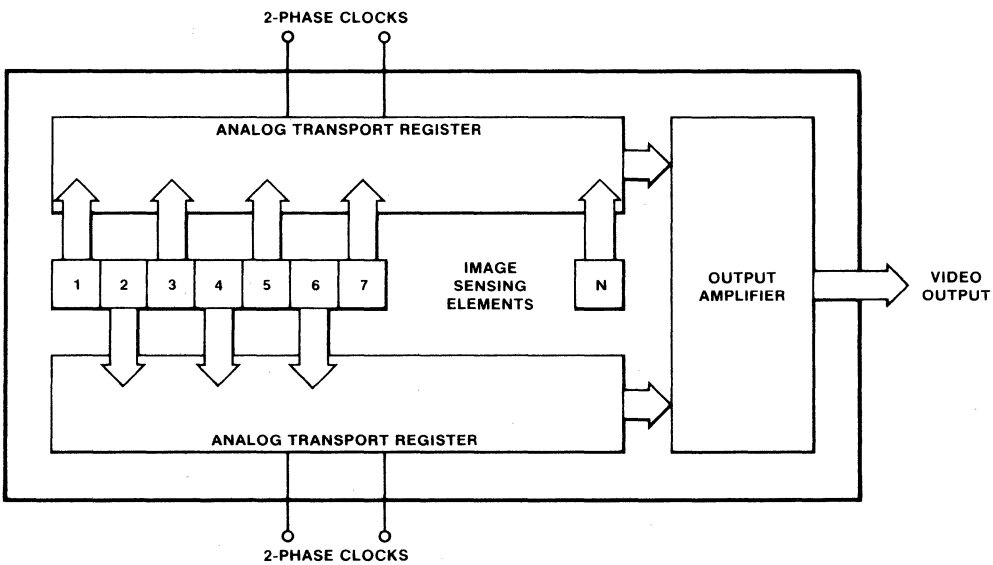


Fig. 1. Typical Block Diagram for a Linear Image Sensor

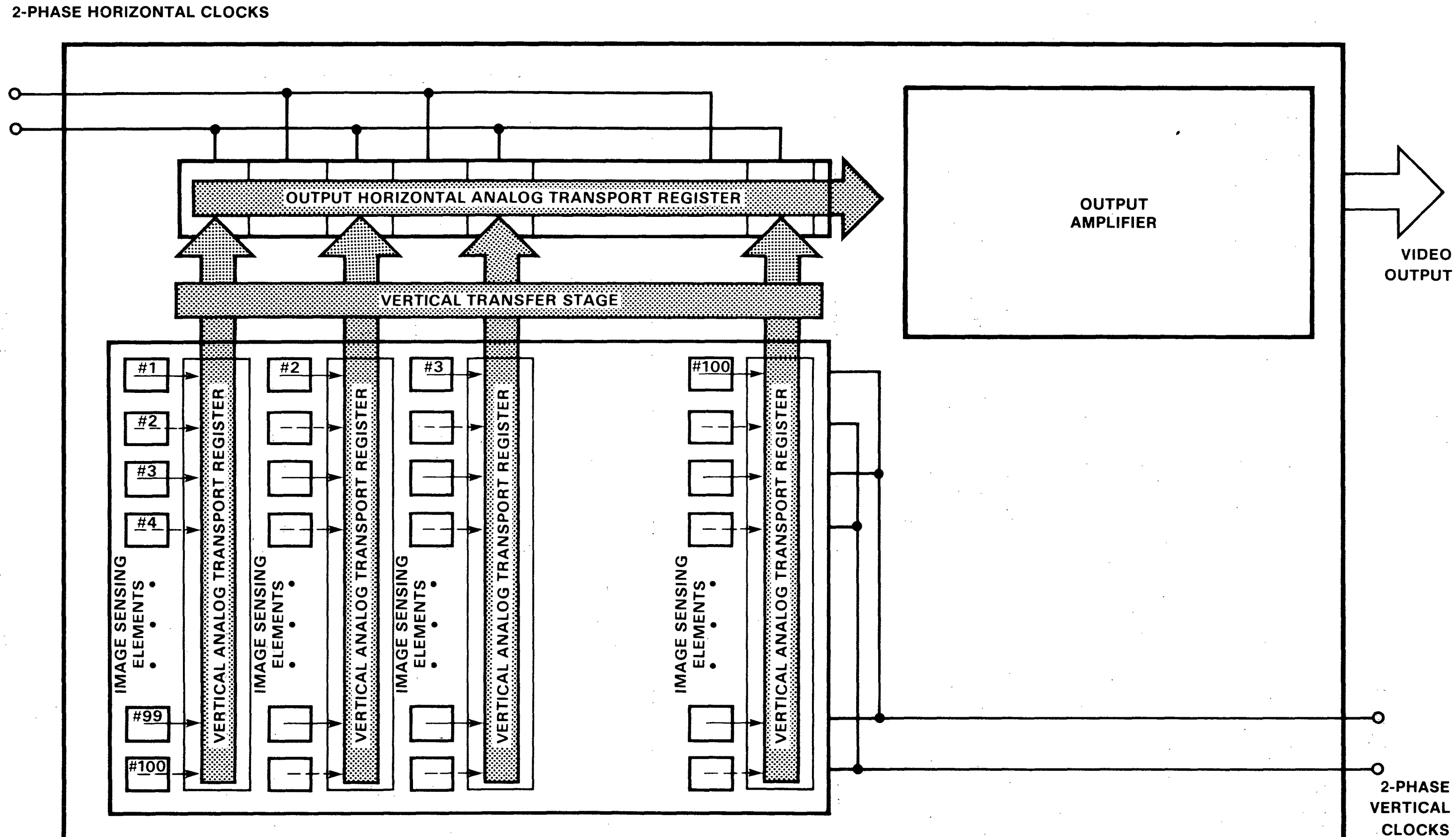


Fig. 2. Typical Block Diagram of an Area Image Sensor

PARAMETERS	CCD110F	CCD131	CCD121H
Number of Elements	256	1024	1728
Dynamic Range	500:1	500:1	500:1
Number of Output Amplifiers	1	2	1
Package Type	Non-Hermetic	Hermetic	Hermetic
Number of Pins	18	24	24
Saturation Exposure	1.0 $\mu J/cm^2$	1.0 $\mu J/cm^2$	1.0 $\mu J/cm^2$
Saturation Output Voltage	150 mV	750 mV	750 mV
Photo Element Dimensions	13 μ X 17 μ	13 μ X 13 μ	13 μ X 17 μ
Video Data Rate	10 MHz	24 MHz	10 MHz
Design Development Board	**CCD110FB**	**CCD131DB**	**CCD121HB**

Table 1. Linear Image Sensors

PARAMETERS	CCD202	CCD211
Number of Elements	100 X 100	244 X 190
Dynamic Range	300:1	300:1
Package Type	Hermetic	Hermetic
Number of Pins	24	24
Saturation Exposure	0.4 $\mu J/cm^2$	0.2 $\mu J/cm^2$
Saturation Output Voltage	1,600 mV	200 mV
Photoelements Dimensions	18 μm X 30 μm	14 μm X 18 μm
Video Data Rate	2 MHz	7 MHz
Design Development Boards	**CCD202DB**	—

Table 2. Area Image Sensors

AREA IMAGE SENSORS

Area arrays are similar to the linear sensors except that the photosites are arranged in a matrix format and the opaque transport registers are located between the photosite columns *(Figure 2)*. The charge packets are transferred to the output amplifier in two separate fields, line by line. This technique is called the interline transfer approach.

Table 2 summarizes the features of the CCD202 100 x 100 element and CCD211 244 x 190 element devices. The x-y format of the area sensors was selected to provide a 4 x 3 image aspect ratio. The highly precise location of the photosites allows precise identification of each component of the image signal, an important feature for applications requiring exact dimensional measurements. The devices are also well suited for use in video cameras that require low power, small size, high sensitivity and high reliability. Both devices are packaged in a hermetically sealed package with a high quality optical glass window.

ANALOG SHIFT REGISTERS

The capability to manipulate information in the form of charge packets makes CCD technology ideal for analog signal processing. In a CCD analog shift register, electrical inputs are applied to the charge-injection port which samples the input signal at a rate determined by the input signal bandwidth.

This signal is then transformed into a charge packet and injected into the register. The clocks shift the charge packet through the register to the output amplifier for conversion to an output signal voltage. A filtering or sample-and-hold technique is usually required to recover the analog information. The time delay between the input and output signals is equal to the number of elements in the CCD register (N) divided by the clock rate frequency. Since N is fixed, varying the clock rate provides a variable delay that makes the CCD shift register a powerful device for applications requiring highly precise delay of analog information.

FAIRCHILD CHARGE-COUPLED DEVICES

Figure 3 shows a typical block diagram for a CCD analog shift register. *Table 3* summarizes the features of the CCD311 130/260-element device and the CCD321A 455/910-element device. The CCD321A is capable of storing one full horizontal line of video information (1H) at a 14.3 MHz data rate. The device finds applications in a wide number of video applications as replacement for glass delay lines. Such systems include comb filters, signal-to-noise enhancers and drop-out compensators for videotape recorders. Other types of applications include time-base compression and expansion systems where data can be fed to the device at one speed and fed out of the device at a different speed. Preprocessing the analog data through a CCD321A eliminates the need for expensive high speed A-to-D converters in these applications. Finally, the device can also be used in audio systems for echo-effect simulations, reverberation systems, etc.

The CCD321A comes in four different classes—the CCD321A-1 for high quality video applications, the CCD321A-2 for medium quality video applications, the CCD321A-3 for general purpose time-base compression and expansion applications and the CCD321A-4 for audio applications.

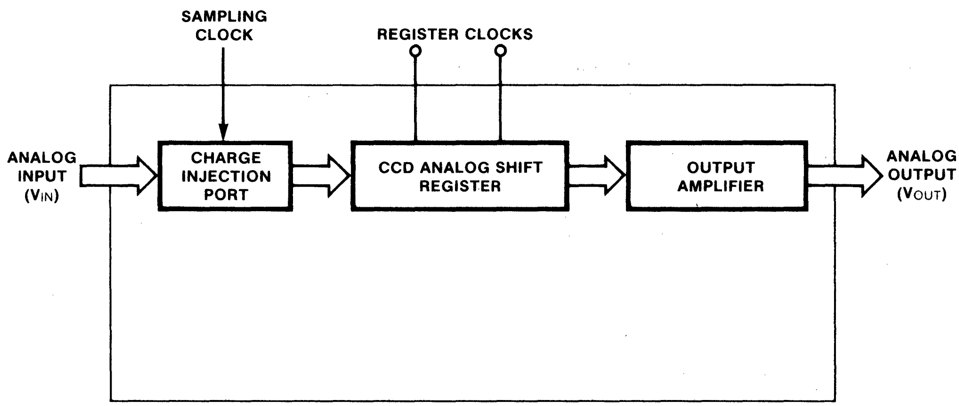


Fig. 3. Typical Block Diagram for an Analog Shift Register

PARAMETERS	CCD311	CCD321A
Number of Elements	130 or 260	455 or 910 (Dual 455)
Number of Charge Injection Ports	2	2
Number of Outputs	1	2
Range of Clock Rates	20 KHz - 10 MHz	20 KHz - 40 MHz
Number of Pins	18	16
Signal to Noise Ratio	50 db	58 db
Video Signal Bandwidth	4.2 MHz	5.0 MHz
Differential Gain	3%	1% to 3%
Differential Phase	3°	1° to 3°
Total Harmonic Distortion	3%	<1%

Table 3. Analog Shift Registers

DESIGN DEVELOPMENT BOARDS AND MODULES

Fairchild offers a series of printed circuit boards for use as construction aids for experimental systems using CCD linear and area image sensors. These design development boards are fully assembled and tested, and require only power supplies and an oscilloscope to display the video information corresponding to the image positioned in front of the sensor. A typical board *(Figure 4)* includes an on-board variable-frequency clock generator that can be overrun by an external input, logic circuitry for timing drive signals, drivers to interface the TTL logic to CCD levels, a socket for mounting the device at 90° on the edge of the board, video buffer circuits and simple video processing electronics. Design development boards are available for the CCD110F, CCD131, CCD121H and the CCD202.

To operate the board, supply +5 V, +15 V and -15 V through a 22-pin standard edge connector to the pc board. Video information, typically 1.0 V peak-to-peak, as well as synchronization pulses are supplied to the connector for display on an oscilloscope. The CCD202 board also includes sweep waveform generators for driving an x-y monitor.

In addition, Fairchild offers the CCD321VM video delay module which includes the CCD321A-2 analog shift register plus driver electronics package with VCO, drivers, device socket, video amplifiers and filters. A 1.0 V peak-to-peak input comes out 1.0 V peak-to-peak, delayed by 455 or 910 divided by the clock frequency. The CCD321VM module is capable of storing a full video line (1H) at a 14.3 MHz clock rate with a 58 dB signal-to-noise ratio and excellent linearity. Assembled and thoroughly tested, the module requires only a single power supply. Also available is the CCD321AM audio module which includes the CCD321A-4 plus driver package and processing electronics.

5

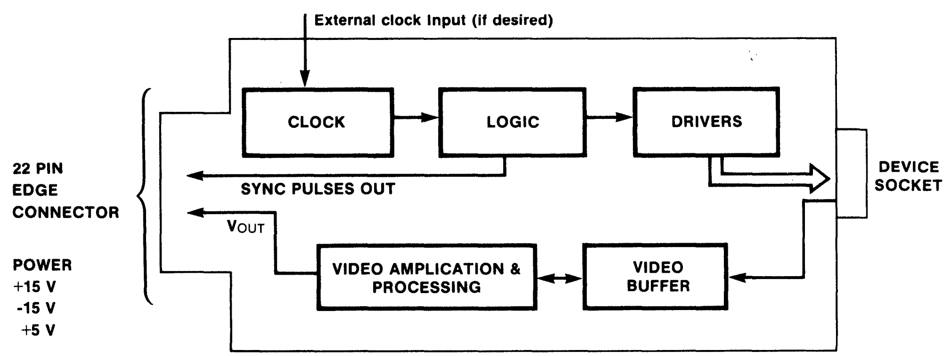


Fig. 4. Typical Block Diagram for a CCD Printed Circuit Board

LINE-SCAN CAMERA SUBSYSTEMS

There are presently three models of the line-scan camera sub-systems—the 256-element CCD1100, the 1024-element CCD1300 and the 1728-element CCD1400. The choice among them is determined primarily by resolution requirements, since each camera model offers essentially equivalent performance in other respects. The line-scan camera can be ordered with a C-mount lens with a focal length to meet the specific application.

Each camera subsystem includes a line-scan camera, a camera-control unit and interconnecting cables. Within the camera is a CCD image sensor, a logic board to provide clock signals for controlling sensor operation, and a video processing assembly to generate an analog-video and a binary-video output signal. The analog-video signal is a continuous analog representation of the spacial distribution of image brightness, obtained by sample-and-hold processing of the raw sensor output. The binary-video output, provided by a comparator, is a digital version of the analog video waveform and corresponds to black-to-white and white-to-black transitions of the analog-video signal across the threshold. The threshold adjustment can be varied across the full dynamic range of the camera.

The camera-control unit provides the power supply voltages and interface connections for the subsystem input and output signals. It also contains the adjustment controls for camera exposure time, video data rate, the threshold voltage for the binary-video comparator, and an AGC off-on switch. The camera-to-control interconnection cable permits complete remote control of the camera by the control unit. Emulation of the control unit signals permits camera control by microcomputer.

CCD line-scan camera subsystems are being used for non-contact measurement, inspection, defect detection, shape and pattern recognition, color sorting, and for a wide variety of quality process-control industrial applications.

PIXEL LOCATOR

The pixel locator is an optional accessory for use with any of the Fairchild standard product line-scan camera subsystems; the 256-element CCD1100, the 1024-element CCD1300 or the 1728-element CCD1400. It is a single printed circuit board which is installed in a 3" x 6" x 10" enclosure designed as a companion to the line-scan camera control unit. All required bias-voltage and camera-signal input connections are made by a single 15-wire cable which is provided for interconnection between the pixel locator and control unit. A mating 50-pin connector is provided to allow user construction of a cable for accessing of the pixel locator I/O ports.

The primary electrical function of the pixel locator is generation of a set of digit output data words which indicate the pixel address locations where white-to-black and black-to-white transitions occur in the binary video signal from the associated line-scan camera. A pixel is a "picture element," which physically corresponds to a discrete photosite in the CCD image sensor in the camera. There are 256 pixels (hence 256 corresponding pixel addresses) in the CCD1100 camera, 1024 pixels in the CCD1300 and 1728 pixels in the CCD1400.

First-in first-out buffer memory storage provided for the set of address words detected by the pixel locator allows the users system to access address data at any rate up to 2M words per second. The sequentially available set of digital address output words permits many non-contract measurement application problems to be resolved with simple binary subtraction or digital display circuitry.

As a secondary function, the pixel locator also provides an 8-bit output word to indicate the number of video signal transitions detected in a proceeding camera line-scan readout.

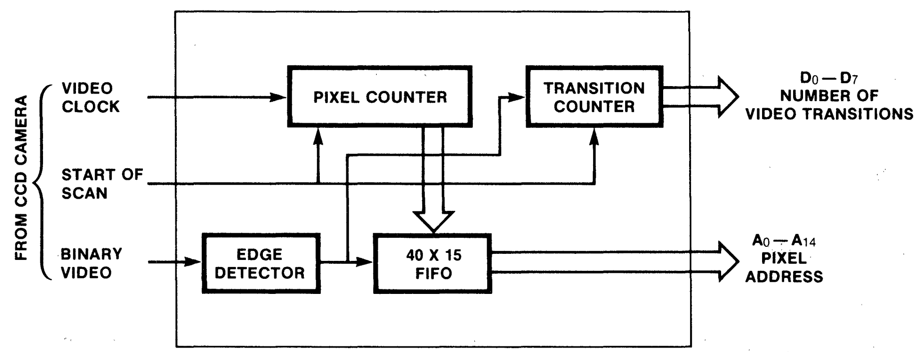
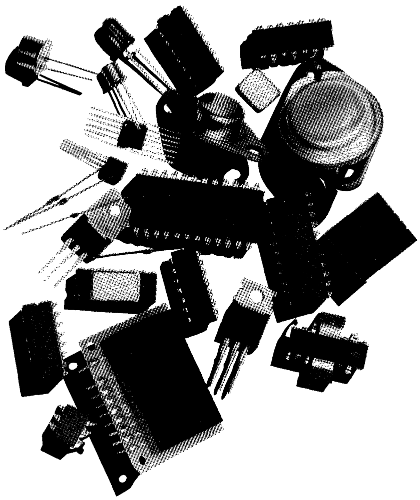


Fig. 5. Pixel Locator Block Diagram



INTERFACE

HIGH CURRENT DRIVERS

Item	DEVICE NO.	Description	Function	Input Compatibility	Output Current A (Max)	Output Standoff Voltage-V	Drivers per Package	Logic/Connection Diagram	Package(s)
1	**SH2001**	High Voltage, High Current	NAND	DTL,TTL	1.0	50	1	H5	TO-100
2	**SH2002**	High Voltage, High Current	NAND	DTL,TTL	1.0	40	1	H5	TO-100
3	**SH2200**	High Voltage, High Current	NAND	DTL,TTL	2.0	50	1	H5	TO-100
4	**SH2201**	High Voltage, High Current	NAND	DTL,TTL	2.0	100	1	H5	TO-100
5	**SH3011***	Dual Hammer	Non-Inverting	TTL	5.0	80	2	H8	8-pin TO-3

ANALOG SWITCHES

Item	DEVICE NO.	Description	Input Logic	Channel Resistance Ω (Max)	Supply Voltage V	Logic/Connection Diagram	Package(s)
6	**SH3002**	SPDT Analog Switch	TTL	200	±12	H6	TO-100
7	**SH3003**	DPST Analog Switch	TTL	200	±12	H7	TO-100

CONSUMER

RADIO-AUDIO/TV CIRCUITS

Item	DEVICE NO.	Description	Logic/Connection Diagram	Package(s)
4	**SH1549**	Memory Control Hybrid	H4	1"x2" Single In-line
5	**SH1552**	Ladder Network for Signal Conversion	H3	1"x2" Single In-line
6	**SH3006***	Wideband Amplifier/Prescaler	—	—

*To be announced

6

VOLTAGE REGULATORS

VOLTAGE REGULATORS

Item	DEVICE NO.	Description	Input Voltage Range-V	Output Voltage Range-V	Output Current A (Max)	Output Current Peak A (Typ)
1	**SH123**	3 Term. Pos. VR	7.5 to 25	5.0	3.0	8.0
2	**SH223**	3 Term. Pos. VR	7.5 to 25	5.0	3.0	8.0
3	**SH323**	3 Term. Pos. VR	7.5 to 25	5.0	3.0	8.0
4	**μA78H05**	3 Term. Pos. VR	7.5 to 25	5.0	5.0	8.0
5	**μA78H05A**	3 Term. Pos. VR	7.0 to 40	5.0	5.0	8.0
6	**μA78P05**	3 Term. Pos. VR	7.0 to 40	5.0	10	12
7	**μA78H12**	3 Term. Pos. VR	15.5 to 25	12	5.0	8.0
8	**μA78H15**	3 Term. Pos. VR	18.5 to 25	15	5.0	8.0
9	**SH1605***	Switching Regulator	5.0 to 40	2.0 to 20	5.0	10
10	**μA78HG**	4 Term. Pos. VR	7.5 to 40	5.0 to 24	5.0	8.0
11	**μA79HG**	4 Term. Neg. VR	7.0 to -40	-2.2 to -24	5.0	8.0

AMPLIFIERS

OPERATIONAL AMPLIFIER

Item	DEVICE NO.	Description	Input Offset Voltage mV	Input Offset Voltage Drift μV/°C	Input Offset Current nA
12	**SH2714**	Dual Instrumentation Amplifier	0.5	0.7	2.8

SERVO AMPLIFIER

Item	DEVICE NO.	Description	Input Offset Voltage mV	Input Offset Voltage Drift μV/°C	Input Offset Current-nA
13	**SH3015***	Servo Amplifier	6.0	—	200

CURRENT AMPLIFIER

Item	DEVICE NO.	Function	Voltage Gain (Typ)	AC Current Gain-A/mA	Input Impedance K Ω (Typ)
14	**SH0002**	Current Amplifier	0.97	40	400

*To be announced

Line Regulation %	Quiescient Current mA	Ripple Rejection dB	Dropout Voltage V	Logic/ Connection Diagram	Package(s)
1	10	60	2.5	H12	TO-3
1	10	60	2.5	H12	TO-3
1	10	60	2.5	H12	TO-3
1	10	60	2.5	H12	TO-3
1	10	60	1.75	H12	TO-3
1	10	60	2.0	H12	TO-3
1	10	60	3.5	H9	TO-3
1	10	60	3.5	H9	TO-3
—	30	—	—	—	—
1	10	60	2.5	H10	4-pin TO-3
1	5	50	3.5	H11	4-pin TO-3

Input Bias Current nA	Common Mode Range V	Diff. Input Voltage V	Voltage Gain V/V	Bandwidth A_V = MHz	Output Current A	Logic/ Connection Diagram	Package(s)
3.0	±30	0.3	20K	1.0	—	H2	TO-116

Input Bias Current nA	Common Mode Range V	Diff. Input Voltage V	Voltage Gain V/V	Bandwidth A_V = MHz	Output Current A	Logic/ Connection Diagram	Package(s)
500	±12	—	—	—	6.0	—	—

Output Impedance Ω (Typ)	Output Voltage Swing (Typ)	DC Offset Voltage mV (Typ)	Bandwidth MHz (Typ)	Logic/ Connection Diagram	Package(s)
6.0	±11	30	50	H1	TO-99

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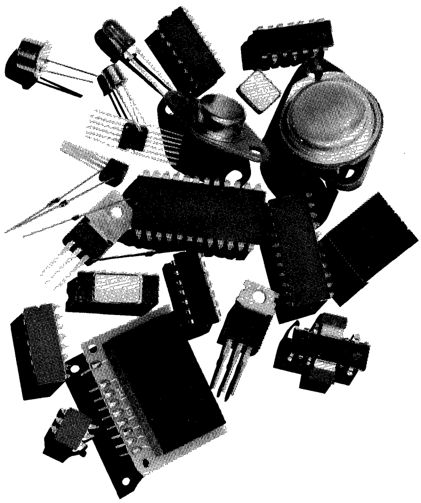
AUTOMOTIVE

IGNITION MODULES

Item	DEVICE NO.	Description	Input Capability	Output Current A	Package(s)
1	**SH4240**	Ignition Module	Magnetic Pickup	2.0 to 7.0	Module A,B
2	**SH4241**	Ignition Module	Magnetic Pickup	2.0 to 7.0	Module A,B
3	**SH4242**	Ignition Module	Logic	2.0 to 7.0	Module A,B
4	**SH4243**	Ignition Module	Logic	2.0 to 7.0	Module A,B
5	**SH4244**	Ignition Module	Opto, Logic, Hall Effect	2.0 to 7.0	Module C
6	**SH4245**	Ignition Module	Opto, Logic, Hall Effect	2.0 to 7.0	Module C



VOLTAGE REGULATORS

VOLTAGE REGULATORS (BY OUTPUT CURRENT)

Item	DEVICE NO.	Output Voltage V (Typ)	Temperature *	Line Regulation mV (Max)	Load Regulation mV (Max)	Ripple Rejection dB (Min)	Quiescent Current mA	Input Voltage Range V	Dropout Voltage V (Typ)	Logic/Connection Diagram(s)	Package(s)
Fixed Positive 100 mA											
1	**μA78L26**	2.6	C, V	100	50	43	5.5	4.8 to 35	2.2	L-VR1,2	TO-39,TO-92
2	**μA78L05**	5.0	C, V	150	60	41	5.5	7.2 to 35	2.2	L-VR1,2	TO-39,TO-92
3	**μA78L62**	6.2	C, V	175	80	40	5.5	8.4 to 35	2.2	L-VR1,2	TO-39,TO-92
4	**μA78L82**	8.2	C, V	175	80	39	5.5	10.4 to 35	2.2	L-VR1,2	TO-39,TO-92
5	**μA78L09**	9.0	C, V	188	90	38	5.5	11.2 to 35	2.2	L-VR1,2	TO-39,TO-92
6	**μA78L12**	12	C, V	250	100	37	6.0	14.2 to 35	2.2	L-VR1,2	TO-39,TO-92
7	**μA78L15**	15	C, V	300	150	34	6.0	17.2 to 35	2.2	L-VR1,2	TO-39,TO-92
8	**μA78L18**	18	C, V	300	170	33	6.0	20.2 to 40	2.2	L-VR1,2	TO-39,TO-92
9	**μA78L24**	24	C, V	300	200	31	6.0	26.2 to 40	2.2	L-VR1,2	TO-39,TO-92
Fixed Positive 500 mA											
10	**μA78M05**	5.0	M	50	50	62	6.0	8.0 to 35	2.5	L-VR2	TO-39
11	**μA78M05**	5.0	C	100	100	62	6.0	7.5 to 35	2.5	L-VR2,6	TO-39,TO-220
12	**μA78C05**	5.0	M	100	50	62	6.0	8.0 to 35	3.0	L-VR6	TO-220
13	**μA78M06**	6.0	M	60	60	59	6.0	9.0 to 35	2.5	L-VR2	TO-39
14	**μA78M06**	6.0	C	100	120	59	6.0	8.5 to 35	2.5	L-VR2,6	TO-39,TO-220
15	**μA78C06**	6.0	C, V	100	60	59	6.0	9.0 to 35	3.0	L-VR6	TO-220
16	**μA78M08**	8.0	M	60	80	56	6.0	11 to 35	2.5	L-VR2	TO-39
17	**μA78M08**	8.0	C	100	160	56	6.0	10.5 to 35	2.5	L-VR2,6	TO-39,TO-220
18	**μA78C08**	8.0	C, V	100	80	46	6.0	11 to 35	3.0	L-VR6	TO-220
19	**μA78C10**	10	C	100	100	55	6.0	13 to 35	3.0	L-VR6	TO-220
20	**μA78M12**	12	M	60	120	55	6.0	15 to 35	2.5	L-VR2	TO-39
21	**μA78M12**	12	C, V	100	240	55	6.0	14.5 to 35	2.5	L-VR2,6	TO-39,TO-220
22	**μA78C12**	12	C	100	120	46	6.0	15 to 35	3.0	L-VR6	TO-220
23	**μA78M15**	15	M	60	150	54	6.0	18 to 35	2.5	L-VR2	TO-39
24	**μA78M15**	15	C	100	300	54	6.0	17.5 to 35	2.5	L-VR2,6	TO-39,TO-220

*Operating junction temperature range:
C = Commercial temperature range, 0°C to +125°C; V = Vehicular & Industrial temperature range, -40°C to +125°C; M = Extended Military, -55°C to +150°C.

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VOLTAGE REGULATORS

VOLTAGE REGULATORS (BY OUTPUT CURRENT) (Cont'd)

Item	DEVICE NO.	Output Voltage V (Typ)	Temperature *	Line Regulation mV (Max)	Load Regulation mV (Max)	Ripple Rejection dB (Min)	Quiescent Current mA	Input Voltage Range V	Dropout Voltage V (Typ)	Logic/Connection Diagram(s)	Package(s)
Fixed Positive 500 mA (Cont'd)											
1	**μA78C15**	15	C	100	150	46	6.0	18 to 35	3.0	L-VR6	TO-220
2	**μA78C17**	17	C	100	170	52	6.0	20 to 35	3.0	L-VR6	TO-220
3	**μA78C18**	18	C	100	180	46	6.0	21 to 35	3.0	L-VR6	TO-220
4	**μA78M20**	20	M	60	200	53	6.0	23 to 40	2.5	L-VR2	TO-39
5	**μA78M20**	20	C	100	400	53	6.0	22.5 to 40	2.5	L-VR2,6	TO-39,TO-220
6	**μA78C20**	20	C	100	200	46	6.0	23 to 40	3.0	L-VR6	TO-220
7	**μA78C22**	22	C	100	220	53	6.0	24.5 to 40	2.5	L-VR6	TO-220
8	**μA78M24**	24	M	60	240	50	6.0	27 to 40	2.5	L-VR2	TO-39
9	**μA78M24**	24	C	100	480	50	6.0	26.5 to 40	2.5	L-VR2,6	TO-39,TO-220
10	**μA78C24**	24	C	100	240	46	6.0	27 to 40	3.0	L-VR6	TO-220
Fixed Negative 500 mA											
11	**μA79M05**	-5.0	M	50	100	54	2.0	-7.5 to -35	2.5	L-VR3	TO-39
12	**μA79M05**	-5.0	C	50	100	54	2.0	-7.3 to -35	2.3	L-VR3,7	TO-39
13	**μA79M06**	-6.0	M	60	120	54	2.0	-8.5 to -35	2.5	L-VR3	TO-39,TO-220
14	**μA79M06**	-6.0	C	60	120	54	2.0	-8.3 to -35	2.3	L-VR3,7	TO-220
15	**μA79M08**	-8.0	M	80	160	54	2.0	-10.5 to -35	2.5	L-VR3	TO-39
16	**μA79M08**	-8.0	C	80	160	54	2.0	-10.3 to -35	2.3	L-VR3,7	TO-39,TO-220
17	**μA79M12**	-12	M	80	240	54	3.0	-14.5 to -35	2.5	L-VR3	TO-39
18	**μA79M12**	-12	C	80	240	54	3.0	-14.3 to -35	2.3	L-VR3,7	TO-39,TO-220
19	**μA79M15**	-15	M	80	240	54	3.0	-17.5 to -35	2.5	L-VR3	TO-39
20	**μA79M15**	-15	C	80	240	54	3.0	-17.3 to -35	2.3	L-VR3,7	TO-39,TO-220
21	**μA79M20**	-20	M	80	300	54	3.5	-22.5 to -40	2.5	L-VR3	TO-39
22	**μA79M20**	-20	C	80	300	54	3.5	-22.3 to -40	2.3	L-VR3,7	TO-39,TO-220
23	**μA79M24**	-24	M	80	300	54	3.5	-26.5 to -40	2.5	L-VR3	TO-39
24	**μA79M24**	-24	C	80	300	54	3.5	-26.3 to -40	2.3	L-VR3,7	TO-39,TO-220

* Operating junction temperature range:
C = Commercial temperature range, 0°C to +125°C; V = Vehicular & Industrial temperature range, -40°C to +125°C; M = Extended Military, -55°C to +150°C.

VOLTAGE REGULATORS

VOLTAGE REGULATORS (BY OUTPUT CURRENT) (Cont'd)

Item	DEVICE NO.	Output Voltage V (Typ)	Temperature *	Line Regulation mV (Max)	Load Regulation mV (Max)	Ripple Rejection dB (Min)	Quiescent Current mA	Input Voltage Range V	Dropout Voltage V (Typ)	Logic/Connection Diagram(s)	Package(s)
Fixed Positive 1.0 A											
1	**μA7805**	5.0	M	50	50	68	6.0	8.0 to 35	3.0	L-VR10	TO-3
2	**μA7805**	5.0	C	100	100	62	8.0	7.5 to 35	2.5	L-VR6,10	TO-3,TO-220
3	**μA309**	5.0	C	50	100	—	10	—	—	L-VR10	TO-3
4	**μA109**	5.0	M	50	100	—	10	—	—	L-VR10	TO-3
5	**μA209**	5.0	V	50	100	—	10	—	—	L-VR10	TO-3
6	**μA7806**	6.0	M	60	60	65	6.0	9.0 to 35	3.0	L-VR10	TO-3
7	**μA7806**	6.0	C	120	120	59	8.0	8.5 to 35	2.5	L-VR6,10	TO-3,TO-220
8	**μA7808**	8.0	M	80	80	62	6.0	11 to 35	3.0	L-VR6,10	TO-3,TO-220
9	**μA7808**	8.0	C	160	160	56	8.0	10.5 to 35	2.5	L-VR6,10	TO-3,TO-220
10	**μA7885**	8.5	M	85	85	60	6.0	11.5 to 35	3.0	L-VR10	TO-3
11	**μA7885**	8.5	C	170	170	54	8.0	11 to 35	2.5	L-VR6,10	TO-3,TO-220
12	**μA7812**	12	M	120	120	61	6.0	15 to 35	3.0	L-VR10	TO-3
13	**μA7812**	12	C	240	240	55	8.0	14.5 to 35	2.5	L-VR6,10	TO-3,TO-220
14	**μA7815**	15	M	150	150	60	6.0	18 to 35	3.0	L-VR10	TO-3
15	**μA7815**	15	C	300	300	54	8.0	17.5 to 35	2.5	L-VR6,10	TO-3,TO-220
16	**μA7818**	18	M	180	180	59	6.0	21 to 35	3.0	L-VR10	TO-3
17	**μA7818**	18	C	360	360	53	8.0	20.5 to 35	2.5	L-VR6,10	TO-3,TO-220
18	**μA7824**	24	M	240	240	56	6.0	27 to 40	3.0	L-VR10	TO-3
19	**μA7824**	24	C	480	480	50	8.0	26.5 to 40	2.5	L-VR6,10	TO-3,TO-220
Fixed Negative 1.0 A											
20	**μA7905**	-5.0	M	50	50	54	2.0	-7.8 to -35	2.8	L-VR11	TO-3
21	**μA7905**	-5.0	C	100	100	54	2.0	-7.3 to -35	2.3	L-VR7,11	TO-3,TO-220
22	**μA7906**	-6.0	M	60	60	54	2.0	-8.8 to -35	2.8	L-VR11	TO-3
23	**μA7906**	-6.0	C	120	120	54	2.0	-8.3 to -35	2.3	L-VR7,11	TO-3,TO-220
24	**μA7908**	-8.0	M	80	80	54	2.0	-10.8 to -35	2.8	L-VR11	TO-3

*Operational junction temperature range:
C = Commercial temperature range, 0°C to +125°C; V = Vehicular & Industrial temperature range, -40°C to +125°C; M = Extended Military, -55°C to +150°C.

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VOLTAGE REGULATORS

VOLTAGE REGULATORS (BY OUTPUT CURRENT) (Cont'd)

Item	DEVICE NO.	Output Voltage V (Typ)	Temperature (1)	Line Regulation mV (Max)	Load Regulation mV (Max)	Ripple Rejection dB (Min)	Quiescent Current mA	Input Voltage Range V	Dropout Voltage V (Typ)	Logic/Connection Diagram(s)	Package(s)
Fixed Negative 1.0 A (Cont'd)											
1	**μA7908**	-8.0	C	160	160	54	2.0	-10.3 to -35	2.3	L-VR7,11	TO-3,TO-220
2	**μA7912**	-12	M	120	120	54	3.0	-14.8 to -35	2.8	L-VR11	TO-3
3	**μA7912**	-12	C	240	240	54	3.0	-14.3 to -35	2.3	L-VR7,11	TO-3,TO-220
4	**μA7915**	-15	M	150	150	54	3.0	-17.8 to -35	2.8	L-VR11	TO-3
5	**μA7915**	-15	C	300	300	54	3.0	-17.3 to -35	2.3	L-VR7,11	TO-3,TO-220
6	**μA7918**	-18	M	180	180	54	3.0	-20.8 to -35	2.8	L-VR11	TO-3
7	**μA7918**	-18	C	360	360	54	3.0	-20.3 to -35	2.3	L-VR7,11	TO-3,TO-220
8	**μA7924**	-24	M	240	240	54	3.0	-26.8 to -40	2.8	L-VR11	TO-3
9	**μA7924**	-24	C	480	480	54	3.0	-26.3 to -40	2.3	L-VR7,11	TO-3,TO-220
Fixed Positive 2.0 A											
10	**μA78CB**	13.8	C	150	150	50	8.0	17 to 25	2.5	L-VR6,10	TO-3,TO-220
Fixed Positive 3.0 A											
11	**SH123**	5.0	M	25	100	—	20	7.5 to 20	2.5	H12	TO-3
12	**SH223**	5.0	M	25	100	—	20	7.5 to 20	2.5	H12	TO-3
13	**SH323**	5.0	C	25	100	—	20	7.5 to 20	2.5	H12	TO-3
Fixed Positive 5.0 A											
14	**μA78H05**	5.0	C, M	120	50	60	10	8.5 to 25	3.5	H12	TO-3
15	**μA78H05A** (2)	5.0	C, M	25	50	60	10	7.8 to 2.5	2.3	H12	TO-3
16	**μA78H12**	12	C	—	120	60	10	15.5 to 25	3.5	H9	TO-3
17	**μA78H15**	15	C	30	30	60	10	18.5 to 25	—	H9	TO-3
Fixed Positive 10 A											
18	**μA78P05** (2)	5.0	C	25	50	60	10	7.5 to 40	2.5	H12	TO-3

1. Operating junction temperature range:
   C = Commercial temperature range, 0°C to +125°C; V = Vehicular & Industrial temperature range, -40°C to +125°C; M = Extended Military, -55°C to +150°C.
2. To be announced

VOLTAGE REGULATORS

VOLTAGE REGULATORS (BY OUTPUT CURRENT) (Cont'd)

Item	DEVICE NO.	Output Current (mA)	Output Voltage Range V	Temperature (1)	Line Regulation %V_{OUT}	Load Regulation %V_{OUT}	Ripple Rejection dB	Quiescent Current mA	Input Voltage Range V	Dropout Voltage V	Logic/Connection Diagram(s)	Package(s)
Positive Adjustable												
1	**μA105**	12	4.5 to 30	M	0.06	0.1	1.0	2.0	8.5 to 50	3.0	L-VR14	TO-99
2	**μA305**	12	4.5 to 30	C	0.06	0.1	1.0	2.0	8.5 to 40	3.0	L-VR14	TO-99
3	**μA376**	25	5.0 to 37	C	0.1	0.5	1.0	2.5	9.0 to 40	3.0	L-VR20	9T
4	**μA305A**	45	4.5 to 40	C	0.06	0.4	—	2.0	8.5 to 50	3.0	L-VR14	TO-99
5	**μA723**	150	2.0 to 37	M	0.3	0.15	58	3.5	9.5 to 40	3.0	L-VR15,17	TO-100,6A
6	**μA723**	150	2.0 to 37	C	0.5	0.2	58	4.0	9.5 to 40	3.0	L-VR15,17	TO-100,6A,9A
7	**μA78MG**	500	5.0 to 30	M	1.0	1.0	62	5.0	7.5 to 40	3.0	L-VR4	TO-39
8	**μA78MG**	500	5.0 to 30	C	1.0	1.0	62	5.0	7.5 to 40	2.5	L-VR4,8,18	TO-39,8Z,9V
9	**μA78G**	1000	5.0 to 30	M	1.0	1.0	68	5.0	7.5 to 40	2.5	L-VR12	TO-3
10	**μA78G**	1000	5.0 to 30	C	1.0	1.0	62	5.0	7.5 to 40	3.0	L-VR8,12	TO-3,8Z
11	**μA78HG**	5000	5.0 to 24	C	1.0	1.0	60	10	8.5 to 25	3.5	H10	TO-3
Negative Adjustable												
12	**μA104**	25	-0.015 to -40	M	0.1	5mV	1.0	5.0	-8.0 to -50	2.0	L-VR16	TO-100
13	**μA304**	25	-0.035 to -30	C	0.1	5mV	1.0	5.0	-8.0 to -40	2.0	L-VR16	TO-100
14	**μA79MG**	500	-2.23 to -30	M	1.0	1.0	50	2.5	-7.0 to -30	2.5	L-VR5	TO-39
15	**μA79MG**	500	-2.23 to -30	C	1.0	1.0	50	2.5	-7.0 to -30	2.3	L-VR5,9,19	TO-39,8Z,9V
16	**μA79G**	1000	-2.23 to -30	M	1.0	2.0	50	2.0	-7.0 to -40	2.8	L-VR13	TO-3
17	**μA79G**	1000	-2.23 to -30	C	1.0	2.0	50	2.0	-7.0 to -40	2.3	L-VR9,13	TO-3,8Z
18	**μA79HG**	5000	-2.25 to -24	C,M	1.0	1.0	50	5.0	-7.0 to -40	2.0	H11	TO-3
Adjustable Switching Regulator												
19	**μA78S**	1500	-1.3 to -40	M	—	—	100	2.0	-2.5 to -40	—	L-VR21	6B
20	**μA78S**	1500	-1.3 to -40	C	—	—	100	2.0	-2.5 to - 40	—	L-VR21	6B,9B
21	**SH1605**(2)	5000	2.0 to 20	C	—	—	—	30	5.0 to 40	—	—	—

1. Operating junction temperature range:
   C = Commercial temperature range, 0°C to +125°C; V = Vehicular & Industrial temperature range, -40°C to +125°C; M = Extended Military, -55°C to +150°C.
2. To be announced

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OPERATIONAL AMPLIFIERS

OPERATIONAL AMPLIFIERS—COMMERCIAL (0°C TO +70°C)

Item	DEVICE NO.*	Description	Input Offset Voltage mV (Max)	Input Offset Voltage Drift μV/°C (Max)	Input Offset Current nA (Max)	Input Bias Current nA (Max)	Common Mode Range V
1	**μA301A**	General Purpose Op Amp	7.5	30	50	250	±12
2	**μA302**	Voltage Follower	15	30	—	30	±10
3	**μA307**	General Purpose Op Amp	7.5	30	50	250	±15
4	**μA308**	Super Beta Op Amp	7.5	30	1.0	7.0	±13.5
5	**μA308A**	Super Beta Op Amp	0.5	5.0	1.0	7.0	±13.5
6	**μA310**	Voltage Follower	7.5	—	—	7.0	±10
7	**μA318**	High Speed Op Amp	10	—	200	500	±11.5
8	**μA324**	Quad Op Amp	7.0	—	50	250	+13,$-V_S$
9	**μA348**	Quad Op Amp	6.0	—	50	200	±12
10	**μAF355**	FET Input Op Amp	10	—	0.05	0.2	±10
11	**μAF356**	FET Input Op Amp	10	—	0.05	0.2	±10
12	**μA702C**	WideBand dc Amp	5.0	10	2000	7500	-4,+0.5
13	**μA709C**	High Perf Op Amp	7.5	—	500	1500	±8
14	**μA714C**	High Perf Op Amp	0.15	1.8	6.0	7.0	±13
15	**μA714E**	High Perf Op Amp	0.075	1.3	3.8	4.0	±13
16	**μA714L**	High Perf Op Amp	0.25	3.0	20	30	±13
17	**μA715C**	High Speed Op Amp	7.5	—	250	1500	±10
18	**μA725C**	Instr Op Amp	2.5	—	35	125	±13.5
19	**μA725E**	Instr Op Amp	0.5	2.0	5.0	75	±13.5
20	**μA727C**	Temp Controlled Diff Amp	10	1.5	25	75	±12
21	**μA730C**	Differential Amp	5.0	—	3.0	16	±3.5
22	**μA740E**	FET Input Op Amp	100	—	0.3	2.0	±10
23	**μA741C**	Freq Comp Op Amp	6.0	—	200	500	±12
24	**μA741E**	Freq Comp Op Amp	3.0	15	30	80	±12
25	**μA747C**	Dual Freq Comp Op Amp	6.0	—	200	500	±12
26	**μA747E**	Dual Freq Comp Op Amp	3.0	—	200	500	±12
27	**μA748C**	High Perf Op Amp	6.0	—	200	500	±12
28	**μA776C**	Multi-Purpose Prog Op Amp (I_{SET} = 15 μA)	6.0	—	25	50	±10

*Military, automotive and industrial range devices are available. Please request specific data.

Differential Input Voltage V	Voltage Gain V/V	Bandwidth Av = 1 MHz	Output Current mA (Max)	Slew Rate Av = 1 V/μs	Supply Voltage Min V (Typ)	Supply Voltage Max V (Typ)	Supply Current mA (max)	Compensation Components	Logic/Connection Diagram	Package(s)
±30	25K	1.0	5.0	0.5	±3	±18	3.0	1	L-OA9,22	TO-99,6A,9T
—	0.9985	10	1.0	10	±12	±18	5.5	0	L-OA1	TO-99
±30	25K	1.0	5.0	0.5	±3	±18	3.0	0	L-OA2	TO-99,9T
±0.5	15K	1.0	1.0	0.3	±5	±18	0.8	1	L-OA3,27	TO-99,9T
±0.5	80K	1.0	1.0	0.3	±2	±20	0.8	1	L-OA3,27	TO-99,9T
—	0.999	20	1.0	30	±5	±18	5.5	0	L-OA1	TO-99
±10	25K	15	6.0	50	±5	±18	10	0	L-OA8	TO-99
±32	25K	1.0	1.2	0.5	+5	+32	2.0	0	L-OA25	6A,9A
±36	25K	1.0	5.0	0.5	±5	±18	4.5	0	L-OA25	6A,9A
±30	50K	2.5	—	5.0	±5	±18	4.0	0	L-OA8	TO-99,9T
±30	50K	5.0	—	12	±5	±18	10	0	L-OA8	TO-99,9T
±5	2K	30	3.5	3.5	+6,-3	+14,-7	6.7	2	L-OA4,17	TO-99,6A
±5	15K	1.0	5.0	0.3	±9	±18	2.9	0	L-OA5,18	TO-99,6A,9A,9T
±30	—	1.2	5.5	0.25	±3	±22	5.0	0	L-OA1	TO-99
±30	—	1.2	6.0	0.25	±3	±22	4.0	0	L-OA1	TO-99
±30	—	1.2	5.0	0.25	±3	±18	6.0	0	L-OA1	TO-99
±15	10K	65	5.0	100	±6	±18	10	3	L-OA12,19	TO-100,6A
±22	250K	1.0	5.0	—	±3	±22	3.0	4	L-OA6	TO-99
±22	1000K	1.0	5.0	—	±3	±22	3.0	4	L-OA6	TO-99
±15	0.06K	1.0	0.001	—	±9	±18	5.7	2	L-OA13	TO-100
±5	0.1K	1.5	—	—	+6	+14	13	0	L-OA7	TO-99
±30	25K	3.0	5.0	6.0	±5	±22	8.0	0	L-OA8	TO-99
±30	20K	1.0	5.0	0.5	±5	±18	2.8	0	L-OA8,20	TO-99,6A,9A,9T
±30	50K	1.0	5.0	0.7	±5	±22	3.75	0	L-OA8,20	TO-99,6A,9T
±30	20K	1.0	5.0	0.5	±5	±18	5.6	0	L-OA14,21	TO-100,6A,9A
±30	20K	1.0	5.0	0.5	±5	±18	4.25	0	L-OA14,21	TO-100,6A
±30	20K	1.0	5.0	0.5	±5	±18	2.8	1	L-OA9,22	TO-99,6A,6T,9T
±30	50K	1.0	2.0	0.8	±1.2	±18	0.19	1	L-OA10,23	TO-99,6A,9T

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OPERATIONAL AMPLIFIERS

OPERATIONAL AMPLIFIERS—COMMERCIAL (0°C TO +70°C) (Cont'd)

Item	DEVICE NO.	Description	Input Offset Voltage mV (Max)	Input Offset Voltage Drift μV/°C (Max)	Input Offset Current nA (Max)	Input Bias Current nA (Max)	Common Mode Range V
1	**μA776C**	Multi-Purpose Prog Op Amp (I_{SET} = 1.5 μA)	6.0	—	6.0	10	±10
2	**μA777C**	Precision Op Amp	7.5	—	50	250	±12
3	**μA791C**	Power Operational Amp	6.0	—	200	500	±12
4	**μA798C**	Dual Op Amp	6.0	—	50	250	+36,-V_S
5	**μA1458C**	Internally Comp, High Perf Dual Mono Op Amp	6.0	—	200	500	±12
6	**μA3401**	Quad Single Supply Amp	—	—	—	300	—
7	**μA3403**	Quad Op Amp	8.0	—	50	-500	+13,-V_S
8	**μA4136**	Quad Op Amp	6.0	—	200	500	±12
9	**μA4558**	Dual Op Amp	6.0	—	200	500	±12
10	**SH0002**(2)	Current Amp	30	—	—	10K	—
11	**SH2714**(2)	Dual Instrumentation Amp	0.25	3.0	20	30	±18
12	**SH3006**(2,3)	I. 0 GHz Preamp	—	—	—	—	—
13	**SH3015**(2,3)	Servo Amp	6.0	—	200	500	±12

1. Military, automotive and industrial range devices are available. Please request specific data.
2. Also see Hybrid Section
3. To be announced

VOLTAGE COMPARATORS

Item	DEVICE NO.	Description	Input Bias Current(1) μA (Max)	Input Offset Current(1) μA (Max)	Input Offset Voltage(1)	Voltage Gain (Typ)
14	**μAF111**	Voltage Comparator (FET Front End Inputs)	0.05	0.000025	4.0	200K
15	**μAF211**	Voltage Comparator (FET Front End Inputs)	0.05	0.000025	4.0	200K
16	**μAF311**	Voltage Comparator (FET Front End Inputs)	0.15	0.000075	10	200K

Notes on following pages.

	Differential Input Voltage V	Voltage Gain V/V	Bandwidth Av = 1 MHz	Output Current mA (Max)	Slew Rate Av = 1 V/μs	Supply Voltage Min V (Typ)	Supply Voltage Max V (Typ)	Supply Current mA (max)	Compensation Components	Logic/Connection Diagram	Package(s)
	±30	50K	0.2	0.12	0.1	±1.2	±18	0.03	1	L-OA10,23	TO-99,6A,9T
	±30	25K	1.0	5.0	0.5	±5	±20	2.8	1	L-OA9,22	TO-99,6A,9T
	±30	20K	1.0	1080	0.5	±5	±18	25	4	L-OA15,16	TO-100,9W
	±30	20K	1.0	6.0	0.5	+5	+36	4.0	0	L-OA11	TO-99,6T,9T
	±30	20K	1.0	5.0	0.5	±5	±18	2.9	0	L-OA11	TO-99,9T
	—	1K	5.0	10	0.6	+5	±9	10	0	L-OA24	9A
	±30	25K	1.0	5.0	0.6	+5	+18	7.0	0	L-OA25	6A,9A
	±36	20K	3.0	5.0	1.2	±5	±18	10	0	L-OA26	6A,9A
	±36	20K	3.0	5.0	1.2	±5	±18	5.0	0	L-OA11	TO-99,9T
	—	0.97	50	100	200	±5	±20	±10	0	H1	TO-99
	30	150	1.2	5.0	0.25	±3	±10	12	0	H2	6A
	—	200	>1K	—	—	+12	+18	—	0	—	—
	—	—	—	10K	1.0	±12	±40	30	0	—	—

	Supply Voltage V (Typ)	Response Time[2] ns (Typ)	DTL/TTL Fanout	Temperature Range[3]	Logic/Connection Diagram	Package(s)
	+36	200	2	M	L-OA28,29	TO-99
	+36	200	2	A	L-OA28,29	TO-99
	+36	200	2	C	L-OA28,29	TO-99

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OPERATIONAL AMPLIFIERS

VOLTAGE COMPARATORS (Cont'd)

Item	DEVICE NO.	Description	Input Bias Current(1) μA (Max)	Input Offset Current(1) μA (Max)	Input Offset Voltage(1)	Voltage Gain (Typ)
1	**μA111**	Voltage Comparator (Strobed Inputs, Single Supply, Low I_B)	0.1	0.04	0.7	200K
2	**μA211**	Voltage Comparator (Strobed Inputs, Single Supply, Low I_B)	0.1	0.04	0.7	200K
3	**μA311**	Voltage Comparator (Strobed Inputs, Single Supply, Low I_B)	0.25	0.06	2.0	200K
4	**μA139**	Quad Comparator (Single Supply, MRR incl. gnd)	0.1	0.025	5.0	200K
5	**μA139A**	Quad Comparator (Single Supply, MRR incl. gnd)	0.1	0.025	2.0	200K
6	**μA239**	Quad Comparator (Single Supply, MRR incl. gnd)	0.25	0.05	5.0	200K
7	**μA239A**	Quad Comparator (Single Supply, MRR incl. gnd)	0.25	0.05	2.0	200K
8	**μA339**	Quad Comparator (Single Supply, MRR incl. gnd)	0.25	0.05	5.0	200K
9	**μA339A**	Quad Comparator (Single Supply, MRR incl. gnd)	0.25	0.05	2.0	200K
10	**μA710**	Voltage Comparator	20/25	3.0/5.0	2.0/5.0	1.75K
11	**μA711**	Dual Comparator	75/100	10/15	3.5/5.0	1.5K
12	**μA734**	Precision Comparator (Low Drift -3.5μV/°C)	0.15	0.025/0.05	5.0/3.0	25K
13	**μA760**	High Speed Differential Comparator	60	7.5	6.0	5K
14	**μA775**	Quad Comparator (Single Supply, MRR incl. gnd)	0.3	0.07	9.0	200K
15	**μA2901**	Quad Comparator (Single Supply, MRR incl. gnd)	0.25	0.05	7.0	200K
16	**μA7302**	Quad Comparator (Single Supply, MRR incl. gnd)	0.1	0.03	5.0	200K

1. Measured at $T_A = 25°C$
2. Response time is specified for 100 mV step input with 5.0 mV overdrive.
3. M = Military temperature range, -55°C to +125° C; A = Automotive temperature range, -40°C to +85°C; C = Commercial temperature range, 0°C to +70°C.

	Supply Voltage V (Typ)	Response Time(2) ns (Typ)	DTL/TTL Fanout	Temperature Range(3)	Logic/Connection Diagram	Package(s)
	0, +5 to ±15	200	5	M	L-OA28,29	TO-99, 6T
	0, +5 to ±15	200	5	A	L-OA28,29	TO-99, 6T
	0, +5 to ±15	200	5	C	L-OA28,29	TO-99,6T
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	M	L-OA30	6A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	M	L-OA30	6A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	A	L-OA30	6A,9A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	A	L-OA30	6A,9A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	C	L-OA30	6A,9A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	C	L-OA30	6A
	+12,-6	40	1	M,C	L-OA31,32,33	TO-99,3F,6A,9A
	+12,-6	40	1	M,C	L-OA34,35,36	TO-100,3F,6A,9A
	±5 to ±15	200	2	M,C	L-OA37,38	TO-100,6A
	±4.5 to ±6.5	25	2	M,C	L-OA39,40	TO-99,6A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	M,C	L-OA30	6A,9A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	A	L-OA30	9A
	±1 to ±18, gnd to +2 or gnd to +36	1300	1	C	L-OA30	6A,9A

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CONSUMER CIRCUITS

AUDIO POWER AMPLIFIERS

Item	DEVICE NO.	Features	Power Supply Voltage V	Speaker Impedance Ω	Power Output W	Logic/ Connection Diagram	Package(s)
1	**TBA641A12**	High current capability	9.0	4.0	2.2	L-C12	9H (Quil)
2	**TBA641B11**	High current capability	14	4.0	4.5	L-C12	9J (Quil)
3	**TBA800**	Suitable for 24 V supply operation; eg: TV	24	16	5.0	L-C11	9W-P3
4	**TBA800A**	Suitable for 24 V supply operation; eg: TV	24	16	5.0	L-C11	9W-P4
5	**TBA810S**	Thermal shutdown	14.4	4.0	6.0	L-C10	9W-P3
6	**TBA810AS**	Thermal shutdown	14.4	4.0	6.0	L-C10	9W-P4
7	**TBA810DS**	Thermal shutdown over voltage protection	14.4	4.0	6.0	L-C10	9W-P3
8	**TBA810DAS**	Thermal shutdown over voltage protection	14.4	4.0	6.0	L-C10	9W-P4
9	**TBA820**	Low power supply operation-suitable for battery operation	12 9.0 6.0 3.5	8.0 8.0 4.0 4.0	2.0 1.2 0.75 0.22	L-C29	9A (Quil)
10	**TBA820L**	Low power supply operation-suitable for battery operation	12 9.0 6.0 3.5	8.0 8.0 4.0 4.0	2.0 1.2 0.75 0.22	L-C29	9A
11	**TDA2002**	Thermal shutdown, over voltage protection, short circuit protection	16 14.4 14.4	2.0 2.0 4.0	10 8.0 5.0	L-C1	GO (TO-220 type)
12	**TDA2002A**	Thermal shutdown, short circuit protection	16 14.4 14.4	2.0 2.0 4.0	10 8.0 5.0	L-C1	GO (TO-220 type)
13	**μA706A**	High current capability	9.0	4.0	2.2	L-C12	9H
14	**μA706B**	High current capability	14	4.0	5.5	L-C12	9J
15	**μA783**	Thermal shutdown (operation from 4.0 to 30 V)	24	8.0	9.0	L-C10	9W-P3,P4

TELEVISION CIRCUITS

Item	DEVICE NO.	Description	Useful for		Logic/Connection Diagram(s)	Package(s)
			NTSC	PAL		
16	**TAA630S**	Chroma Demodulator		X	L-C33	9B
17	**TBA510**	Chroma Processor		X	L-C44	9B
18	**TBA520**	Chroma Demodulator		X	L-C45	9B

CONSUMER CIRCUITS

TELEVISION CIRCUITS (Cont'd)

Item	DEVICE NO.	Description	Useful for		Logic/Connection Diagram(s)	Package(s)
			NTSC	PAL		
1	**TBA530**	RGB Matrix Preamplifier	X	X	L-C43	9B
2	**TBA540**	Reference Combination		X	L-C31	9B
3	**TBA560C**	Luma & Chroma Control Combination		X	L-C32	9B
4	**TBA920**	Horizontal Oscillator	X	X	L-C34	9B
5	**TBA920S**	Horizontal Oscillator	X	X	L-C34	9B
6	**TBA970**	Video Amplifier	X	X	L-C35	9B
7	**TBA990**	Chroma Demodulator		X	L-C36	9B
8	**TDA1190**	TV Sound System	X	X	L-C8	9W
9	**TDA1190Z**	TV Sound System	X	X	L-C8	9W
10	**TDA2510**	Chroma Combination	X	X	L-C47	9B
11	**TDA2521**	Chroma Demodulator		X	L-C46	9B
12	**μA746**	Chroma Demodulator	X		L-C17	TO-100, 9A
13	**μA780**	PLL Chroma Subcarrier Regenerator	X		L-C39	9B
14	**μA781**	Gain Controlled Chroma Amplifier	X		L-C21	9A
15	**μA787**	Chroma Processor	X		L-C40	9B
16	**μA788**	Chroma Demodulator— DC Tint Control	X		L-C41	9B
17	**μA796**	Double Balanced Modulator/ Demodulator	X	X	L-C4, 22	TO-100, 9A
18	**μA1391**	Horizontal Processor (+ Flyback)	X	X	L-C7	9T
19	**μA1394**	Horizontal Processor (– Flyback)	X	X	L-C7	9T
20	**μA3064**	Automatic Fine Tuning	X		L-C25	TO-100,9A
21	**μA3065**	Sound IF	X	X	L-C26	9A

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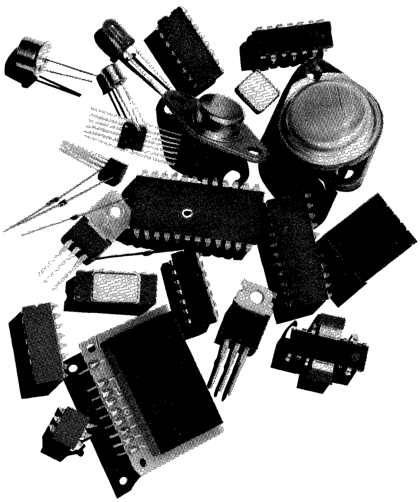
CONSUMER CIRCUITS

RADIO-AUDIO CIRCUITS

Item	DEVICE NO.	Description	Logic/Connection Diagram(s)	Package(s)
IF, RF Amplifiers, Gain Blocks, Detectors, Decoders				
1	**μA703**	IF, RF Amplifier	L-C2	TO-99
2	**μA720**	AM Radio Circuit (RF, Converter, IF)	L-C13	6A,9A
3	**μA721**	AM/FM IF Amplifier, FM Limiter, Detector	L-C37	9B
4	**μA732**	Stereo Decoder	L-C14	9A
5	**μA753**	FM Gain Block	L-C5	9T
6	**μA757**	Gain Controlled IF Amplifier	L-C19	6A
7	**μA758**	PLL Stereo Decoder	L-C38	9B
8	**μA767**	Stereo Decoder	L-C20	9A
9	**μA1310**	PLL Stereo Decoder	L-C23	9A
10	**μA2136**	FM IF Limiter Detector	L-C24	9A
11	**μA3075**	FM IF Limiter Detector	L-C27	9A
12	**μA3089**	FM IF Limiter Detector	L-C42	9B
Preamplifiers				
13	**μA739**	Dual Audio Preamplifier	L-C15	6A,9A
14	**μA749**	Dual Audio Preamplifier	L-C3, 18	TO-99,6A,9A
Dolby				
15	**μA7300**	Dolby "B" Noise Reduction	L-C48	9B
Special Functions				
16	**SH1549***	Station Memory Control Hybrid	H4	1" x 2" Single In-line
17	**SH1552***	Ladder Network for Signal Conversion	H3	1" x 2" Single In-line
18	**μA742**	Zero Crossing ac Trigger Trigac	L-C16	6A
19	**μA7390**	Ground Fault Detector	L-C6	9T
20	**μA7391**	2.0 A Motor Speed Control	L-C9	9W-P6
21	**μA7392**	300 mA Motor Speed Control	L-C30	6A, 9A

* For further information contact Hybrid Marketing



LINE DRIVERS/RECEIVERS/TRANSCEIVERS

LINE DRIVERS

Item	DEVICE NO.[1]	Function[2]	Companion Receiver	Input Compatibility	Type Output	Output Configuration	Output Current mA (Typ)	t_{pd}-ns (Typ)	Supply Voltage V	Power Dissipation mW (Typ)	Drivers per Package	Logic/Connection Diagram(s)	Package(s)
1	**μA1488**	Quad	μA1489	TTL	Volt	Single Ended	±10	220	±15	—	4	I49	6A,9A
2	**54/7437**	Quad 2-NAND	Any TTL	TTL	Volt	Single Ended	48	10	+5.0	108	4	D2	3I, 6A,9A
3	**54/7438**	Quad 2-NAND	96106	TTL	Volt	Single Ended	48	13	+5.0	98	4	D2	3I, 6A,9A
4	**54/7440**	Dual 2-NAND	Any TTL	TTL	Volt	Single Ended	48	11	+5.0	52	2	D5	3I, 6A,9A
5	**54H/74H40**	Dual 2-NAND	Any TTL	TTL	Volt	Single Ended	48	7.0	+5.0	88	2	D5	3I, 6A,9A
6	**54S/74S40**	Dual 2-NAND	Any TTL	TTL	Volt	Single Ended	48	4.0	+5.0	88	2	D5	3I, 6A,9A
7	**8T13**	Dual	8T14	TTL	Volt	Single Ended	250[3]	20	+5.0	280	2	I21	4L 6B,9B
8	**8T23**	Dual IBM-370	8T24	TTL	Volt	Single Ended	250[3]	20	+5.0	280	2	I21	6B,9B
9	**9009**	Dual 2-NAND	Any TTL	TTL	Volt	Single Ended	48	10	+5.0	54	2	D5	3I,6A
10	**9612**	Dual	9613	TTL	Volt	Diff	50	14	+5.0	150	2	I23	6T,9T
11	**9614**	Dual	9615	TTL	Volt	Diff or Single	40	16	+5.0	170	2	I2	4L 6B,9B
12	**9616**	Triple RS232	9617, 9627	TTL	Volt	Single Ended	17	300	±12	250	3	I4	3I 6A,9A
13	**9621**	Dual	9622	TTL	Volt	Diff or Single	20	10	+5.0, +15	100	2	I7	3I,6A
14	**9634**	Dual	9637A	TTL, CMOS	Volt	Diff	±50	10	+5.0	200	2	I33	4L 6B,9B
15	**9636**	Dual	9637A	TTL, CMOS	Volt	Single Ended	±75	—	±9.0 to ±15	200	2	I34	6T,9T
16	**9638**	Dual	9637A	TTL	Volt	Diff	±50	10	+5.0	—	2	I36	6T,9T
17	**10123/ 10523**[4]	Triple Bus Dvr	All 10K ECL	ECL	Volt	Single Ended	20	3.0	-5.2	312	3	E78	4L, 6B,9B

1. In some cases, only commercial temperature range devices are listed. Please request specific information for military versions.
2. OC = open collector, 3S = 3-state
3. Foldback current limited
4. 105XX and 106XX denote military temperature range

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LINE DRIVERS/RECEIVERS/TRANSCEIVERS

LINE DRIVERS (Cont'd)

Item	DEVICE NO.[1]	Function[2]	Companion Receiver	Input Compatibility	Type Output	Output Configuration	Output Current mA (Typ)	tpd-ns (Typ)	Supply Voltage V	Power Dissipation mW (Typ)	Drivers per Package	Logic/Connection Diagram(s)	Package(s)
1	**10192/ 10592[4]**	Quad	All ECL Logic	ECL	Volt	Single Ended	16	3.0	−5.2	510	4	E105	4L,6B
2	**54S/ 74S140**	Dual 2-NAND	Any TTL	TTL	Volt	Single Ended	40	4.0	+5.0	88	2	D5	3I, 6A,9A
3	**54LS/ 74LS240**	Octal Inverting Bus Dvr	Any TTL	TTL	Volt	Single Ended	40	12	+5.0	175	8	D73	9Z
4	**54LS/ 74LS241**	Octal Bus Dvr	Any TTL	TTL	Volt	Single Ended	40	12	+5.0	180	8	D74	9Z
5	**54LS/ 74LS244**	Octal Bus Dvr	Any TTL	TTL	Volt	Single Ended	40	12	+5.0	180	8	D77	9Z
6	**54LS/ 74LS540**	Octal 3S Inverting	Any TTL	TTL	Volt	Single Ended	40	12	+5.0	175	8	D80	9Z
7	**54LS/ 74LS541**	Octal 3S	Any TTL	TTL	Volt	Single Ended	40	12	+5.0	180	8	D81	9Z
8	**55/75109**	Dual	75107, 75108	TTL	Curr	Diff	6.0	9.0	±5.0	180	2	I14	3I 6A,9A
9	**55/75110**	Dual	75107, 75108	TTL	Curr	Diff	12	9.0	±5.0	285	2	I14	3I 6A,9A
10	**55/75121**	Dual	75122	TTL	Volt	Single Ended	250[3]	20	+5.0	280	2	I21	6B,9B
11	**75123**	Dual IBM-370	75124	TTL	Volt	Single Ended	250[3]	20	+5.0	280	2	I21	6B,9B
12	**75150**	Quad	75154	TTL DTL	Volt	Single Ended	15	20	±12	100	2	I51, 52	6A,6T, 9A,9T
13	**96101**	Quad 2-NAND OC	96106	TTL	Volt	Single Ended	80	13	+5.0	98	4	D3	TO-86 6A,9A
14	**100123**	Hex Bus Dvr	All 95K and 100K ECL	ECL	Volt	Single Ended	20	1.8	−4.5	730	6	E14	4Q
15	**100194**	Quint Duplex Bus Dvr	All 100K ECL	ECL	Volt	—	—	2.0	−4.5	—	—	E110	4Q,6Q

1. In some cases, only commercial temperature range devices are listed. Please request specific information for military versions.
2. OC = open collector, 3S = 3-state
3. Foldback current limited
4. 105XX and 106XX denote military temperature range

LINE DRIVERS/RECEIVERS/TRANSCEIVERS

LINE RECEIVERS

Item	DEVICE NO.(1)	Function	Companion Driver	Output Compatibility	Input Threshold Sensitivity V_{TH}-V	Common Mode V	Hysteresis Capability	tpd-ns (Typ)	Supply Voltage V	Power Dissipation mW (Typ)	Receivers per Package	Logic/Connection Diagram	Package(s)
1	**μA1489**	Quad RS232	μA1488	TTL	+0.5	±30	0.25V	220	—	—	4	I50	6A,9A
2	**μA1489A**	Quad RS232	μA1488	TTL	+0.5	±30	1.0V	25	—	—	4	I50	6A,9A
3	**8T14**	Triple	8T13	TTL	—	+5.0	Yes	20	+5.0	315	3	I22	6B,9B
4	**8T24**	Triple IBM-370	8T23	TTL	—	+5.0	Yes	20	+5.0	315	3	I22	6B,9B
5	**9582**	Triple	All ECL Logic	ECL	V_{REF}	±1.0	No	2.2	-5.2	250	3	E22	6B
6	**9613**	Dual Diff	9612	TTL	±0.5	±15	No	25	+5.0	143	2	I24	6T,9T
7	**9615**	Dual Diff	9614	TTL	±1.0	±15	No	30	+5.0	150	2	I3	4L,6B,9B
8	**9617**	Triple RS232	9616	TTL	+1.5	±25	Yes	60	+5.0	60	3	I5	6A
9	**9620**	Dual Diff	9621	TTL	±0.5	±15	No	35	+5.0 -12	110	2	I6	3I,6A
10	**9622**	Dual	9621	TTL	+1.5	±10	No	38	+5.0 -12	140	2	I8	3I,6A
11	**9627**	Dual RS232/ mil. std. 188	9616	TTL	+0.45	±25	No	70	±12	234	2	I11	4L 6B,9B
12	**9637A**	Dual RS422/423	9634, 9636, 9638	TTL	+0.2	±15	0.3V	17	+5.0	—	2	I35	6T,9T
13	**10014**	Active Terminator	All ECL Logic	ECL	V_{REF}	—	No	—	-5.2	65	14	E18	4L 6B,9B
14	**10114/ 10514**(2)	Triple	All ECL Logic	ECL	V_{REF}	±1.0	No	2.2	-5.2	145	3	E24	4L 6B,9B
15	**10115/ 10515**(2)	Quad	All ECL Logic	ECL	V_{REF}	+2.0	No	1.9	-5.2	95	4	E23	4L 6B,9B
16	**10116**	Triple	All ECL Logic	ECL	V_{REF}	+2.0	No	1.9	-5.2	75	3	E24	4L 6B,9B
17	**55/75107**	Dual	75109 75110	TTL	±25	±3.0	No	17	±5.0	130	2	I13	3I 6A,9A
18	**55/75108**	Dual	75109 75110	TTL	±25	±3.0	No	19	±5.0	130	2	I13	3I 6A,9A

1. In some cases, only commercial temperature range devices are given. Please request specific information for military versions.
2. 105XX and 106XX denote military temperature range.

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LINE DRIVERS/RECEIVERS/TRANSCEIVERS

LINE RECEIVERS (Cont'd)

Item	DEVICE NO.[1]	Function	Companion Driver	Output Compatibility	Input Threshold Sensitivity V_{TH}-V	Common Mode V	Hysteresis Capability	tpd-ns (Typ)	Supply Voltage V	Power Dissipation mW (Typ)	Receivers per Package	Logic/Connection Diagram	Package(s)
1	**55/75122**	Triple	75121	TTL	—	+5.0	Yes	20	+5.0	315	3	I22	6B,9B
2	**75124**	Triple IBM-370	75123	TTL	—	+5.0	Yes	20	+5.0	315	3	I22	6B,9B
3	**75154**	Quad RS232	75150	TTL, DTL	2.2	±15	Yes	22	+5.0 +12	200	4	I38	6A,9A
4	**75207**	Dual	75109 75110	TTL	±10	±3.0	No	17	±5.0	130	2	I13	6A,9A
5	**75208**	Dual	75109 75110	TTL	±10	±3.0	No	19	±5.0	130	2	I13	6A,9A
6	**95115**	Quad	All ECL Logic	ECL	V_{REF}	+2.0	No	1.9	-5.2	95	4	E23	6B
7	**95116**	Triple	All ECL Logic	ECL	V_{REF}	+2.0	No	1.9	-5.2	75	3	E24	6B
8	**96106**	Quad 2-NOR Bus	96101	TTL	1.5	—	No	20	+5.0	90	4	D39	TO-86 6A,9A
9	**100114**	Quint	All ECL Logic	ECL	V_{REF}	±1.0	No	1.2	-4.5	380	5	E25	4Q

TRANSCEIVERS

Item	DEVICE NO.	Function[2]	Driver Output Current-mA	Receiver Output Current-mA	Hysteresis Capability	Receiver t_{pd}-ns	Driver t_{pd}-ns	Tranceivers per Package	Logic/Connection Diagram	Package(s)
10	**8T26**	Quad 3S	40	16	—	13	16	4	I53	6B,9B
11	**8T28**	Quad 3S	40	16	—	13	16	4	I54	6B,9B
12	**9640/26S10**	Quad OC Inverting	100	20	—	15	18	4	I37	6B,9B
13	**9641/26S11**	Quad OC	100	20	—	15	20	4	I55	6B,9B
14	**9642**	Quad OC Inverting	100	20	0.6V	15	18	4	I56	6B,9B

1. In some cases, only commercial temperature range devices are given. Please request specific information for military versions.
2. OC = open collector, 3S = 3-state

LINE DRIVERS/RECEIVERS/TRANSCEIVERS

TRANCEIVERS (Cont'd)

Item	DEVICE NO.	Function[2]	Driver Output Current-mA	Receiver Output Current-mA	Hysteresis Capability	Receiver t_{pd}-ns	Driver t_{pd}-ns	Tranceivers per Package	Logic/Connection Diagram	Package(s)
1	**54LS/74LS242**	Quad Inverting 3S	40	40	0.4V	12	12	4	D75	3I,6A,9A
2	**54LS/74LS243**	Quad 3S	40	40	0.4V	12	12	4	D76	3I,6A,9A
3	**54LS[1]/74LS245**	Octal 3S	40	40	0.4V	12	12	8	D79	9Z
4	**100194[1]**	Duplex	—	—	—	2.0	1.1	5	E110	4Q,6Q

DISPLAY DRIVERS

DISPLAY DRIVERS

Item	DEVICE NO.	Function[2]	Input Compatibility	BCD Decoder	Ripple Blanking	Blanking Above BCD 9 Input	Output Current mA	Output Standoff Voltage-V (Max)	Active HIGH/LOW	Display Type	Standby Power Dissipation-mW	Logic/Connection Diagram	Package(s)
5	**4511B**	7-Seg Latch/ Decoder/Dvr	CMOS	Yes	No	Yes	25	—	H	LED	0.015	C111	4L,6B, 9B
6	**4734B**	7-Seg Latch/ Decoder/Dvr	CMOS	Yes	Yes	Yes	25	—	H	LED	0.015	C114	7D,9M
7	**4543B**	7-Seg Latch/ Decoder/Dvr	CMOS	Yes	No	Yes	—	—	H	LCD	0.015	C112	4L,6B, 9B
8	**54/7441**	1-of-10 Cold Cathode	TTL	Yes	No	No	7.0	55	L	Gas Discharge	145	D140	4L,6B, 9B
9	**54/7445**	1-of-10 OC Dvr	TTL	Yes	No	Yes	80	30	L	Common Anode	215	D135	4L,7B, 9B
10	**54/7446**	7-Seg Decoder/Dvr	TTL	Yes	Yes	No	40	30	L	Common Anode	320	D143	4L,7B 9B
11	**54/7447**	7-Seg Decoder/Dvr	TTL	Yes	Yes	No	40	15	L	Common Anode	320	D143	4L,7B, 9B
12	**54LS/ 74LS47**	7-Seg Decoder/Dvr	TTL	Yes	Yes	No	12	15	L	Common Anode	35	D143	4L,6B, 9B
13	**54/7448**	7-Seg Decoder	TTL	Yes	Yes	No	8.0	5.5	H	—	265	D141	4L,7B, 9B

1. To be announced
2. OC = open collector, 3S = 3-state

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DISPLAY DRIVERS

DISPLAY DRIVERS (Cont'd)

Item	DEVICE NO.	Function*	Input Compatibility	BCD Decoder	Ripple Blanking	Blanking Above BCD 9 Input	Output Current mA	Output Standoff Voltage-V (Max)	Active HIGH/LOW	Display Type	Standby Power Dissipation-mW	Logic/Connection Diagram	Package(s)
1	**54LS/ 74LS48**	7-Seg Decoder/Dvr	TTL	Yes	Yes	No	1.3	5.5	H	—	125	D141	4L,6B, 9B
2	**5449**	7-Seg Decoder	TTL	Yes	Yes	No	9.6	5.5	H	—	165	D142	3I
3	**54LS/ 74LS49**	7-Seg Decoder/ Dvr OC	TTL	Yes	Yes	No	1.3	5.5	H	—	40	D142	3I,6A, 9A
4	**9302**	1-of-10 OC Dvr	TTL	Yes	No	Yes	16	5.5	L	—	145	D133	4L,6B, 9B
5	**9307**	7-Seg Decoder	TTL	Yes	Yes	No	11	5.5	H	LED, Com Cathode	165	D141	4L,7B, 9B
6	**9315**	1-of-10 Cold Cathode	TTL	Yes	No	No	7.0	55	L	Gas Discharge	145	D140	4L,6B, 9B
7	**9317B**	7-Seg Decoder/Dvr	TTL	Yes	Yes	Yes	40	20	L	LED, Com Anode	220	D143	4L,7B, 9B
8	**9317C**	7-Seg Decoder/Dvr	TTL	Yes	Yes	Yes	20	30	L	LED, Com Anode	220	D143	4L,7B, 9B
9	**9368**	7-Seg LED Dvr	TTL	Yes	Yes	No	20	1.7	H	LED, Com Cathode	320	D144	7B,9B
10	**9370**	7-Seg LED Dvr	TTL	Yes	Yes	No	25	5.5	L	LED, Com Anode	350	D145	6B,9B
11	**9374**	7-Seg LED Dvr	TTL, CMOS	Yes	Yes	No	15	10	L	LED, Com Anode	175	D145	6B,9B
12	**9664**	Hex Digit Dvr	MOS, TTL, CMOS	No	No	No	150	20	L	LED	Neg	I26	6A,9A
13	**9665**	7-Darlington Dvr	DTL, TTL MOS, CMOS	No	No	No	350	50	L	LED, Gas Discharge	0	I39	6B,9B
14	**9666**	7-Darlington Dvr	PMOS	No	No	No	350	50	L	LED, Gas Discharge	0	I39	6B,9B
15	**9667**	7-Darlington Dvr	TTL, CMOS	No	No	No	350	50	L	LED, Gas Discharge	0	I39	6B,9B
16	**9668**	7-Darlington Dvr	CMOS, PMOS	No	No	No	350	50	L	LED, Gas Discharge	0	I39	6B,9B

*OC = open collector, 3S = 3-state

DISPLAY DRIVERS

DISPLAY DRIVERS (Cont'd)

Item	DEVICE NO.	Function*	Input Compatibility	BCD Decoder	Ripple Blanking	Blanking Above BCD 9 Input	Output Current mA	Output Standoff Voltage-V (Max)	Active HIGH/LOW	Display Type	Standby Power Dissipation-mW	Logic/Connection Diagram	Package(s)
1	**54/ 74141**	1-of-10 Cold Cathode	TTL	Yes	No	No	7.0	55	L	Gas Discharge	80	D140	4L,7B, 9B
2	**54/ 74145**	1-of-10 OC Dvr	TTL	Yes	No	Yes	80	15	L	Common Anode	215	D135	4L,7B, 9B
3	**54LS/ 74LS247**	7-Seg Decoder/Dvr	TTL	Yes	Yes	No	12	15	L	LED, Com Anode	30	D143	4L,6B, 9B
4	**54LS/ 74LS248**	7-Seg Decoder/Dvr	TTL	Yes	Yes	No	1.3	5.5	H	—	125	D141	4L,6B, 9B
5	**54LS/ 74LS249**	7-Seg OC Decoder/Dvr	TTL	Yes	Yes	No	1.3	5.5	H	—	40	D141	4L,6B, 9B
6	**75491**	Quad Digit Seg Dvr	MOS, TTL, CMOS	No	No	No	50	20	L	LED	Neg	I25	TO-99, 6T,9A, 9T
7	**75492**	Hex Digit Dvr	MOS, TTL, CMOS	No	No	No	250	20	L	LED	Neg	I26	TO-99, 6T,9A, 9T

*OC = open collector, 3S = 3-state

AUXILIARY DRIVERS

HIGH SPEED BUFFERS AND PERIPHERAL DRIVERS

Item	DEVICE NO.	Function	Input Compatibility	Gate Function	Circuit Function	Transistor Connection Mode	Output Current mA	Output Voltage V	Latchup Voltage mV (Min)	t_{pd}-ns (Typ)	Drivers per Package	Logic/Connection Diagram	Package(s)
8	**55/75430**	Dual Drivers	TTL	AND	AND	External	300	15	15	15	2	I16	3I,6A,9A
9	**55/75431**	Dual Drivers	TTL	AND	AND	Internal	300	15	15	10	2	I17	TO-99 6T,9T
10	**55/75432**	Dual Drivers	TTL	NAND	NAND	Internal	300	15	15	15	2	I18	TO-99 6T,9T
11	**55/75433**	Dual Drivers	TTL	OR	OR	Internal	300	15	15	10	2	I19	TO-99 6T,9T

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AUXILIARY DRIVERS

HIGH SPEED BUFFERS AND PERIPHERAL DRIVERS (Cont'd)

Item	DEVICE NO.	Function	Input Compatibility	Gate Function	Circuit Function	Transistor Connection Mode	Output Current mA	Output Voltage V	Latchup Voltage mV (Min)	t_{pd}-ns (Typ)	Drivers per Package	Logic/Connection Diagram	Package(s)
1	**55/75434**	Dual Drivers	TTL	NOR	NOR	Internal	300	15	15	13	2	I20	TO-99 6T,9T
2	**55/75450**	Dual Drivers	TTL	AND	AND	External	300	30	20	30	2	I16	3I,6A,9A
3	**55/75451**	Dual Drivers	TTL	AND	AND	Internal	300	30	20	25	2	I17	TO-99 6T,9T
4	**55/75452**	Dual Drivers	TTL	AND	NAND	Internal	300	30	20	35	2	I18	TO-99 6T,9T
5	**55/75453**	Dual Drivers	TTL	NOR	OR	Internal	300	30	20	25	2	I19	TO-99 6T,9T
6	**55/75454**	Dual Drivers	TTL	OR	NOR	Internal	300	30	20	35	2	I20	TO-99 6T,9T

HIGH CURRENT, HIGH VOLTAGE BUFFERS AND PERIPHERAL DRIVERS

Item	DEVICE NO.	Function	Input Compatibility	Gate Function	Circuit Function	Output Current mA (Max)	Output Voltage-V	Latchup Voltage V (Min)	t_{pd}-ns (Typ)	Drivers per Package	Logic/Connection Diagram	Package(s)
7	**SH2001**	High Current, High Voltage	DTL, TTL	—	NAND	1000	50	—	70	1	H5	TO-100
8	**SH2002**	High Current, High Voltage	DTL, TTL	—	NAND	1000	40	—	70	1	H5	TO-100
9	**SH2200**	High Current, High Voltage	DTL, TTL	—	NAND	2000	50	—	80	1	H5	TO-100
10	**SH2201**	High Current High Voltage	DTL, TTL	—	NAND	2000	100	—	—	1	H5	TO-100
11	**SH3011***	Dual Hammer	TTL	—	Non-Inverting	5000	80	—	—	2	H8	8-pin TO-3
12	**9664**	Hex Driver	TTL, MOS, CMOS	—	—	150	20	—	600	6	I26	6A,9A
13	**55/75450**	Dual Drivers	TTL	NAND	—	300	30	20	30	2	I16	3I,6A,9A

*To be announced

AUXILIARY DRIVERS

HIGH CURRENT, HIGH VOLTAGE BUFFERS AND PERIPHERAL DRIVERS (Cont'd)

Item	DEVICE NO.	Function	Input Compatibility	Gate Function	Circuit Function	Output Current mA (Max)	Output Voltage-V	Latchup Voltage V (Min)	t_{pd}-ns (Typ)	Drivers per Package	Logic/Connection Diagram	Package(s)
1	**55/75451**	Dual Drivers	TTL	—	AND	300	30	20	30	2	I17	TO-99 6T,9T
2	**55/75452**	Dual Drivers	TTL	—	NAND	300	30	20	35	2	I18	TO-99 6T,9T
3	**55/75453**	Dual Drivers	TTL	—	OR	300	30	20	25	2	I19	TO-99 6T,9T
4	**55/75454**	Dual Drivers	TTL	—	NOR	300	30	20	35	2	I20	TO-99 6T,9T
5	**55/75460**	Dual Drivers	TTL	NAND	—	300	35	30	35	2	I16	3I,6A,9A
6	**55/75461**	Dual Drivers	TTL	—	AND	300	35	30	35	2	I17	TO-99 6T,9T
7	**55/75462**	Dual Drivers	TTL	—	NAND	300	35	30	35	2	I18	TO-99 6T,9T
8	**55/75463**	Dual Drivers	TTL	—	OR	300	35	30	35	2	I19	TO-99 6T,9T
9	**55/75464**	Dual Drivers	TTL	—	NOR	300	35	30	35	2	I20	TO-99 6T,9T
10	**55/75471**	Dual Drivers	TTL	—	AND	300	80	55	30	2	I17	TO-99 6T,9T
11	**55/75472**	Dual Drivers	TTL	NAND	NAND	300	80	55	45	2	I18	TO-99 6T,9T
12	**55/75473**	Dual Drivers	TTL	—	OR	300	80	55	30	2	I19	TO-99 6T,9T
13	**55/75474**	Dual Drivers	TTL	—	NOR	300	80	55	40	2	I20	TO-99 6T,9T
14	**75491**	Quad Driver	TTL, MOS, CMOS	—	—	50	20	—	600	4	I25	TO-99 6T,9A,9T
15	**75492**	Hex Driver	TTL, MOS, CMOS	—	—	250	20	—	600	6	I26	TO-99 6T,9A,9T

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AUXILIARY DRIVERS

MOS, CCD AND CORE MEMORY DRIVERS

Item	DEVICE NO.	Function	Input Compatibility	Output Current (Capacitive Drive Capability) mA (pF)	t_{pd}-ns (Typ)	Supply Voltage V	Logic/Connection Diagram(s)	Package(s)
1	**9643**	Dual TTL to CCD/MOS Dvr	TTL	(300)	8.0	+5.0	I57,58	6A,6T,9A,9T
2	**9644**	Dual TTL to CCD/MOS Dvr	TTL	(300)	8.0	+5.0	I57	6T,9T
3	**9645**	Quad TTL to CCD/MOS Dvr	TTL	(300)	8.0	+5.0	I59	6B,9B
4	**9646**	Dual MOS Clock Dvr	TTL	(1000)	30	-22 to +22	I60,61	6A,9A,9T
5	**55/75325**	Core Memory Dvr	TTL	600	25	+5.0, +24	I15	4L,7B,9B
6	**55/75326**	Core Memory Dvr	TTL	600	30	+5.0	I68	4L,7B,9B
7	**55/75327**	Core Memory Dvr	TTL	600	35	+5.0 or +4.5 to +24	I69	4L,7B,9B

LEVEL TRANSLATORS

LEVEL TRANSLATORS

Item	DEVICE NO.(1,2)	Function	Supply Voltage V^+ (Typ)	Supply Voltage V^- (Typ)	V_{OH}-V (Min)	V_{OL}-V (Max)	t_{pd}-ns (Typ)	Power Dissipation mW	Logic/Connection Diagram(s)	Package(s)
8	**4049B**	Hex Inverting Buffer	+3.0 to +15	0.0	-2.5(3)	+16(4)	—	—	C12	4L, 6B,9B
9	**4050B**	Hex Non-Inverting Buffer	+3.0 to +15	0.0	-2.5(3)	+16(4)	—	—	C13	4L, 6B,9B
10	**4104B**	TTL to Logic HIGH MOS	+3.0 to +15	0.0	+9.95	+0.05	85	1.4	C62	4L, 6B,9B
11	**9109**	HLDTL-TTL Hex	+12 to +20	0.0	OC	+0.4	120	380	G12	6A

1. In some cases, only commercial temperature range devices are given. Please request specific information for military versions.
2. 105XX and 106XX denote military temperature range.
3. I_{OH}-mA
4. I_{OL}-mA

LEVEL TRANSLATORS

LEVEL TRANSLATORS (Cont'd)

Item	DEVICE NO.[1,2]	Function	Supply Voltage V^+ (Typ)	Supply Voltage V^- (Typ)	V_{OH}-V (Min)	V_{OL}-V (Max)	t_{pd}-ns (Typ)	Power Dissipation mW	Logic/Connection Diagram(s)	Package(s)
1	**9112**	TTL-HLDTL Hex	+12 to +20	0.0	(+V)-2.0	+0.4	90	440	G12	6A
2	**9595**	Dual ECL-TTL	+5.0	-5.2	+2.4	+0.4	6.0	375	E15	6B
3	**9624**	TTL-MOS	+5.0	0.0 to -30	V_{TAP}-1.0	(-V)+2.0	120	40	I9	3I,6A,9A
4	**9625**	MOS-TTL Dual	+5.0	0.0 to -30	+3.2	+0.4	70	60	I10	3I,6A,9A
5	**9643**	Dual TTL to MOS Driver	+5.0 to +12	0.0	V_{CC}-0.5	+0.3	8.0	—	I57, 58	6A,6T, 9A,9T
6	**9644**	Dual TTL to MOS Driver	+5.0 to +12	0.0	V_{CC}-0.5	+0.3	8.0	—	I57	6T,9T
7	**9645**	Quad TTL to MOS Driver	+5.0	0.0	V_{CC}-0.5	+0.3	8.0	—	I59	6B,9B
8	**9646**	Dual MOS Clock Driver	-22 to +22	0.0	V_{CC}-0.5	+1.0	30	—	I60, 61	6A,9A 9T
9	**11C24**	Dual TTL Voltage Controlled Multivibrator	+5.0	—	+2.5	+0.5	30	160	E19	6A
10	**11C44**	Phase-Freq Detector	+5.0	—	+2.5	+0.5	—	165	E20	6A
11	**11C58**	ECL Voltage Controlled Multivibrator	+5.0	-5.2	-0.96	-1.62	—	260	E21	6B
12	**10124/ 10524**	TTL-ECL Quad Diff Driver	+5.0	-5.2	-0.96	-1.65	3.0	265	E16	4L,6B, 9B
13	**10125/ 10525**	ECL-TTL Quad Buffer	+5.0	-5.2	+2.5	+0.5	3.0	410	E17	4L,6B 9B
14	**10177**	ECL to MOS	+5.0 or +6.0	-5.2	+3.0 or +4.0	+0.5 or +0.6	6.0	430	E106	4L,6B 9B
15	**95124**	TTL-ECL Quad Diff Driver	+5.0	-5.2	-1.05	-1.595	3.0	295	E16	6B

1. In some cases, only commercial temperature range devices are given. Please request specific information for military versions.
2. 105XX and 106XX denote military temperature range.

8

CONVERTERS

CONVERTERS

Item	DEVICE NO.	Function	Input Compatibility	Output Current MSB-mA (Max)	Non-Linearity % (Full Scale)	Output Current Settling Time ns	Logic/Connection Diagram	Package(s)
1	**μA0801/ DAC-08**	8-Bit High Speed Digital-to-Analog Converter	TTL, CMOS, ECL, HTL, MOS	2.0	±0.1	85	I62	6B,9B
2	**μA0802/ 1408**	8-Bit Multiplying Digital-to-Analog Converter	TTL, CMOS	2.0	±0.19	250	I63	6B,9B
3	**μA4151**	Voltage-to-Frequency Converter	TTL, CMOS	—	—	—	I64	5S,6T,9T
4	**μA7151**	Voltage-to-Frequency Converter w/Op Amp	TTL, CMOS	—	—	—	I65	6A,9A
5	**9650**	4-Bit Current Source	TTL	2.0	±0.1	—	I12	6B
6	**9706**(1)	8-Channel, 6-Bit Microprocessor, Digital-to-Analog Converter	TTL	—	—	—	I66	6A,9A
7	**9708**(1)	6-Channel, 8-Bit Microprocessor, Analog-to-Digital Converter	TTL	—	±0.2	—	I67	6B,9B
8	**9710**(1)	10-Bit High Speed Digital-to-Analog Converter	TTL, CMOS, ECL	8.0	±0.25	200	—	6N,9N
9	**9712**(1)	12-Bit High Speed Digital-to-Analog Converter	TTL, CMOS, ECL	8.0	±0.25	300	—	6N,9N

AMPLIFIERS

CORE SENSE AMPLIFIERS

Item	DEVICE NO.(2)	Function	Differential Threshold Voltage Range VREF = 15mV mV	Common Mode Range V	Gate Function	Output Configuration	tpd-ns (Typ)	Logic/Connection Diagram	Package(s)
10	**7524**	Dual Sense Amp	11 to 19	±2.5	AND	Com Collector	25	I30	6B,9B
11	**7525**	Dual Sense Amp	8.0 to 22	±2.5	AND	Com Collector	25	I30	6B,9B
12	**7528**	Dual Sense Amp	11 to 19	±2.5	AND	Com Collector	25	I31	6B,9B
13	**7529**	Dual Sense Amp	8.0 to 22	±2.5	AND	Com Collector	25	I31	6B,9B

1. To be announced
2. In some cases, only commercial temperature range devices are given. Please request specific information for military versions.

AMPLIFIERS

CORE SENSE AMPLIFIERS

Item	DEVICE NO.*	Function	Differential Threshold Voltage-mV	Common Mode Range V	Gate Function	Output Configuration	t_{pd}-ns (Typ)	Logic/Connection Diagram	Package(s)
1	**7534**	Dual Sense Amp	11 to 19	±2.5	NAND	Uncom Collector	25	I32	6B,9B
2	**7535**	Dual Sense Amp	8.0 to 22	±2.5	NAND	Uncom Collector	25	I32	6B,9B
3	**75234**	Dual Sense Amp	11 to 19	±2.5	NAND	Com Collector	25	I32	6B,9B
4	**75235**	Dual Sense Amp	8.0 to 22	±2.5	NAND	Com Collector	25	I32	6B,9B

TAPE/DISC PREAMPLIFIERS

Item	DEVICE NO.	Function	Voltage Gain V/V (Typ)	Bandwidth Unity Gain MHz (Typ)	Input Offset Current μA (Typ)	Input Offset Voltage mV (Typ)	Output Voltage Swing V (Typ)	Logic/Connection Diagram	Package(s)
5	**μA733**	Diff Video Amp	400	120	0.4	0.6	2.5	I1	TO-91 5B,6A,9A
6	**μA739**	Dual Low Noise Preamp	20	1.0	0.05	1.0	+12,−14	I48	6A,9A

* In some cases, only commercial temperature range devices are given. Please request specific information for military versions.

8

SWITCHES

ANALOG SWITCHES

Item	DEVICE NO.	Description	Input Logic	Channel Resistance Ω (Max)	Supply Voltage V	Logic/Connection Diagram	Packages
1	**SH3002**	SPDT Analog Switch	TTL	200	±12	H6	TO-100
2	**SH3003**	DPST Analog Switch	TTL	200	±12	H7	TO-100
3	**4016B**	Quad Bilateral SPST Switch	CMOS	1080	3.0 to 15	C63	3I,6A,9A
4	**4051B**	8-Chan Analog Multiplexer	CMOS	340	3.0 to 15	C65	4L,6B,9B
5	**4052B**	Dual 4-Chan Analog Multiplexer	CMOS	340	3.0 to 15	C64	4L,6B,9B
6	**4053B**	Triple 2-Chan Analog Multiplexer	CMOS	340	3.0 to 15	C96	4L,6B,9B
7	**4066B**	Quad Bilateral SPST Switch	CMOS	300	3.0 to 15	C63	3I,6A,9A
8	**4067B**	16-Chan Analog Multiplexer	CMOS	340	3.0 to 15	C97	4M,6N,9N
9	**4741B**	4x4 Crosspoint Switch	CMOS	340	3.0 to 15	C98	4L,6B,9B

SPECIAL FUNCTIONS

TIMERS AND COUNTERS

Item	DEVICE NO.*	Function	Time Delay Hrs	Free Running Frequency KHz	Output Compatibility	Output Current mA	Supply Voltage V (Max)	Timing Error %	Logic/Connection Diagram	Package(s)
10	**μA555**	Single Timer	1.0	100	TTL	200	18	1.0	I28	5B,9T
11	**μA556**	Dual Timer	1.0	100	TTL	200	18	1.0	I29	7B,9B
12	**μA2240**	Programmable Timer-Counter	120	—	TTL	5.0	18	0.5	I27	7B,9B

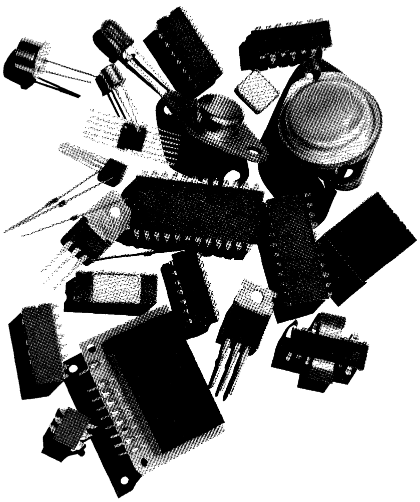
*In some cases, only commercial temperature range devices are given. Please request specific information for military versions.

SPECIAL FUNCTIONS

ARRAYS

Item	DEVICE NO.*	Function	Balanced Input	Balanced Output	Low Noise	AGC Capability	Multiple Unit	Wideband	Switching Application	V_{CBO}-V	V_{CEO}-V	V_{EBO}-V	I_C-mA	Diode Matching mV	Reverse Recovery Time-ns	Logic/Connection Diagram	Package(s)
1	**μA726**	Temp Controlled Diff Pair	•	•	•	—	—	—	—	40	30	5.0	5.0	—	—	140	5U
2	**μA3018**	Matched Transistor Array	•	•	—	•	•	•	—	20	15	5.0	50	—	—	141	5G
3	**μA3018A**	Matched Transistor Array	•	•	—	•	•	•	—	20	15	5.0	50	—	—	141	5G
4	**μA3019**	Diode Array	—	—	—	—	—	—	•	—	—	—	—	1.0	—	147	5E
5	**μA3026**	Dual Diff Amp Transistor Array	—	—	—	—	—	—	—	20	15	5.0	50	—	—	144	5G
6	**μA3036**	Dual Darlington Transistor Array	•	•	•	—	•	—	—	30	15	5.0	50	—	—	142	5E
7	**μA3039**	Quad Plus Two Diodes	—	—	—	—	—	—	•	—	—	—	—	1.0	1.0	146	5G
8	**μA3045**	Diff Pair Plus Three Transistors	•	•	—	—	•	•	—	20	15	5.0	50	—	—	143	6A
9	**μA3046**	Diff Pair Plus Three Transistors	•	•	—	—	•	•	—	20	15	5.0	50	—	—	143	6A, 9A
10	**μA3054**	Dual Diff Amp Transistor Array	—	—	—	—	•	—	—	20	15	5.0	50	—	—	145	6A 9A
11	**μA3086**	Diff Pair Plus Three Transistors	•	•	—	—	•	•	—	20	15	5.0	50	1.0	—	143	6A

*Military grade available.



TTL

SSI FUNCTIONS

Item	Function(1)	9000 Series 8 ns/10 mW	Low Power Schottky 54LS/74LS 5 ns/2 mW	Std. TTL 54/74 10 ns/10 mW	High Speed 54H/74H 6 ns/22 mW	High Speed Schottky 54S/74S 3 ns/19 mW	Logic/Connection Diagram(2)	Packages(3)
NAND Gates								
1	Hex Inverters	9016	54LS/74LS04	54/7404	54H/74H04	54S/74S04 9S04A	D1	3I,6A,9A
2	Hex Inverts (OC)	9017	54LS/74LS05	54/7405	54H/74H05	54S/74S05 9S05A	D1	3I,6A,9A
3	Hex Inverter (15 V)	—	—	54/7416	—	—	D1	3I,6A,9A
4	Hex Inverter (30 V)	—	—	54/7406	—	—	D1	3I,6A,9A
5	Hex Schmitt Trigger	—	54LS/74LS14	54/7414	—	—	D1	3I,6A,9A
6	Quad 2-Input	9002	54LS/74LS00	54/7400	54H/74H00	54S/74S00	D2	3I,6A,9A
7	Quad 2-Input (OC)	9012	54LS/74LS03	54/7403	54H/74H01	54S/74S03	D2	3I,6A,9A
8	Quad 2-Input (OC)	—	—	54/7401	—	—	D3	3I,6A,9A
9	Quad 2-Input (12 V)	—	54LS/74LS26	7426	—	—	D2	3I,6A,9A
10	Quad 2-Input (48 mA)	—	54LS/74LS37	54/7437	—	—	D2	3I,6A,9A
11	Quad 2-Input (OC/48 mA)	—	74LS38	54/7438	—	—	D2	3I,6A,9A
12	Quad 2-Input Line Dvr	96101	—	54/7439	—	—	D3	3I,6A,9A
13	Quad 2-Input Schmitt	—	74LS132	54/74132	—	54S/74S132	D2	3I,6A,9A
14	Triple 3-Input	9003	54LS/74LS10	54/7410	54H/74H10	54S/74S10	D4	3I,6A,9A
15	Triple 3-Input (OC)	—	—	54/7412	—	—	D4	3I,6A,9A
16	Dual 4-Input	9004	54LS/74LS20	54/7420	54H/74H20	74S20	D5	3I,6A,9A
17	Dual 4-Input Schmitt	—	54LS/74LS13	54/7413	—	—	D65	3I,6A,9A
18	Dual 4-Input (OC)	—	54LS/74LS22	54/7422	54H/74H22	74S22	D5	3I,6A,9A
19	Dual 4-Input Buffer	9009	54LS/74LS40	54/7440	54H/74H40	54S/74S40	D5	3I,6A,9A
20	Dual 4-Input Line Dvr	—	—	—	—	54S/74S140	D5	3I,6A,9A
21	8-Input	9007	—	—	—	—	D6	3I,6A
22	8-Input	—	54LS/74LS30	54/7430	54H/74H30	54S/74S30	D7	3I,6A,9A
23	13-Input	—	54LS/74LS133	—	—	54S/74S133	D8	4L,6B,9B
24	12-Input (3S)	—	—	—	—	54S/74S134	D9	4L,6B,9B

Notes on following pages.

TTL

SSI FUNCTIONS (Cont'd)

Item	Function(1)	9000 Series 8 ns/10 mW	Low Power Schottky 54LS/74LS 5 ns/2 mW	Std. TTL 54/74 10 ns/10 mW	High Speed 54H/74H 6 ns/22 mW	High Speed Schottky 54S/74S 3 ns/19 mW	Logic/Connection Diagram(2)	Packages(3)
NOR Gates								
1	Quad 2-Input	—	54LS/74LS02	54/7402	—	54S/74S02	D10	3I,6A,9A
2	Quad 2-Input	9015	—	—	—	—	D11	4L,6B
3	Triple 3-Input	—	54LS/74LS27	54/7427	—	—	D12	3I,6A,9A
4	Dual 4-Input w/Strobe	—	—	54/7425	—	—	D13	3I,6A,9A
5	Dual 4-Input (Exp)	—	—	54/7423	—	—	D14	4L,6B,9B
6	Dual 5-Input	—	54LS/74LS260	—	—	—	D72	3I,6A,9A
7	Quad 2-Input	—	54LS/74LS28	—	—	—	D10	3I,6A,9A
8	Quad 2-Input (OC)	—	74LS33	—	—	—	D10	6A,9A
AND Gates								
9	Hex Buffer (OC/15 V)	—	—	54/7417	—	—	D15	3I,6A,9A
10	Hex Buffer (OC/30 V)	—	—	54/7407	—	—	D15	3I,6A,9A
11	Quad 2-Input	—	54LS/74LS08	54/7408	54H/74H08	54S/74S08	D16	3I,6A,9A
12	Quad 2-Input (OC)	—	54LS/74LS09	54/7409	—	54S/74S09	D16	3I,6A,9A
13	Quad 2-2-3-3 Input	—	—	—	—	9S41	D17	4L,6B,9B
14	Triple 3-Input	—	54LS/74LS11	54/7411	54H/74H11	54S/74S11	D18	3I,6A,9A
15	Triple 3-Input (OC)	—	54LS/74LS15	—	—	54S/74S15	D18	3I,6A,9A
16	Dual 4-Input	—	54LS/74LS21	54/7421	54H/74H21	—	D19	3I,6A,9A
OR Gates								
17	Quad 2-Input	—	54LS/74LS32	54/7432	—	54S/74S32	D20	3I,6A,9A
Exclusive OR Gates								
18	Quad 2-Input	—	54LS/74LS86	54/7486	—	54S/74S86	D21	3I,6A,9A
19	Quad 2-Input (OC)	—	54LS/74LS136	—	—	—	D21	3I,6A,9A
20	Quad 2-Input OR/NOR	9014	—	—	—	—	D22	4L,6B
21	Quad 2-Input OR/NOR	—	—	—	—	54S/74S135	D23	4L,6B,9B
22	Quad 2-Input	—	54LS/74LS386	—	—	—	D94	3I,6A,9A

Notes on following pages.

TTL

SSI FUNCTIONS (Cont'd)

Item	Function[1]	9000 Series 8 ns/10 mW	Low Power Schottky 54LS/74LS 5 ns/2 mW	Std. TTL 9N 54/74 10 ns/10 mW	High Speed 54H/74H 6 ns/22 mW	High Speed Schottky 54S/74S 3 ns/19 mW	Logic/Connection Diagram[2]	Packages[3]
Exclusive NOR Gate								
1	Quad 2-Input (OC)	—	74LS266	9386 (8242)	—	—	D94	3I,6A,9A
AND-OR Gates								
2	Dual 4-2 Input	—	—	—	—	9S42	D25	4L,6B,9B
3	2-2-2-3 Input (Exp)	—	—	—	54H/74H52	—	D26	3I,6A,9A
AND-OR-INVERT Gates								
4	Dual 2-2 Input (Exp)	9005	—	54/7450	54H/74H50	—	D27	3I,6A,9A
5	Dual 2-2 Input	—	54LS/74LS51	54/7451	54H/74H51	54S/74S51	D28	3I,6A,9A
6	2-2-2-3 Input (Exp)	9008	—	54/7453	54H/74H53	—	D29	3I,6A,9A
7	2-2-2-3 Input	—	—	54/7454	54H/74H54	—	D30	3I,6A,9A
8	2-2-3-3 Input	—	54LS/74LS54	—	—	—	D31	3I,6A,9A
9	2-2-3-4 Input	—	—	—	—	74S64	D32	6A,9A
10	2-2-3-4 Input (OC)	—	—	—	—	74S65	D32	6A,9A
11	4-4 Input (Exp)	—	—	—	54H/74H55	—	D33	3I,6A,9A
12	4-4 Input	—	54LS/74LS55	—	—	—	D34	3I,6A,9A
Gate Expanders								
13	Triple 3-Input	—	—	—	54H/74H61	—	D35	3I,6A,9A
14	Dual 4-Input	9006	—	54/7460	54H/74H60	—	D36	3I,6A,9A
15	2-2-3-3 AND-OR	—	—	—	54H/74H62	—	D37	3I,6A,9A
Buffer Gates and Drivers								
16	Quad Buffer (3S)	—	54LS/74LS125	54/74125	—	—	D66	3I,6A,9A
17	Quad Buffer (3S)	—	54LS/74LS126	54/74126	—	—	D67	3I,6A,9A
18	Hex (3S)	—	54LS/74LS365	—	—	—	D68	4L,6B,9B
19	Hex Inverter (3S)	—	54LS/74LS366	—	—	—	D69	4L,6B,9B
20	Hex (3S)	—	54LS/74LS367	—	—	—	D70	4L,6B,9B
21	Hex Inverter (3S)	—	54LS/74LS368	—	—	—	D71	4L,6B,9B

1. OC = open collector, 3S = 3-state.
2. The logic symbols located in the Logic/Connection Diagram Section are for the DIP version.
3. For specific availability or delivery information on a given package and temperature grade, consult the Fairchild O.E.M. Price List or call the local sales representative or distributor.

TTL

TTL SINGLE AND DUAL FLIP-FLOPS

Item	Function	DEVICE NO.	Inputs	Clock Edge	Direct Set	Direct Clear	Clock Frequency MHz (Typ)	Clock to Output Delay-ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Single JK	**9000**	3J, 3K, JK		X	X	20	16	100	D50	3I, 6A
2	Single JK	**9001**	2J, 2K, J, K, JK		X	X	50	16	115	D51	3I, 6A
3	Single JK	**54H/74H71**	(AOI) (2+2)J, (2+2)K		X	—	30	22	95	D52a	3I, 6A, 9A
4	Single JK	**54H/74H101**	(AOI) (2+2)J, (2+2)K		X	—	50	16	100	D52b	3I, 6A, 9A
5	Single JK	**54/7472**	3J, 3K		X	X	20	25	50	D53a	3I, 6A, 9A
6	Single JK	**54H/74H72**	3J, 3K		X	X	30	22	80	D53a	3I, 6A, 9A
7	Single JK	**54H/74H102**	3J, 3K		X	X	50	16	100	D53b	3I, 6A, 9A
8	Single JK	**54/7470**	2J, 2K, $\overline{J}$, $\overline{K}$		X	X	35	27	65	D54	3I, 6A, 9A
9	Dual D	**54/7474**	D		X	X	25	20	85	D61	3I, 6A, 9A
10	Dual D	**54H/74H74**	D		X	X	43	13	150	D61	3I, 6A, 9A
11	Dual D	**54S/74S74**	D		X	X	100	7.0	150	D61	3I, 6A, 9A
12	Dual D	**54LS/74LS74**	D		X	X	50	15	20	D61	3I, 6A, 9A
13	Dual JK	**9020**	J, K, $\overline{J}$, $\overline{K}$, JK		—	X	50	16	210	D55	4L, 6B
14	Dual JK	**9022**	J, $\overline{K}$, JK		X	X	15	16	210	D56	4L, 6B
15	Dual JK	**54/7473**	J, K		—	X	20	25	100	D57a	3I, 6A, 9A
16	Dual JK	**54/74107**	J, K		—	X	20	25	100	D57a	3I, 6A, 9A
17	Dual JK	**54H/74H73**	J, K		—	X	30	22	160	D57a	3I, 6A, 9A
18	Dual JK	**54H/74H103**	J, K		—	X	50	16	200	D57b	3I, 6A, 9A
19	Dual JK	**54S/74S113**	J, K		X	—	125	5.0	150	D63	3I, 6A, 9A
20	Dual JK	**54LS/74LS113**	J, K		X	—	60	12	20	D63	3I, 6A, 9A
21	Dual JK	**54/7476**	J, K		X	X	20	25	100	D58	4L, 6B, 9B
22	Dual JK	**54H/74H76**	J, K		X	X	30	22	150	D58	4L, 6B, 9B
23	Dual JK	**54H/74H106**	J, K		X	X	50	16	200	D58	4L, 6B, 9B
24	Dual JK	**54S/74S112**	J, K		X	X	125	5.0	150	D62	4L,6B,9B
25	Dual JK	**54LS/74LS112**	J, K		X	X	60	12	20	D62	4L,6B,9B
26	Dual JK	**54H/74H78**	J, K		X	X	30	22	160	D59a	3I,6A,9A
27	Dual JK	**54H/74H108**	J, K		X	X	50	16	200	D59b	3I,6A,9A

TTL

TTL SINGLE AND DUAL FLIP-FLOPS (Cont'd)

Item	Function	DEVICE NO.	Inputs	Clock Edge	Direct Set	Direct Clear	Clock Frequency MHz (Typ)	Clock to Output Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Dual JK	**54S/74S114**	J,K	↓	X	X	125	5.0	150	D64	3I,6A,9A
2	Dual JK	**54LS/74LS114**	J,K	↓	X	X	60	12	20	D64	3I,6A,9A
3	Dual JK	**9024,54/74109**	J,K	↑	X	X	25	22	90	D60	4L,6B,9B
4	Dual JK	**54S/74S109**	J,K	↑	X	X	100	7.0	160	D60	4L,6B,9B
5	Dual JK	**54LS/74LS109**	J,K	↑	X	X	50	15	20	D60	4L,6B,9B
6	Dual JK	**54LS/74LS76**	J,K	↓	X	X	60	12	20	D58	4L,6B,9B
7	Dual JK	**54LS/74LS107**	J,K	↓	—	X	60	12	20	D57a	3I,6A,9A
8	Dual JK	**54LS/74LS78**	J,K	↑	X	X	45	16	20	D82	3I,6A,9A

LATCHES/FLIP-FLOPS

Item	Function	DEVICE NO.	Data Inputs	Common Clear	Enable/Clock Inputs (Level)	Required Enable/Clock Pulse Width-ns (Typ)	Enable/Clock to Q Delay-ns (Typ)	Data to Q Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
9	4-Bit RS Latch	**9314**	4x($\overline{R}_1\overline{S}_1$)	L	1(L)	12	18	18	175	D146	4L,7B,9B
10	4-Bit RS Latch	**93L14**	4x($\overline{R}_1\overline{S}_1$)	L	1(L)	30	51	45	50	D146	4L,7B,9B
11	4-Bit RS Latch	**54/74279**	4x($\overline{R}\overline{S}$)	—	—	—	—	14	90	D147	4L,6B,9B
12	4-Bit RS Latch	**54LS/74LS279**	4x($\overline{R}\overline{S}$)	—	—	—	—	14	19	D147	4L,6B,9B
13	4-Bit D Latch	**9314**	4xD	L	1(L)	12	18	18	175	D146	4L,7B,9B
14	4-Bit D Latch	**93L14**	4xD	L	1(L)	30	51	45	50	D146	4L,7B,9B
15	4-Bit D Latch	**54/7475**	4xD	—	2(H)	20	16	16	160	D148	4L,6B,9B
16	4-Bit D Latch	**5477**	4xD	—	2(H)	20	16	16	160	D149	3I
17	4-Bit D Latch	**54/74196**	4xD	L	1(L)	20	23	20	240	D125	3I,6A,9A
18	4-Bit D Latch	**54LS/74LS196**	4xD	L	1(L)	20	28	24	60	D125	3I,6A,9A
19	4-Bit D Latch	**54/74197**	4xD	L	1(L)	20	23	20	240	D125	3I,6A,9A
20	4-Bit D Latch	**54LS/74LS197**	4xD	L	1(L)	20	28	24	60	D125	3I,6A,9A
21	4-Bit D Latch	**54LS/74LS75**	4xD	—	2(H)	20	10	10	32	D148	4L,6B,9B
22	4-Bit D Latch	**54LS/74LS77**	4xD	—	2(H)	20	10	10	32	D149	4L,6B,9B

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LATCHES/FLIP-FLOPS (Cont'd)

Item	Function[1]	DEVICE NO.	Data Inputs	Common Clear	Enable/Clock Inputs (Level)	Required Enable/Clock Pulse Width-ns (Typ)	Enable/Clock to Q Delay-ns (Typ)	Data to Q Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	4-Bit D Latch	**54LS/74LS375**	4xD	—	2(H)	20	10	10	32	D190	4L,6B,9B
2	4-Bit D Flip-Flop	**54/74175**	4xD	L	1(_⌐)	20	20	—	150	D150	4L,6B,9B
3	4-Bit D Flip-Flop	**54LS/74LS175**	4xD	L	1(_⌐)	20	21	—	55	D150	4L,6B,9B
4	4-Bit D Flip-Flop	**54S/74S175**	4xD	L	1(_⌐)	7.0	10	—	300	D150	4L,6B,9B
5	4-Bit D Flip-Flop	**54/74298**	4x2	—	1(¬_)	20	20	—	195	D156	4L,7B,9B
6	4-Bit D Flip-Flop	**54LS/74LS298**	4x2	—	1(¬_)	20	20	—	65	D156	4L,6B,9B
7	Dual 4-Bit D Latch	**9308**	8xD	2xL	2x2 AND	15	19	12	300	D151	4M,6N,9N
8	Dual 4-Bit D Latch	**93L08**	8xD	2xL	2x2 AND	30	32	32	100	D151	4M,6N,9N
9	Dual 4-Bit D Latch	**54/74116**	8xD	2xL	2x2 AND	15	19	12	300	D151	4M,6N,9N
10	Dual 4-Bit Addr. Latch	**54LS/74LS256**	8xD	X	2(L)	12	20	20	100	D87	4L,6B,9B
11	6-Bit D Flip-Flop	**54/74174**	6	L	1(_⌐)	20	20	—	225	D152	4L,6B,9B
12	6-Bit D Flip-Flop	**54S/74S174**	6	L	1(_⌐)	7.0	10	—	450	D152	4L,6B,9B
13	6-Bit D Flip-Flop	**54LS/74LS174**	6	L	1(_⌐)	20	21	—	80	D152	4L,6B,9B
14	8-Bit D Flip-Flop (3S)	**54LS[2]/74LS374**	8xD	—	1(_⌐)	10	23	23	135	D86	9Z
15	8-Bit D Latch	**54LS[2]/74LS373**	8xD	—	1(H)	15	24	16	120	D85	9Z
16	8-Bit D Latch	**54LS[2]/74LS573**	8xD	—	1(L)	—	—	—	—	D179	9Z
17	8-Bit Addr Latch	**9334**	1xD	L	1(L) 3 addr bits	11	18	28	280	D134	4L,7B,9B
18	8-Bit Addr Latch	**93L34**	1xD	L	1(L) 3 addr bits	18	30	37	70	D134	4L,6B,9B
19	8-Bit Addr Latch	**54LS/74LS259**	1xD	L	1(L) 3 addr bits	11	18	28	70	D134	4L,6B,9B
20	8-Bit Multi Port Reg	**9338**	1xD	—	1(L) 9 addr bits	7.0	24	35	425	D153	4L,7B,9B
21	8-Bit Multi Port Reg	**93L38**	1xD	—	1(L) 9 addr bits	19	38	52	105	D153	4L,7B,9B
22	4x4 Register File	**54/74170**	4xD	—	2	25	—	25	635	D154	4L,7B,9B
23	4x4 Register File	**54LS/74LS170**	4xD	—	2	25	—	26	125	D154	4L,7B,9B
24	4x4 Register File (3S)	**54LS/74LS670**	4xD	—	2	25	—	24	150	D154	4L,7B,9B

1. 3S = 3-state 2. To be announced

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MULTIPLEXERS

Item	Function	DEVICE NO.	Enable Inputs	True Output (1)	Complement Output (1)	Select Delay ns (Typ)	Enable Delay ns (Typ)	Data Delay ns (Typ)	Power Dissipation mW (Typ)	Fan-Out (UL) (2)	Logic/Connection Diagram	Package(s)
1	Quad 2-Input	**9322**	1	X	—	18	14	9.0	150	10	D157	4L,7B,9B
2	Quad 2-Input	**93L22**	1	X	—	23	20	14	45	5.0	D157	4L,7B,9B
3	Quad 2-Input	**54/74157**	1	X	—	18	14	9.0	150	10	D157	4L,7B,9B
4	Quad 2-Input	**54LS/74LS157**	1	X	—	18	14	9.0	49	5.0	D157	4L,6B,9B
5	Quad 2-Input	**54S/74S157**	1	X	—	10	8.0	5.0	250	12.5	D157	4L,6B,9B
6	Quad 2-Input	**54LS/74LS158**	1	—	X	16	12	7.0	24	5.0	D157	4L,6B,9B
7	Quad 2-Input	**54S/74S158**	1	—	X	8.0	7.0	4.0	195	12.5	D157	4L,6B,9B
8	Quad 2-Input	**54LS/74LS257**	1	3S	—	14	16	12	50	5.0	D157	4L,6B,9B
9	Quad 2-Input	**54S/74S257**	1	3S	—	10	13	5.0	320	12.5	D157	4L,6B,9B
10	Quad 2-Input	**54LS/74LS258**	1	—	3S	12	16	10	35	5.0	D157	4L,6B,9B
11	Quad 2-Input	**54S/74S258**	1	—	3S	8.0	13	4.0	280	12.5	D157	4L,6B,9B
12	Quad 2-Input	**54/74298**	Clocked (edge-trigger)	X Latched	—	—	20	—	195	10	D156	4L,7B,9B
13	Quad 2-Input	**54LS/74LS298**	Clocked (edge-trigger)	X Latched	—	—	20	—	65	5.0	D156	4L,6B,9B
14	Dual 4-Input	**9309**	—	X	X	15	—	10	150	10	D155	4L,6B,9B
15	Dual 4-Input	**93L09**	—	X	X	45	—	30	38	5.0	D155	4L,6B,9B
16	Dual 4-Input	**54/74153**	2	X	—	22	19	15	180	10	D158	4L,6B,9B
17	Dual 4-Input	**54LS/74LS153**	2	X	—	18	16	10	31	5.0	D158	4L,6B,9B
18	Dual 4-Input	**54S/74S153**	2	X	—	12	10	6.0	225	12.5	D158	4L,6B,9B
19	Dual 4-Input	**54LS/74LS253**	2	3S	—	18	16	10	43	5.0	D158	4L,6B,9B
20	Dual 4-Input	**54S/74S253**	2	3S	—	12	13	6.0	325	12.5	D158	4L,6B,9B
21	Dual 4-Input	**54LS/74LS352**	2	—	X	17	15	8.0	31	5.0	D180	4L,6B,9B
22	Dual 4-Input	**54LS/74LS353**	2	3S	3S	20	12	10	42	5.0	D181	4L,6B,9B
23	8-Input	**9312**	1	X	X	18	15	10	135	10	D159	4L,7B,9B
24	8-Input	**93L12**	1	X	X	54	45	30	36	5.0	D159	4L,7B,9B
25	8-Input	**93S12**	1	X	X	12	10	7.0	190	12.5	D159	4L,7B,9B
26	8-Input	**9313**	1	X	OC	25	22	18	135	10	D159	4L,7B,9B

1. OC = open collector, 3S = 3-state
2. Unit Load (UL) = 40 μA HIGH/1.6 mA LOW

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MULTIPLEXERS (Cont'd)

Item	Function	DEVICE NO.	Enable Inputs	True Output (1)	Complement Output (1)	Select Delay ns (Typ)	Enable Delay ns (Typ)	Data Delay ns (Typ)	Power Dissipation mW (Typ)	Fan-Out (UL) (2)	Logic/Connection Diagram	Packages(s)
1	8-Input	**54/74151A**	1	X	X	25	21	16	145	10	D160	4L,7B,9B
2	8-Input	**54LS/74LS151**	1	X	X	28	25	18	30	5.0	D160	4L,6B,9B
3	8-Input	**54S/74S151**	1	X	X	12	11	8.0	225	12.5	D160	4L,6B,9B
4	8-Input	**54LS/74LS251**	1	3S	3S	29	21	18	33	5.0	D160	4L,6B,9B
5	8-Input	**54S/74S251**	1	3S	3S	12	12	8.0	275	12.5	D160	4L,6B,9B
6	8-Input	**74152A**	1	—	X	18	—	8.0	130	10	D161	7A,9A
7	8-Input	**54LS/74LS152**	—	—	X	22	—	11	28	5.0	D161	4L,6B,9B
8	16-Input	**54/74150**	1	—	X	22	21	13	200	10	D162	4M,6N,9N

DECODERS/DEMULTIPLEXERS

Item	Function	DEVICE NO.	Address Inputs	Active LOW Enable	Active LOW Outputs	Open Collector Output Voltage V	Address Delay ns (Typ)	Enable Delay ns (Typ)	Power Dissipation mW (Typ)	Fan-Out (UL) (2)	Logic/Connection Diagram	Package(s)
9	Dual 1-of-4	**9321**	2+2	1+1	4+4	—	14	12	150	10	D131	4L,6B,9B
10	Dual 1-of-4	**93L21**	2+2	1+1	4+4	—	43	34	45	5.0	D131	4L,6B,9B
11	Dual 1-of-4	**54LS/74LS139**	2+2	1+1	4+4	—	22	19	34	5.0	D131	4L,6B,9B
12	Dual 1-of-4	**54S/74S139**	2+2	1+1	4+4	—	7.5	6.0	300	12.5	D131	4L,6B,9B
13	Dual 1-of-4	**54/74155**	2	2+2	4+4	—	21	18	125	10	D132	4L,6B,9B
14	Dual 1-of-4	**54LS/74LS155**	2	2+2	4+4	—	18	15	30	5.0	D132	4L,6B,9B
15	Dual 1-of-4	**54/74156**	2	2+2	4+4	5.5	23	20	125	10	D132	4L,6B,9B
16	Dual 1-of-4	**54LS/74LS156**	2	2+2	4+4	5.5	33	26	31	5.0	D132	4L,6B,9B
17	1-of-8	**9301**	3	1	8	—	22	22	145	10	D133	4L,6B,9B
18	1-of-8	**93L01**	3	1	8	—	36	36	45	5.0	D133	4L,6B,9B
19	1-of-8	**9302**	3	1	8	5.5	30	30	145	10	D133	4L,6B,9B
20	1-of-8	**9334**	3	1	8	—	30	19	280	6.0	D134	4L,7B,9B

1. OC = open collector, 3S = 3-state
2. Unit Load (UL) = 40μA HIGH/1.6mA LOW

TTL

DECODERS/DEMULTIPLIPLEXERS (Cont'd)

Item	Function	DEVICE NO.	Address Inputs	Active LOW Enable	Active LOW Outputs	Open Collector Output Voltage V	Address Delay ns (Typ)	Enable Delay ns (Typ)	Power Dissipation mW (Typ)	Fan-Out (UL)*	Logic/Connection Diagram	Package(s)
1	1-of-8	**93L34**	3	1	8	—	46	30	70	5.0	D134	4L,7B,9B
2	1-of-8	**54LS/74LS259**	3	1	8	—	30	19	60	5.0	D134	4L,6B,9B
3	1-of-8	**54/7445**	3	1	8	30	40	40	215	80mA	D135	4L,7B,9B
4	1-of-8	**54/7442**	3	1	8	—	26	26	140	10	D135	4L,6B,9B
5	1-of-8	**54LS/74LS42**	3	1	8	—	17	17	35	5.0	D135	4L,6B,9B
6	1-of-8	**54LS/74LS138**	3	3	8	—	22	21	34	5.0	D136	4L,6B,9B
7	1-of-8	**54S/74S138**	3	3	8	—	8.0	7.0	225	12.5	D136	4L,6B,9B
8	1-of-8	**54/74145**	3	1	8	15	40	40	215	80mA	D135	4L,7B,9B
9	1-of-8 w/ Input Latches	**93S137**	3	2	8	—	14	8.0	310	12.5	D137	4L,6B,9B
10	1-of-10	**9301**	4 (BCD)	—	10	—	22	—	145	10	D133	4L,7B,9B
11	1-of-10	**93L01**	4 (BCD)	—	10	—	36	—	45	5.0	D133	4L,7B,9B
12	1-of-10	**9302**	4 (BCD)	—	10	5.5	30	—	145	10	D133	4L,7B,9B
13	1-of-10	**54/7445**	4 (BCD)	—	10	30	40	—	215	80mA	D135	4L,7B,9B
14	1-of-10	**54/7442**	4 (BCD)	—	10	—	26	—	140	10	D135	4L,6B,9B
15	1-of-10	**54LS/74LS42**	4 (BCD)	—	10	—	17	—	35	5.0	D135	4L,6B,9B
16	1-of-10	**54/7443**	4 Excess-3	—	10	—	26	—	140	10	D135	4L,6B,9B
17	1-of-10	**54/7444**	4 Excess-3 (Gray)	—	10	—	26	—	140	10	D135	4L,6B,9B
18	1-of-10	**54/74145**	4 (BCD)	—	10	15	40	—	215	80mA	D135	4L,7B,9B
9	1-of-16	**9311**	4	2	16	—	21	17	175	10	D138	4M,6N,9N
20	1-of-16	**93L11**	4	2	16	—	70	48	58	5.0	D138	4M,6N,9N
21	1-of-16	**54/74154**	4	2	16	—	22	19	180	10	D138	4M,6N,9N
22	1-of-10 Sequential (Decade Sequencer)	**9319**		Clock	10			25	300	10	D139	4L,7B,9B
23	1-of-10 Sequential (Decade Sequencer)	**9320**		Clock	10	3K Pull-up		25	310	10	D139	4L,7B,9B

*Unit Load (UL) = 40μA HIGH/1.6mA LOW

TTL

REGISTERS

Item	Function	DEVICE NO.	No. of Bits	Serial Entry	Parallel Entry No. of Bits *	Clock Edge	Max Clock Freq MHz (Typ)	Clock to Output Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Parallel-in/Parallel-out Shift Right	**9300**	4	$J,\overline{K}$	4S	↑	38	16	300	D163	4L,7B,9B
2	Parallel-in/Parallel-out Shift Right	**93H00**	4	$J,\overline{K}$	4S	↑	55	12	325	D163	4L,7B,9B
3	Parallel-in/Parallel-out Shift Right	**93L00**	4	$J,\overline{K}$	4S	↑	17	28	75	D163	4L,7B,9B
4	Parallel-in/Parallel-out Shift Right	**93S00**	4	$J,\overline{K}$	4S	↑	105	10	350	D163	4L,7B,9B
5	Parallel-in/Parallel-out Shift Right	**93H72**	4	D	4S	↑	60	12	475	D164	4L,7B,9B
6	Parallel-in/Parallel-out Shift Right	**54/7494**	4	D	4S	↑	20	25	175	D165	4L,7B,9B
7	Parallel-in/Parallel-out Shift Right	**54/7495**	4	D	4S	↓	36	20	195	D166	3I,7A,9A
8	Parallel-in/Parallel-out Shift Right	**54LS/74LS95**	4	D	4S	↓	36	20	65	D166	3I,6A,9A
9	Parallel-in/Parallel-out Shift Right	**54/7496**	5	D	5A	↑	10	25	240	D167	4L,7B,9B
10	Parallel-in/Parallel-out Shift Right	**54/74178**	4	D	4A	↓	39	23	230	D168	3I,7A,9A
11	Parallel-in/Parallel-out Shift Right	**54/74179**	4	D	4A	↓	39	23	230	D169	4L,7B,9B
12	Parallel-in/Parallel-out Shift Right	**54/74195**	4	$J,\overline{K}$	4S	↑	39	17	195	D163	4L,7B,9B
13	Parallel-in/Parallel-out Shift Right	**54LS/74LS195**	4	$J,\overline{K}$	4S	↑	39	17	70	D163	4L,6B,9B
14	Parallel-in/Parallel-out Shift Right	**54/74199**	8	$J,\overline{K}$	8S	↑	35	20	360	D170	4M,6N,9N
15	Parallel-in/Parallel-out Shift Right	**54LS/74LS295**	4	D	4S	↑	28	40	75	D171	3I,6A,9A
16	Parallel-in/Parallel-out Bi-Directional	**54/74194**	4	DR, DL	4S	↑	36	16	195	D172	4L,7B,9B
17	Parallel-in/Parallel-out Bi-Directional	**54S/74S194**	4	DR, DL	4S	↑	105	10	425	D172	4L,7B,9B

*A = asynchronous, S = synchronous

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REGISTERS (Cont'd)

Item	Function	DEVICE NO.	No. of Bits	Serial Entry	Parallel Entry No. of Bits[1]	Clock Edge	Max Clock Freq MHz (Typ)	Clock to Output Delay-ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Parallel-in/Parallel-out Bi-Directional	**54LS/74LS194**	4	DR, DL	4S	↑	36	16	75	D172	4L,6B,9B
2	Parallel-in/Parallel-out Bi-Directional	**54/74198**	8	DR, DL	8S	↑	35	19	360	D173	4M,6N,9N
3	Parallel-in/Parallel-out Bi-Directional	**54LS[2]/74LS299**	8	D	4S	↑	40	15	175	D88	9Z
4	Parallel-in/Parallel-out Bi-Directional	**54LS[2]/74LS323**	8	D	8S	↑	40	15	175	D89	9Z
5	Serial-in/Parallel-out	**54/74164**	8	2D	—	↑	36	19	185	D174	3I,7A,9A
6	Serial-in/Parallel-out	**54LS/74LS164**	8	2D	—	↑	18	50	95	D174	3I,6A,9A
7	Parallel-in/Parallel-out	**54/74174**	6	—	6S	↑	35	21	230	D152	4L,7B,9B
8	Parallel-in/Parallel-out	**54S/74S174**	6	—	6S	↑	110	11	450	D152	4L,7B,9B
9	Parallel-in/Parallel-out	**54LS/74LS174**	6	—	6S	↑	40	21	65	D152	4L,6B,9B
10	Parallel-in/Parallel-out	**54/74175**	4	—	4S	↑	35	21	150	D150	4L,7B,9B
11	Parallel-in/Parallel-out	**54S/74S175**	4	—	4S	↑	110	11	300	D150	4L,7B,9B
12	Parallel-in/Parallel-out	**54LS/74LS175**	4	—	4S	↑	40	21	45	D150	4L,6B,9B
13	Parallel-in/Parallel-out	**54/74298**	4	—	2D Mux	↓	30	21	195	D156	4L,7B,9B
14	Parallel-in/Parallel-out	**54LS/74LS298**	4	—	2D Mux	↓	30	21	65	D156	4L,6B,9B
15	Parallel-in/Parallel-out	**54LS[2]/74LS395**	4	D	4S	↑	35	21	75	D196	4L,7B,9B
16	Parallel-in/Parallel-out	**54LS[2]/74LS273**	8	—	8S	↑	45	18	85	D90	9Z
17	Parallel-in/Parallel-out	**54LS[2]/74LS374**	8	—	8S	↑	55	20	135	D86	9Z
18	Parallel-in/Parallel-out	**54LS[2]/74LS377**	8	—	8S	↑	45	18	85	D91	9Z
19	Parallel-in/Parallel-out	**54LS/74LS378**	6	—	6S	↑	45	20	65	D92	4L,6B,9B
20	Parallel-in/Parallel-out	**54LS/74LS379**	4	—	4S	↑	45	15	75	D93	4L,6B,9B
21	Parallel-in/Parallel-out	**54LS[2]/74LS398**	4	—	2D Mux	↑	35	20	37	D95	9Z

1. A = asynchronous, S = synchronous
2. To be announced

TTL

REGISTERS (Cont'd)

Item	Function	DEVICE NO.	No. of Bits	Serial Entry	Parallel Entry No. of Bits[1]	Clock Edge	Max Clock Freq MHz (Typ)	Clock to Output Delay-ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Parallel-in/Parallel-out	**54LS/74LS399**	4	—	2D Mux	↑	35	20	37	D96	4L,6B,9B
2	Parallel-in/Parallel-out	**54LS[3]/74LS574**	8	—	8S	↑	55	20	135	D97	9Z
3	Parallel-in/Serial-out	**54/7494**	4	D	4S	↑	10	25	175	D165	4L,7B,9B
4	Parallel-in/Serial-out	**54/74165**	8	D	8A	↑	26	19	210	D175	4L,7B,9B
5	Parallel-in/Serial-out	**54/74166**	8	D	8S	↑	35	20	360	D176	4L,7B,9B
6	Parallel-in/Serial-out	**54LS/74LS165**	8	D	8A	↑	40	19	105	D175	4L,7B,9B
7	Parallel-in/Parallel-out Shift Right	**54LS/74LS95B**	4	D	4S	↑	35	20	65	D166	3I,6A,9A
8	Parallel-in/Parallel-out Shift Right	**54LS/74LS195**	4	J,K	4S	↑	39	17	70	D163	4L,6B,9B
9	Parallel-in/Parallel-out Shift Right	**54LS/74LS295A**	4	D	4S	↑	28	40	75	D171	3I,6A,9A
10	Serial-in/Serial-out	**9328**	16	2x2D Mux	—	↑	30	17	300	D177	4L,7B,9B
11	Serial-in/Serial-out	**93L28**	16	2x2D Mux	—	↓	15	42	80	D177	4L,7B,9B
12	Serial-in/Serial-out	**54/7491**	8	2D	—	↓	18	25	175	D178	3I,7A,9A
13	Multiport Registers	**9338**	8	D	—	↓	25	23	425	D153	4L,7B,9B
14	Multiport Registers	**93L38**	8	D	—	↑	20	38	105	D153	4L,7B,9B
15	Multiport Registers	**54/74170**	16	—	4A	↓	—	25	635	D154	4L,7B,9B
16	Multiport Registers	**54LS/74LS170**	16	—	4A	↑	—	25	125	D154	4L,7B,9B
17	Multiport Registers	**54LS/74LS670**	16	—	4A	↑	—	30	150	D154	4L,7B,9B
18	Quad D (3S)[2]	**54/74173**	4	—	4S	↑	35	28	250	D189	4L,7B,9B
19	Quad D (3S)[2]	**54LS/74LS173**	4	—	4S	↑	30	18	35	D189	4L,7B,9B
20	Successive Approx Register	**54LS/74LS502**	8	D	—	↑	25	18	325	D98	4I,6B,9B

1. A = asynchronous, S = synchronous
2. 3S = 3-state
3. To be announced

TTL

COUNTERS

Item	Function	DEVICE NO.	Modulo	Parallel Load*	Clock Transition	Max Clock Rate MHz (Typ)	Clock to Q Output Delay-ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Asynchronous	**54/74290**	2x5	—	↓	40	33	160	D120	3I,6A,9A
2	Asynchronous	**54/7490A**	2x5	—	↓	40	33	160	D121	3I,6A,9A
3	Asynchronous	**54LS/74LS90**	2x5	—	↓	50	33	45	D121	3I,6A,9A
4	Asynchronous	**54/7492**	2x6	—	↓	40	33	160	D122	3I,6A,9A
5	Asynchronous	**74LS92**	2x6	—	↓	50	40	45	D122	6A,9A
6	Asynchronous	**54/74293**	2x8	—	↓	40	46	160	D123	3I,6A,9A
7	Asynchronous	**54/7493A**	2x8	—	↓	40	46	160	D124	3I,6A,9A
8	Asynchronous	**54LS/74LS93**	2x8	—	↓	50	46	45	D124	3I,6A,9A
9	Asynchronous	**54/74176**	2x5	A	↓	50	34	150	D125	3I,6A,9A
10	Asynchronous	**54/74177**	2x8	A	↓	50	50	150	D125	3I,6A,9A
11	Asynchronous	**54/74196**	2x5	A	↓	70	38	240	D125	3I,6A,9A
12	Asynchronous	**54LS/74LS196**	2x5	A	↓	60	48	60	D125	3I,6A,9A
13	Asynchronous	**54/74197**	2x8	A	↓	70	52	240	D125	3I,6A,9A
14	Asynchronous	**54LS/74LS197**	2x8	A	↓	70	60	60	D125	3I,6A,9A
15	Asynchronous	**54LS/74LS290**	2x5	—	↓	42	12	45	D120	3I,6A,9A
16	Asynchronous	**54LS/74LS293**	2x8	—	↓	42	12	45	D123	3I,6A,9A
17	Asynchronous	**54LS/74LS390**	2x5	—	↓	60	36	64	D194	4L,6B,9B
18	Asynchronous	**54LS/74LS393**	2x8	—	↓	60	36	64	D195	4L,6B,9B
19	Asynchronous	**54LS/74LS490**	2x5	—	↓	50	6.0	100	D84	4L,6B,9B
20	Variable Modulo	**9305**	2x5,6,7,8	—	↑	26	44	210	D126	3I,7A,9A
21	Variable Modulo	**93S05**	2x5,6,7,8	—	↑	100	20	300	D126	3I,7A,9A
22	Synchronous	**9310**	10 Presettable	S	↑	45	15	325	D127	4L,7B,9B
23	Synchronous	**93L10**	10 Presettable	S	↑	23	26	85	D127	4L,7B,9B
24	Synchronous	**93S10**	10 Presettable	S	↑	90	9.0	410	D127	4L,7B,9B
25	Synchronous	**9316**	16 Presettable	S	↑	45	15	325	D127	4L,7B,9B

*A = asynchronous, S = synchronous

TTL

COUNTERS (Cont'd)

Item	Function	DEVICE NO.	Modulo	Parallel Load*	Clock Transition	Max Clock Rate MHz (Typ)	Clock to Q Output Delay-ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Synchronous	**93L16**	16 Presettable	S	↑	23	26	85	D127	4L,7B,9B
2	Synchronous	**93S16**	16 Presettable	S	↑	90	9.0	410	D127	4L,7B,9B
3	Synchronous	**54/74160**	10 Presettable	S	↑	32	17	315	D127	4L,7B,9B
4	Synchronous	**54LS/74LS160**	10 Presettable	S	↑	45	15	95	D127	4L,7B,9B
5	Synchronous	**54/74161**	16 Presettable	S	↑	32	17	315	D127	4L,7B,9B
6	Synchronous	**54LS/74LS161**	16 Presettable	S	↑	45	15	95	D127	4L,7B,9B
7	Synchronous	**54/74162**	10 Presettable	S	↑	32	17	315	D128	4L,7B,9B
8	Synchronous	**54LS/74LS162**	10 Presettable	S	↑	45	15	95	D128	4L,7B,9B
9	Synchronous	**54/74163**	16 Presettable	S	↑	32	17	315	D128	4L,7B,9B
10	Synchronous	**54LS/74LS163**	16 Presettable	S	↑	45	15	95	D128	4L,7B,9B
11	Up/Down	**54LS/74LS168**	10 Presettable	—	↑	32	15	100	D83	4L,6B,9B
12	Up/Down	**54LS/74LS169**	16 Presettable	—	↑	32	15	100	D83	4L,6B,9B
13	Up/Down	**54/74192**	10	A	↑	30	30	325	D129	4L,7B,9B
14	Up/Down	**54LS/74LS192**	10	A	↑	40	30	85	D129	4L,7B,9B
15	Up/Down	**54/74193**	16	A	↑	30	30	325	D129	4L,7B,9B
16	Up/Down	**54LS/74LS193**	16	A	↑	40	30	85	D129	4L,7B,9B
17	Up/Down	**54/74190**	10	A	↑	25	20	325	D130	4L,7B,9B
18	Up/Down	**74LS190**	10	A	↑	40	20	90	D130	7B,9B
19	Up/Down	**54/74191**	16	A	↑	25	20	325	D130	4L,7B,9B
20	Up/Down	**74LS191**	16	A	↑	40	20	90	D130	7B,9B

*A = asynchronous, S = synchronous

TTL

COUNTERS (Cont'd)

Item	Function	DEVICE NO.	Modulo	Parallel Load[1]	Clock Transition	Max Clock Rate MHz (Typ)	Clock to Q Output Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Up/Down	**54LS[2]/74LS568**	10 Presettable	S	_|‾	—	—	—	D99	9Z
2	Up/Down	**54LS[2]/74LS569**	16 Presettable	S	_|‾	—	—	—	D99	9Z
3	Rate Multiplier	**54/7497**	M.f./64	—	_|‾	32	20	400	D187	4L,7B,9B
4	Rate Multiplier	**54/74167**	M.f./10	—	_|‾	32	20	325	D188	4L,7B,9B

MONOSTABLES (ONE-SHOTS)

Item	Function	DEVICE NO.	Pulse Width Variation (%)		No. of Inputs		Resettable	Min Output (tw) ns	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
			vs. Temp	vs. VCC	Positive	Negative					
5	Single Retriggerable	**9600**	±1.5	±1.5	3	2	X	75	125	D40	3I,6A
6	Single Retriggerable	**9601**	±2.7	±1.0	2	2	—	50	125	D41	3I,6A,9A
7	Dual Retriggerable	**9602**	±1.5	±1.5	1	1	X	72	250	D42	4L,6B,9B
8	Dual Retriggerable	**96L02**	±0.4	±1.5	1	1	X	110	50	D42	4L,6B,9B
9	Dual Retriggerable	**96S02**	±0.2	±0.2	1	1	X	27	250	D42	4L,6B,9B
10	Single Non-Retriggerable	**9603,54/74121**	±0.2	±0.15	1	2	—	40	90	D43	3I,6A,9A
11	Single Retriggerable	**54/74122**	±2.7	±1.0	2	2	X	45	115	D44	3I,6A,9A
12	Dual Retriggerable	**54/74123**	±2.7	±1.0	1	1	X	45	230	D45	4L,6B,9B
13	Dual Retriggerable	**96LS02**	±0.5	±0.7	1	1	X	35	175	D42	4L,6B,9B

1. A = asynchronous, S = synchronous
2. To be announced

TTL

LINE AND BUS DRIVERS

Item	Function[1]	DEVICE NO.	Companion Receiver	Supply Voltages V	V_{OH} V	V_{OL} V	t_{pd} ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Quad 2 NAND Driver	**54/7437**	Any TTL	5.0	2.4	0.4	10	108	D2	3I,6A,9A
2	Quad 2 NAND Driver	**54/7438**	96106	5.0	5.5	0.4	13	98	D2	3I,6A,9A
3	Quad 2 NAND Driver (OC)	**96101**	96106	5.0	5.5	0.6	13	98	D3	3I,6A,9A
4	Dual 2 NAND Driver	**9009**	Any TTL	5.0	2.4	0.4	10	54	D5	3I,6A
5	Dual 2 NAND Driver	**54/7440**	Any TTL	5.0	2.4	0.4	11	52	D5	3I,6A,9A
6	Dual 2 NAND Driver	**54H/74H40**	Any TTL	5.0	2.4	0.4	7.0	88	D5	3I,6A,9A
7	Dual 2 NAND Driver	**54S/ 74S40**	Any TTL	5.0	2.7	0.5	4.0	88	D5	3I,6A,9A
8	Dual 2 NAND 50Ω Driver	**54S/ 74S140**	Any TTL	5.0	2.0	0.5	4.0	88	D5	3I,6A,9A
9	Quad Inverting Bus Transceiver	**54LS/ 74LS242**	Any TTL	5.0	2.4	0.4	12	175	D75	3I,6A,9A
10	Quad Non-inverting Bus Transceiver	**54LS/ 74LS243**	Any TTL	5.0	2.4	0.4	12	180	D76	3I,6A,9A
11	Octal Inverting Bus Driver (3S)	**54LS[2]/ 74LS240**	Any TTL	5.0	2.4	0.4	12	175	D73	9Z
12	Octal Non-inverting Bus Driver (3S)	**54LS[2]/ 74LS241**	Any TTL	5.0	2.4	0.4	12	180	D74	9Z
13	Octal Non-inverting Bus Driver (3S)	**54LS[2]/ 74LS244**	Any TTL	5.0	2.4	0.4	12	180	D77	9Z
14	Octal Bus Transceiver	**54LS[2]/ 74LS245**	Any TTL	5.0	2.4	0.4	12	375	D78	9Z
15	Octal Inverting Bus Transceiver	**54LS[2]/ 74LS540**	Any TTL	5.0	2.4	0.4	12	175	D80	9Z
16	Octal Non-inverting Bus Transceiver	**54LS[2]/ 74LS541**	Any TTL	5.0	2.4	0.4	12	180	D81	9Z

1. OC = open collector, 3S = 3-state
2. To be announced

TTL

DISPLAY DECODER/DRIVERS

Item	Function*	DEVICE NO.	Output Current mA	Output Voltage V	Active HIGH/LOW	Ripple Blanking	Blanking Above BCD 9-Input	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	1-of-10 Cold Cathode	**54/7441**	7.0	55	L	—	—	145	D140	4L,6B,9B
2	1-of-10-Cold Cathode	**54/74141**	7.0	55	L	—	X	80	D140	4L,7B,9B
3	1-of-10 Driver (OC)	**9302**	16	5.5	L	—	X	145	D133	4L,6B,9B
4	1-of-10 Driver (OC)	**54/7445**	80	30	L	—	X	215	D135	4L,7B,9B
5	1-of-10 Driver (OC)	**54/74145**	80	15	L	—	X	215	D135	4L,7B,9B
6	7-Seg Decoder	**9307**	11	5.5	H	X	—	165	D141	4L,7B,9B
7	7-Seg Decoder	**54/7448**	8.0	5.5	H	X	—	265	D141	4L,7B,9B
8	7-Seg Decoder	**5449**	9.6	5.5	H	X	—	165	D142	3I
9	1-of-10 Cold Cathode	**9315**	7.0	55	L	—	—	145	D140	4L,6B,9B
10	7-Seg Decoder/Driver	**9317B**	40	20	L	X	X	220	D143	4L,7B,9B
11	7-Seg Decoder/Driver	**9317C**	20	30	L	X	X	220	D143	4L,7B,9B
12	7-Seg Decoder/Driver	**54/7446**	40	30	L	X	—	320	D143	4L,7B,9B
13	7-Seg Decoder/Driver	**54/7447**	40	15	L	X	—	320	D143	4L,7B,9B
14	7-Seg Decoder/Driver	**54LS/74LS47**	12	15	L	X	—	35	D143	4L,6B,9B
15	7-Seg Decoder/Driver	**54LS/74LS48**	1.3	5.5	H	X	—	125	D141	4L,6B,9B
16	7-Seg Decoder/Driver	**54LS/74LS49**	1.3	5.5	H	X	—	40	D142	3I,6A,9A
17	7-Seg Decoder/Driver	**54LS/74LS247**	12	15	L	X	—	30	D143	4L,6B,9B
18	7-Seg Decoder/Driver	**54LS/74LS248**	1.3	5.5	H	X	—	125	D141	4L,6B,9B
19	7-Seg Decoder/Driver	**54LS/74LS249**	1.3	5.5	H	X	—	40	D141	4L,6B,9B
20	7-Seg LED Driver Common Cathode	**9368**	20	1.7	H	X	—	225	D144	6B,9B
21	7-Seg LED Driver Common Anode (OC)	**9370**	25	5.5	L	X	—	350	D145	6B,9B
22	7-Seg LED Driver Common Anode	**9374**	15	10	L	X	—	175	D145	6B,9B

*OC = open collector

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TTL

ARITHMETIC OPERATORS

Item	Function	DEVICE NO.	Description*	No. of Bits	t_{pd} ns	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Adder	**54/7480**	Gated 1-Bit with Carry	1	47	105	D100	3I,6A,9A
2	Adder	**9304**	Dual 1-Bit with Carry	2	26	150	D101	3I,6A,9A
3	Adder	**93H183** **54H/74H183**	Dual 1-Bit with Carry	2	12	250	D102	3I,6A,9A
4	Adder	**54/7482**	Full2-Bit with Carry	2	38	176	D103	3I,6A,9A
5	Adder	**54/7483A**	Full Binary 4-Bit w/Carry	4	16	330	D104	4L,6B,9B
6	Adder	**54LS/74LS83**	Full Binary 4-Bit w/Carry	4	15	95	D104	4L,6B,9B
7	Adder	**54/74283**	Full Binary 4-Bit w/Carry	4	16	330	D105	4L,6B,9B
8	Adder	**54LS/74LS283**	Full Binary 4-Bit w/Carry	4	15	95	D105	4L,6B,9B
9	Arithmetic Logic Unit	**9340**	ALU with Internal CLA	4	24	400	D106	4M,6N,9N
10	Arithmetic Logic Unit	**54/74181**	ALU with External CLA	4	27	450	D107	4M,6N,9N
11	Arithmetic Logic Unit	**93L41**	ALU with External CLA	4	35	120	D107	4M,6N,9N
12	Arithmetic Logic Unit	**74LS181**	ALU with External CLA	4	20	105	D107	6N,9N
13	Arithmetic Logic Unit	**93S41**	ALU with External CLA	4	12	500	D107	4M,6N,9N
14	Carry Lookahead	**54/74182**	CLA generator for 9341	—	12	180	D108	4L,6B,9B
15	Carry Lookahead	**54S/74S182**	CLA generator for 93S41/9405	—	7.0	260	D108	4L,6B,9B
16	Carry Lookahead	**54LS/74LS182**	CLA for 74LS181	4	20	60	D108	4L,6B,9B
17	Comparator	**9386 (8242)**	4-Bit Ident Excl NOR	4	18	170	D24	3I,6A,9A
18	Comparator	**54/7485**	4-Bit Magnitude w/Exp	4	21	275	D109	4L,7B,9B
19	Comparator	**54LS/74LS85**	4-Bit Magnitude w/Exp	4	21	52	D109	4L,7B,9B
20	Comparator	**9324**	5-Bit Magnitude	5	20	210	D110	4L,7B,9B
21	Comparator	**93L24**	5-Bit Magnitude	5	55	55	D110	4L,7B,9B
22	Comparator	**93S46**	6-Bit Identity w/Exp	6	9.0	225	D111	4L,6B,9B
23	Comparator	**93S47**	6-Bit Identity (OC)	6	10	175	D112	4L,6B,9B
24	Encoder	**9318**	Priority 8-Bit w/Exp	8	13	250	D113	4L,6B,9B
25	Encoder	**93L18**	Priority 8-Bit w/Exp	8	24	75	D113	4L,6B,9B

* CLA = carry lookahead, OC = open collector

TTL

ARITHMETIC OPERATORS (Cont'd)

Item	Function	DEVICE NO.	Description	No. of Bits	t_{pd} ns	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Multiplier	**9344**	Binary 4x2-Bit	4x2	30	550	D114	4M,6N,9N
2	Multiplier	**93S43**	2s Complement	4x2	20	490	D115	4M,6N,9N
3	Parity Generator/Check	**54/74180**	8-Bit Parity Gen/Check	8	40	170	D116	3I,6A,9A
4	Parity Generator/Check	**93S62**	9-Bit Parity Gen/Check	9	20	225	D117	3I,6A,9A
5	Parity Generator/Check	**9348**	12-Bit Parity Gen/Check	12	40	235	D118	4L,6B,9B
6	True/Complement	**54H/74H87**	4-Bit True/Complement Zero/One Element	4	14	270	D119	3I,6A,9A
7	True/Complement	**54S/74S135**	Dual 2-Bit Exclusive OR/NOR	4	9	325	D23	4L,6B,9B

ECL

SSI FUNCTIONS

Item	Function	DEVICE NO.*	t_{pd} ns (Typ)	Power Dissipation mW (Typ)	Logic/ Connection Diagram	Package(s)
OR Gates						
8	Dual 3/3 OR	**95110**	2.5	145	E81	6B
9	Dual 3/3 OR	**10110/10510**	2.4	145	E81	4L,6B,9B
10	Dual 3/3 OR	**10210/10610**	1.5	160	E81	4L,6B
11	Quad OR	**95103**	2.0	100	E76	6B
12	Quad OR	**10103/10503**	2.0	100	E76	4L,6B,9B
13	Quad Exc OR	**10113/10513**	3.0	170	E84	4L,6B,9B
Quad AND Gates						
14	Quad AND	**10104/10504**	2.4	145	E83	4L,6B,9B
NOR Gates						
15	Dual 3/3 NOR	**95111**	2.5	145	E82	6B
16	Dual 3/3 NOR	**10111/10511**	2.4	145	E82	4L,6B,9B
17	Dual 3/3 NOR	**10211/10611**	1.5	160	E82	4L,6B

*105XX and 106XX = Military temperature range

ECL

SSI FUNCTIONS (Cont'd)

Item	Function	DEVICE NO.*	t_{pd} ns (Typ)	Power Dissipation mW (Typ)	Logic/ Connection Diagram	Package(s)
NOR Gates (Cont'd)						
1	Triple NOR	**95106**	2.0	75	E78	6B
2	Triple NOR	**10106/10506**	2.0	75	E78	4L,6B,9B
3	Quad NOR	**9504**	2.3	280	E68	6B
4	Quad NOR	**95H04**	1.6	250	E68	6B
5	Quad NOR	**95H24**	1.6	210	E68	6B
6	Quad NOR	**95L24**	2.0	80	E68	6B
7	Quad NOR	**95004**	2.0	90	E73	6B
8	Quad NOR	**95102**	2.0	100	E75	6B
9	Quad NOR	**10100/10500**	2.0	100	E96	4L,6B,9B
10	Quad NOR	**10102/10502**	2.0	100	E75	4L,6B,9B
OR/NOR Gates						
11	Dual OR/NOR	**9502**	2.3	180	E66	6B
12	Dual OR/NOR	**95H02**	1.6	170	E66	6B
13	Dual OR/NOR	**95H22**	1.6	130	E66	6B
14	Dual OR/NOR	**95L22**	2.0	55	E66	6B
15	Dual OR/NOR	**95002**	2.0	50	E71	6B
16	Dual OR/NOR	**95109**	2.0	50	E80	6B
17	Dual OR/NOR	**10109/10509**	2.0	50	E80	4L,6B,9B
18	Dual OR/NOR	**11C01**	0.7	125	E94	4L,6B
19	Triple OR/NOR	**9503**	2.3	250	E67	6B
20	Triple OR/NOR	**95H03**	1.6	225	E67	6B
21	Triple OR/NOR	**95H23**	1.6	165	E67	6B
22	Triple OR/NOR	**95L23**	2.0	65	E67	6B
23	Triple OR/NOR	**95003**	2.0	75	E72	6B
24	Triple OR/NOR	**95105**	2.0	75	E77	6B
25	Triple OR/NOR	**10105/10505**	2.0	75	E77	4L,6B,9B
26	Triple OR/NOR	**100101**	0.7	120	F89	4Q,6Q
27	Triple Exc OR/NOR	**95107**	2.4	115	E79	6B
28	Triple Exc OR/NOR	**10107/10507**	2.4	115	E79	4L,6B,9B
29	Quad OR/NOR	**95101**	2.0	100	E74	6B

*105XX and 106XX = Military temperature range

ECL

SSI FUNCTIONS (Cont'd)

Item	Function	DEVICE NO.*	t_{pd} ns (Typ)	Power Dissipation mW (Typ)	Logic/ Connection Diagram	Package(s)
OR/NOR Gates (Cont'd)						
1	Quad OR/NOR	**10101/10501**	2.0	100	E74	4L,6B,9B
2	Quint OR/NOR	**100102**	0.7	230	E90	4Q,6Q
3	Quint Exc OR/NOR	**100107**	0.7	300	E91	4Q,6Q
OR/AND Gates						
4	2-Wide OA	**10118/10518**	2.3	105	E86	4L,6B,9B
5	4-Wide OA	**9505**	2.6	315	E69	6B
6	4-Wide OA	**10119/10519**	2.3	105	E87	4L,6B,9B
OR/AND/Invert Gates						
7	Triple 2-Wide OA/OAI	**100117**	0.7	240	E92	4Q,6Q
8	5-Wide OA/OAI	**100118**	0.7	175	E93	4Q,6Q
9	Dual 2-Wide OAI	**10117/10517**	2.3	105	E85	4L,6B,9B
10	4-Wide OAI	**10121/10521**	2.3	105	E88	4L,6B,9B
AND/NAND Gates						
11	Quad AND/NAND	**9507**	3.2	315	E70	6B

LATCHES/FLIP-FLOPS

Item	Function	DEVICE NO.*	Data Inputs	Direct Set/Clear or Common Clear	Enable/Clock Inputs (Level)	Required Enable/Clock Pulse Width-ns (Typ)	Enable /Clock to Q Delay-ns (Typ)	Data to Q Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
12	750 MHz D Flip-Flop	**11C06**	2	No	_|¯	0.7	1.0	1.0	210	E43	6B
13	Dual D Flip-Flop	**9528**	2	Yes	_|¯	3.0	3.6	3.6	330	E26	6B
14	Dual D Flip-Flop	**95H28**	2	Yes	_|¯	2.0	3.0	3.0	330	E26	6B
15	Dual D Flip-Flop	**95231**	2	Yes	_|¯	2.5	2.8	2.8	245	E31	6B
16	Dual D Flip-Flop	**10131/10531**	2	Yes	_|¯	3.0	3.0	2.2	235	E31	4L,6B,9B
17	Dual D Flip-Flop	**10231/10631**	2	Yes	_|¯	2.5	2.8	2.8	245	E31	4L,6B,9B
18	Triple D Flip-Flop	**100131**	3	Yes	_|¯	1.0	1.3	0.85	475	E46	4Q,6Q
19	Hex D Flip-Flop	**10176/10576**	6	No	_|¯	3.0	3.0	5.0	455	E40	4L,6B,9B

*105XX and 106XX = Military temperature range

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LATCHES/FLIP-FLOPS (Cont'd)

Item	Function	DEVICE NO.*	Data Inputs	Direct Set/Clear or Common Clear	Enable/Clock Inputs (Level)	Required Enable/Clock Pulse Width-ns (Typ)	Enable /Clock to Q Delay-ns (Typ)	Data to Q Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Hex D Flip-Flop	**10186/10586**	6	Yes	↑	3.0	3.0	5.0	455	E41	4L,6B,9B
2	Hex D Flip-Flop	**100151**	6	Yes	↑	1.4	1.1	0.75	550	E48	4Q,6Q
3	Master/Slave D Flip-Flop	**11C70**	1	Yes	↑	0.7	1.0	1.0	210	E44	6B
4	JK Flip-Flop	**95H29**	1	Yes	↑	2.0	3.0	3.0	180	E27	6B
5	JK Flip-Flop	**95029**	3	Yes	↑	2.0	2.8	2.8	185	E29	6B
6	Dual JK Flip-Flop	**10135/10535**	2	No	↑	2.5	3.0	3.0	235	E35	4L,6B,9B
7	Dual D Latch	**95130**	2	Yes	H	2.5	2.7	2.5	135	E30	6B
8	Dual D Latch	**10130/10530**	2	Yes	H	2.5	2.7	2.5	135	E30	4L,6B,9B
9	Triple D Latch	**100130**	3	Yes	H	1.0	1.3	0.85	400	E45	4Q,6Q
10	Quad Latch	**9534**	4	Yes	L	2.2	5.6	4.3	415	E28	6B
11	Quad Latch	**10133/10533**	4	No	L	4.0	4.0	4.0	310	E33	4L,6B,9B
12	Quad Latch	**10153/10553**	4	No	H	4.0	4.0	4.0	310	E36	4L,6B,9B
13	Quad Latch	**10168/10568**	4	No	L	4.0	4.0	4.0	310	E39	4L,6B,9B
14	Quint Latch	**10175/10575**	5	Yes	H	3.3	3.3	2.5	405	E49	4L,6B,9B
15	Hex D Latch	**100150**	6	Yes	H	1.4	1.1	0.75	420	E37	4Q,6Q
16	Dual Mux/Latch	**10132/10532**	4	Yes	H	4.5	4.5	3.5	230	E32	4L,6B,9B
17	Dual Mux/Latch	**10134/10534**	4	No	H	4.6	4.5	3.0	230	E34	4L,6B,9B
18	Quad Mux/Latch	**10173/10573**	8	No	H	4.5	4.5	2.5	310	E38	4L,6B,9B
19	Quad Mux/Latch	**100155**	4+4	Yes	H	1.2	1.2	0.85	430	E47	4Q,6Q

*105XX and 106XX = Military temperature range

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MULTIPLEXERS

Item	Function	DEVICE NO.*	Enable Inputs	True Output	Complement Output	Select Delay ns (Typ)	Enable Delay ns (Typ)	Data Delay ns (Typ)	Power Dissipation mW (Typ)	Fan-Out	Logic/Connection Diagram	Package(s)
1	Dual Multiplexer	**10174/10574**	1	2	0	4.0	2.0	3.0	210	50 Ω Line	E54	4L,6B,9B
2	Triple Multiplexer	**100171**	1	3	3	1.7	2.0	0.8	360	50 Ω Line	E55	4Q,6Q
3	Triple Multiplexer	**9580**	1	3	0	3.2	3.2	2.6	300	50 Ω Line	E51	6B
4	Quad Multiplexer	**9579**	0	4	0	4.0	—	2.6	260	50 Ω Line	E50	6B
5	Quad Multiplexer	**10158/10558**	0	4	0	3.2	—	2.5	200	50 Ω Line	E98	4L,6B,9B
6	Quad Multiplexer	**10159/10559**	1	0	4	3.2	2.5	2.5	220	50 Ω Line	E97	4L,6B,9B
7	8-to-1 Multiplexer	**9581**	1	1	0	5.5	3.5	3.2	260	50 Ω Line	E52	6B
8	8-to-1 Multiplexer	**10164/10564**	1	1	0	4.0	2.0	3.0	285	50 Ω Line	E53	4L,6B,9B
9	16-to-1 Multiplexer	**100164**	0	1	0	2.1	—	1.6	315	50 Ω Line	E99	4Q,6Q
10	Dual 8 Multiplexer	**100163**	0	2	0	1.95	—	1.3	500	50 Ω Line	E112	4Q,6Q

DECODERS/DEMULTIPLEXERS

Item	Function	DEVICE NO.*	Address Inputs	Active LOW Enable	Active LOW Outputs	Active HIGH Outputs	Select Delay ns (Typ)	Enable Delay ns (Typ)	Power Dissipation mW (Typ)	Fan-Out	Logic/Connection Diagram	Package(s)
11	1-of-8 Decoder	**9538**	3	2	8	0	3.0	5.0	275	50 Ω Line	E7	6B
12	1-of-8 Demux/Decoder	**10161/10561**	3	2	8	0	4.0	4.0	285	50 Ω Line	E8	4L,6B,9B
13	1-of-8 Demux/Decoder	**10162/10562**	3	2	0	8	4.0	4.0	285	50 Ω Line	E9	4L,6B,9B
14	Dual 1-of-4 Demux/ Decoder	**10171/10571**	2	2+1	4+4	0	4.0	4.0	320	50 Ω Line	E10	4L,6B,9B
15	Dual 1-of-4 Demux/ Decoder	**10172/10572**	2	2+1	0	4+4	4.0	4.0	320	50 Ω Line	E11	4L,6B,9B
16	Multipurpose Demux/ Decoder	**100170**	5	2+2	4or8	4or8	1.7	1.2	565	50 Ω Line	E12	4Q,6Q

*105XX and 106XX = Military temperature range

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REGISTERS

Item	Function	DEVICE NO.*	No. of Bits	Serial Entry	Parallel Entry No. of Bits	Max Clock Freq. MHz (Typ)	Clock To Output Delay-ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	4-Bit Shift Register	**95H00**	4	D	4S	150	3.2	395	E63	6B
2	4-Bit Shift Register	**95000**	4	D	4S	200	3.2	345	E64	6B
3	4-Bit Shift Register	**10000**	4	D	4S	200	3.2	345	E64	4L,6B,9B
4	4-Bit Left/Right Shift Register	**10141/10541**	4	D_L,D_R	4S	350	2.2	400	E65	4L,6B,9B
5	8-Bit Left/Right Shift Register	**100141**	8	D_R	8	500	1.6	765	E100	4Q,6Q
6	16x4 Register File	**100145A**	64	D_R	—	—	—	765	E101	4Q,6Q
7	8-Bit Shift Matrix	**100158**	8	—	8	—	—	630	E102	4Q,6Q

COUNTERS/PRESCALERS

Item	Function	DEVICE NO.*	Modulo	Parallel Load	Max Clock Rate MHz (Typ)	Clock to Q Output Delay ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
8	Binary Counter	**95H16**	2,4,8 or 16	4	200	3.6	470	E1	6B
9	Binary Counter	**95016**	2,4,8 or 16	4	200	3.6	415	E3	6B
10	Binary Counter	**10016**	2,4,8 or 16	4	200	3.6	415	E3	4L,7B,9B
11	Binary Counter	**10136/10536**	2,4,8 or 16	4	200	—	520	E4	4L,7B
12	Binary Counter/Register	**100136**	2,4,8 or 16	4	450	1.4	765	E103	4Q,6Q
13	Decade Counter	**95010**	10	4	200	3.6	415	E3	6B
14	Decade Counter	**10010**	10	4	200	3.6	415	E3	4L,7B,9B
15	Decade Counter	**10137/10537**	10	4	200	—	520	E4	4L,7B
16	÷ 4 Prescaler	**11C05**	4	—	1100	—	340	E5	6B
17	÷ 5/6 Prescaler	**95H91**	5 or 6	MS	320	5.1	390	E2	6B
18	÷ 5/6 Prescaler	**11C91**	5 or 6	MS	600	—	300	E6	6B
19	÷ 10/11 Prescaler	**95H90**	10 or 11	MS	320	5.1	440	E2	6B
20	÷ 10/11 Prescaler	**11C90**	10 or 11	MS	600	—	300	E6	6B
21	÷ 248/256 Prescaler	**11C83**	248 or 256	MS	1100	—	520	E104	6A

*105XX and 106XX = Military temperature range

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ARITHMETIC OPERATORS

Item	Function	DEVICE NO.*	No. of Input Bits	t_{pd} ns (Typ)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
1	Adder/Subtractor	**95H84**	2x2	4.6	485	E58	6B
2	Dual Adder/Subtractor	**10180/10580**	2x2	2.2	340	E62	4L,6B,9B
3	Carry Lookahead	**10179/10579**	4x2	3.0	305	E61	4L,6B,9B
4	Carry Lookahead	**100179**	16	2.1	742	E111	4Q,6Q
5	4-Bit ALU	**10181/10581**	4x2	6.0	600	E95	4M,6N
6	4-Bit Binary/Decimal ALU	**100181**	4x2	4.5	765	E107	4Q,6Q
7	4-Bit Comparator	**9578**	4x2	3.2	275	E57	6B
8	5-Bit Comparator	**95H55**	5x2	6.0	440	E56	6B
9	5-Bit Comparator	**10166/10566**	5x2	5.5	312	E42	4L,6B,9B
10	9-Bit Comparator	**100166**	9	—	—	E114	4Q,6Q
11	8-Input Priority Encoder	**10165/10565**	8	6.0	520	E13	4L,6B,9B
12	Universal Priority Encoder	**100165**	8	3.0	540	E108	4Q,6Q
13	Dual 9-Bit Parity Generator	**100160**	9x2	3.0	370	E109	4Q,6Q
14	11-Bit Parity Generator	**10170/10570**	11	4.0	275	E60	4L,6B
15	12-Bit Parity Generator	**10160/10560**	12	4.0	240	E59	4L,6B,9B
16	8-Bit Shift Matrix	**100158**	8	2.2	630	E102	4Q,6Q

*105XX and 106XX = Military temperature range

CMOS

SSI FUNCTIONS

Item	Function	DEVICE NO.	Logic/Connection Diagram	Package(s)
NAND Gates				
17	Quad 2-Input NAND	**4011B**	C1	3I,6A,9A
18	Triple 3-Input NAND	**4023B**	C2	3I,6A,9A
19	Dual 4-Input NAND	**4012B**	C3	3I,6A,9A
20	8-Input NAND	**4068B**	C4	3I,6A,9A

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CMOS

SSI FUNCTIONS (Cont'd)

Item	Function	DEVICE NO.	Logic/Connection Diagram	Package(s)
NOR Gates				
1	Quad 2-Input NOR	**4001B**	C5	3I,6A,9A
2	Triple 3-Input NOR	**4025B**	C6	3I,6A,9A
3	Dual 4-Input NOR	**4002B**	C7	3I,6A,9A
4	8-Input NOR	**4078B**	C8	3I,6A,9A
AND Gates				
5	Quad 2-Input AND	**4081B**	C9	3I,6A,9A
6	Triple 3-Input AND	**4073B**	C87	3I,6A,9A
7	Dual 4-Input AND	**4082B**	C88	3I,6A,9A
OR Gates				
8	Quad 2-Input OR	**4071B**	C10	3I,6A,9A
9	Dual 4-Input OR	**4072B**	C85	3I,6A,9A
10	Triple 3-Input OR	**4075B**	C86	3I,6A,9A
Inverters and Buffers				
11	Hex Inverter	**4069UB**	C11	3I,6A,9A
12	Hex Inverting Buffer	**4049B**	C12	4L,6B,9B
13	Hex Non-Inverting Buffer	**4050B**	C13	4L,6B,9B
14	3-State Hex Inverting Buffer	**40098B**	C14	4L,6B,9B
15	3-State Hex Non-Inverting Buffer	**40097B**	C15	4L,6B,9B
16	Quad True/Complement Buffer	**4041B**	C81	3I,6A,9A
Complex Gates				
17	Quad Exclusive OR	**4030B**	C16	3I,6A,9A
18	Quad Exclusive OR	**4070B**	C16	3I,6A,9A
19	Quad Exclusive NOR	**4077B**	C17	3I,6A,9A
20	Dual 2-Wide, 2-Input AND-OR-Invert	**4085B**	C18	3I,6A,9A
21	4-Wide, 2-Input AND-OR-Invert	**4086B**	C19	3I,6A,9A
22	Dual Complementary Pair Plus Inverter	**4007UB**	C20	3I,6A,9A
Schmitt Triggers				
23	Quad 2-Input NAND Schmitt Trigger	**4093B**	C82	3I,6A,9A
24	Dual Schmitt Trigger	**4583B**	C83	4L,6B,9B
25	Hex Schmitt Trigger	**40014B**	C84	3I,6A,9A

CMOS

LATCHES/FLIP-FLOPS

Item	Function	DEVICE NO.	Data Inputs	Common Clear	Enable/Clock Inputs (Level)	Required Enable/Clock Pulse Width-ns (Typ) V_{DD} = 10V	Enable/Clock to Q Delay-ns (Typ) V_{DD} = 10V	Logic/Connection Diagram	Package(s)
1	Dual JK Flip-Flop	**4027B**	JK	RS	H	35	45	C21	4L,6B,9B
2	Dual D Flip-Flop	**4013B**	D	RS	H	30	38	C22	3I,6A,9A
3	Quad D Flip-Flop	**40175B**	D	X	H	10	35	C23	4L,6B,9B
4	Quad D Flip-Flop w/3-State Ouptuts	**4076B**	D	MR	L	35	35	C110	4L,6B,9B
5	Hex D Flip-Flop	**40174B**	D	X	H	10	35	C24	4L,6B,9B
6	4-Bit Latch	**4042B**	D	—	H	16	66	C25	4L,6B,9B
7	4-Bit Latch	**4043B**	RS	RS	H	14	30	C26	4L,6B,9B
8	4-Bit Latch	**4044B**	RS	RS	H	14	30	C27	4L,6B,9B
9	Dual 4-Bit Address Latch	**4723B**	D	X	L	20	50	C28	4L,6B,9B
10	8-Bit Address Latch	**4724B**	D	X	L	20	40	C29	4L,6B,9B
11	BCD-to-7-Seg Latch/Decoder/Dvr	**4511B**	D	X	L	14	90	C111	4L,6B,9B
12	BCD-to-7-Seg Latch/Decoder/Dvr for Liquid Crystal	**4543B**	D	X	H	40	200	C112	4L,6B,9B
13	BCD-to-7-Seg Latch/Decoder Dvr w/Ripple Blanking	**4734B**	D	X	L	14	90	C114	7D,9M

MULTIPLEXERS

Item	Function	DEVICE NO.	Enable Inputs	True Output	Select Delay ns (Typ) V_{DD} = 10V	Enable Delay ns (Typ) V_{DD} = 10V	Data Delay ns (Typ) V_{DD} = 10V	Logic/Connection Diagram	Package(s)
14	Quad 2-Input	**4019B**	—	X	37	—	37	C30	4L,6B,9B
15	Quad 2-Input	**4519B**	—	X	50	—	50	C31	4L,6B,9B
16	Dual 4-Input	**4539B**	X	X	88	53	71	C32	4L,6B,9B
17	Single 8-Input	**4512B**	X	3-State	85	45	75	C33	4L,6B,9B

CMOS

REGISTERS

Item	Function	DEVICE NO.	No. of Bits	Serial Entry	Parallel Entry No. of Bits	Clock Edge	Max Clock Frequency MHz (Typ) V_{DD} = 10V	Clock To Output Delay-ns (Typ) V_{DD} = 10V	Logic/Connection Diagram	Package(s)
1	Parallel-In/Parallel-Out	**4035B**	4	$J\overline{K}$	4	L→H	17	90	C39	4L,6B,9B
2	Parallel-In/Parallel-Out Bidirectional	**40194B**	4	D	4	L→H	14	45	C40	4L,6B,9B
3	Parallel-In/Parallel-Out	**40195B**	4	$J\overline{K}$	4	L→H	14	45	C41	4L,6B,9B
4	Serial-In/Parallel-Out	**4015B**	8	D	—	L→H	14	85	C42	4L,6B,9B
5	Parallel-In/Serial-Out	**4014B**	8	D	8	L→H	14.7	68	C43	4L,6B,9B
6	Parallel-In/Serial-Out	**4021B**	8	D	8	L→H	18.1	74	C44	4L,6B,9B
7	Serial-In/Serial-Out	**4006B**	18	D	—	H→L	30	37	C45	3I,6A,9A
8	Serial-In/Serial-Out	**4731B**	256	D	—	H→L	8.0	95	C46	3I,6A,9A
9	Serial-In/Serial-Out	**4031B**	64	D	—	L→H	8.0	60	C78	4L,6B,9B
10	Serial-In/Serial-Out Variable	**4557B**	1 to 64	D	—	2- H→L or L→H	10	150	C80	4L,6B,9B
11	Parallel/Serial-Input/Output	**4034B**	8	D	8	L→H	8.0	155	C79	4M,6N,9N

DECODERS/DEMULTIPLEXERS

Item	Function	DEVICE NO.	Address Inputs	Active LOW Enable	Output Configuration	Select Delay ns (Typ) V_{DD} = 10V	Enable Delay ns (Typ) V_{DD} = 10V	Logic/Connection Diagram	Package(s)
12	Dual 1-of-4 Decoder	**4555B**	2x2	2	H	60	60	C34	4L,6B,9B
13	Dual 1-of-4 Decoder	**4556B**	2x2	2	L	68	58	C35	4L,6B,9B
14	1-of-10 Decoder	**4028B**	4	—	H	66	—	C36	4L,6B,9B
15	1-of-16 Decoder	**4514B**	4	1	H	95	95	C37	4M,6N,9N,9U
16	1-of-16 Decoder	**4515B**	4	1	L	95	95	C38	4M,6N,9N,9U
17	Dual 4-Channel Demultiplexer	**4052B**	2	1	H	125	105	C64	4L,6B,9B

CMOS

DECODERS/DEMULTIPLEXERS (Cont'd)

Item	Function	DEVICE NO.	Address Inputs	Active LOW Enable	Output Configuration	Select Delay ns (Typ) V_{DD} = 10V	Enable Delay ns (Typ) V_{DD} = 10V	Logic/Connection Diagram	Package(s)
1	8-Channel Demultiplexer	**4051B**	3	1	H	125	105	C65	4L,6B,9B
2	BCD-to-7-Segment Latch/Decoder/Dvr	**4511B**	4	1	H	90	98	C111	4L,6B,9B
3	BCD-to-7-Segment Latch/Decoder/ Dvr for Liquid Crystals	**4543B**	4	—	H or L	200	200	C112	4L,6B,9B
4	BCD-to-7-Segment Latch/Decoder/ Dvr w/Ripple Blanking	**4734B**	4	1	H	90	98	C114	7D,9M

COUNTERS

Item	Function	DEVICE NO.	Modulo	Parallel Load(1)	Clock Transition	Max Clock Rate MHz (Typ) V_{DD} = 10V	Clock to Q Output Delay ns (Typ) V_{DD} = 10V	Logic/Connection Diagram	Package(s)
5	4-Bit Sync Count Up	**40160B**	Decade	S	L→H	12	55	C47	4L,6B,9B
6	4-Bit Sync Count Up	**40161B**	Binary	S	L→H	12	55	C47	4L,6B,9B
7	4-Bit Sync Count Up	**40162B**	Decade	S	L→H	12	55	C48	4L,6B,9B
8	4-Bit Sync Count Up	**40163B**	Binary	S	L→H	12	55	C48	4L,6B,9B
9	4-Bit Sync Count Down	**4522B**(2)	Decade	A	L→H or H→L	10	95	C49	4L,6B,9B
10	4-Bit Sync Count Down	**4526B**(2)	Binary	A	L→H or H→L	10	95	C49	4L,6B,9B
11	4-Bit Sync Count Up/Down	**4510B**	Decade	A	L→H	12	62	C50	4L,6B,9B
12	4-Bit Sync Count Up/Down	**4516B**	Binary	A	L→H	12	62	C50	4L,6B,9B
13	4-Bit Sync Count Up/Down	**40192B**	Decade	A	L→H	8.0	105	C51	4L,6B,9B

1. A = Asynchronous, S = Synchronous
2. To be announced

CMOS

COUNTERS (Cont'd)

Item	Function	DEVICE NO.	Modulo	Parallel Load[1]	Clock Transition	Max Clock Rate MHz (Typ) V_{DD} = 10V	Clock to Q Output Delay ns (Typ) V_{DD} = 10V	Logic/Connection Diagram	Package(s)
1	4-Bit Sync Count Up/Down	**40193B**	Binary	A	L→H	8.0	105	C51	4L,6B,9B
2	4-Bit Sync Count Up/Down	**4029B**	Decade or Binary	A	L→H	12	62	C52	4L,6B,9B
3	Dual 4-Bit Sync Count Up	**4518B**	Decade	—	L→H or H→L	10	95	C53	4L,6B,9B
4	Dual 4-Bit Synchronous Count Up	**4520B**	Binary	—	L→H or H→L	10	95	C53	4L,6B,9B
5	7-Bit Ripple Count Up	**4024B**	Binary	—	H→L	30	45	C54	3I,6A,9A
6	12-Bit Ripple Count Up	**4040B**	Binary	—	H→L	25	55	C55	4L,6B,9B
7	14-Bit Ripple Count Up	**4020B**	Binary	—	H→L	25	55	C56	4L,6B,9B
8	4-Bit Johnson Counter	**4022B**[2]	1-of-8	—	L→H or H→L	16	95	C57	4L,6B,9B
9	5-Bit Johnson Counter	**4017B**	1-of-10	—	L→H or H→L	13.8	114	C58	4L,6B,9B
10	5-Bit Johnson Counter	**4018B**[2]	—	—	L→H	10	115	C59	4L,6B,9B
11	Bit Rate Generator	**4702B**	14-Bit Rates	—	L→H	6.5	40	C60	4L,6B,9B
12	21-Stage Binary Counter	**4045B**	Binary	—	L→H	25	900	C89	3I,6A,9A
13	24-Stage Binary Counter	**4521B**	Binary	—	H→L	12	3200	C90	4L,6B,9B
14	Real Time 5-Decade Counter	**4534B**	Decade (x5)	—	L→H	4.5	1000	C91	4M,6N,9N
15	3-Digit BCD Counter	**4553B**	Decade (x3)	—	L→H or H→L	6.0	300	C92	4L,6B,9B
16	7-Stage Counter	**4727B**	Binary	—	L→H	8.0	90	C93	3I,6A,9A
17	7-Stage Counter	**4737B**	Binary	—	L→H	8.0	90	C95	3I,6A,9A
18	Programmable Timer/Counter	**4722B**	Binary	—	H→L	6.0	1000	C94	4L,6B,9B
19	Industrial Time Base Generator	**4566B**	Decade	—	H→L	3.2	400	C99	4L,6B,9B

1. A = Asynchronous, S = Synchronous
2. To be announced

CMOS

MONOSTABLES

Item	Function	DEVICE NO.	Typical Pulse Width Variation (%) V_{DD} = 15V	No. of Inputs Positive	No. of Inputs Negative	Resettable	Output (t_{pw})-ns V_{DD} = 5.0V	Logic/Connection Diagram	Package(s)
1	Dual Retriggerable Resettable Monostable Multivibrator	**4528B**	±3%	1	1	X	300	C61	4L,6B,9B
2	Low Power Monostable/ Astable Multivibrator	**4047B**	—	1	1	X	—	C115	3I,6A,9A
3	Dual Precision Monostable Multivibrator	**4538B**	±0.5%	1	1	X	200	C116	4L,6B,9B
4	Micro Power Phase Locked Loop	**4046B**	—	—	—	—	—	C117	4L,6B,9B

ANALOG DEVICES

Item	Function	DEVICE NO.	Enable Input	Max ON Resistance-Ω V_{DD} = V_{IS} = 10V	Max OFF State Leakage Current-nA V_{DD} = 10V	Signal Capability V	Logic/Connection Diagram	Package(s)
5	Quad Bilateral Switch	**4016B**	X	840	125	0-15 ±7.5	C63	3I,6A,9A
6	Quad Bilateral Switch	**4066B**	X	520	100	0-15 ±7.5	C63	3I,6A,9A
7	Dual 4-Channel Multiplex/Demultiplex	**4052B**	X	600	100	0-15 ±7.5	C64	4L,6B,9B
8	8-Channel Multiplexer/Demultiplexer	**4051B**	X	600	100	0-15 ±7.5	C65	4L,6B,9B
9	Triple 2-Channel Multiplex/Demultiplexer	**4053B**	X	600	100	0-15 ±7.5	C96	4L,6B,9B
10	16 Channel Mux/Demux	**4067B**	X	600	100	0-15 ±7.5	C97	4M,6Q,9U
11	4x4 Cross Point Switch	**4741B**	X	840	100	0-15 ±7.5	C98	4L,6B,9B

CMOS

ARITHMETIC OPERATORS

Item	Function	DEVICE NO.	Description	No. of Bits	Logic/Connection Diagram	Package(s)
1	Adder	**4008B**	Binary Adder	4	C66	4L,6B,9B
2	Adder	**4560B**	BCD Adder	4x2	C106	4L,6B,9B
3	Carry Lookahead	**4582B**	Carry Lookahead Block	4	C68	4L,6B,9B
4	Comparator	**40085B**	Magnitude Comparator	4	C69	4L,6B,9B
5	Data Path Switch	**4704B**	Data Path Switch	4	C70	4M,6Q,9U
6	Arithmetic Logic Register Stack	**4705B**	Arith Logic Register Stack	4	C71	4M,6Q,9U
7	Data Access Register	**4707B**	Data Access Register	4	C72	4M,6Q,9U
8	Register Unit	**4581B**	4-Bit Arithmetic Logic Register Unit	4x2	C108	4M,6N,9N
9	Rate Multiplier	**4527B**	BCD Rate Multiplier	4	C103	4L,6B,9B
10	Parity Checker/Generator	**4531B**	13-Input Parity Checker/ Generator	13	C104	4L,6B,9B
11	Parity Encoder	**4532B**	8-Input Parity Encoder	8	C105	4L,6B,9B
12	Complementer	**4561B**	9's Complementer	4	C107	3I,6A,9A
13	Sequencer	**4708B**	10-Bit Microprocessor Sequencer	10	C109	6I,8P

TIMEKEEPING CIRCUITS

Item	DEVICE NO.[1]	No. of Digits	Digit Drive	LED	LCD	Calendar	Backup Osc	Alarm	Timer	24 Hr Options	Radio Off/On	Voltage	Special Features	Logic/Connection Diagram	Package(s)[2]
14	**FWA6003/ FWA6103**	4	Dir	No	Yes	Yes	Yes	No	No	No	No	1.5	Seconds and date on command	C119 C118	—
15	**FWA6005/ FWA6105**	4	Dir	No	Yes	Yes	Yes	No	No	No	No	1.5	6003 w/on-board voltage quadrupler	C120 C121	—
16	**FWA6004**	4	Mux	Yes	No	Yes	Yes	No	No	No	No	3.0	Seconds, ideal car clock	C122	—
17	**FWX6107**	4	Dir	No	Yes	Yes	Yes	No	No	No	No	1.5	6105 w/24 hr and European calendar	—	—
18	**FWX6109**	6	Dir	No	Yes	Yes	Yes	No	No	No	No	1.5	5-function w/day flags	—	—
19	**FWX6111**	6	Dir	No	Yes	Yes	Yes	No	No	No	No	1.5	6-function w/alpha day		—

1. FWAXXXX products are available both encapsulated, FWBXXXX, & unencapsulated, FWXXXXX.
2. Consult factory for package type

MOS

RANDOM LOGIC FUNCTIONS (For Other MOS Circuits—See Fairchild Memories)

Item	Function	DEVICE NO.	Temperature (1)	No. of Pins	Logic/Connection Diagram	Packages(s) (4)
1	TV Sync Generator	**3262A**	C	16	S1	6Z
2	TV Sync Generator with Generator Lock	**3262B**	C	16	S2	6Z
3	8-Channel Multiplex Switch	**3708**	C, L, M	16	S3	4A,6Z,8K 8U,9B
4	Digital Voltmeter	**3814**	C	24	S4	7M
5	5-Decade Counter	**3815**	C	24	S5	7M
6	Programmable Counter 3 thru 262,145	**3816**	C	16	S6	6Z,8K,9B
7	USART	**F3843**	C	28	S8	8E
8	Synchronous Protocol Communications Controller	**F3846** (3)	C	40	—	—

TIMEKEEPING CIRCUITS

Item	DEVICE NO.	No. of Digits	Digit Drive	LED	LCD	Calendar	Backup Osc	Alarm	Timer	24 Hr Options	Radio Off/On	Voltage	Special Features	Logic/Connection Diagram	Package(s) (4)
9	**FCM7001**	6	Mux	Yes	Yes	Yes	Yes	Yes	9:59	Yes	Yes	10-17	Use for very large digits; high drive circuit.	S9	
10	**FCM7002**	6	Mux	—	—	Yes	Yes	Yes	9:59	Yes	Yes	10-17	BCD outputs	S10	
11	**FCM7003**	6	Mux	Yes	Yes	Yes	Yes	Yes	9:59	Yes	Yes	10-17	Direct drive for gas discharge	S11	
12	**FCM7004**	6	Mux	Yes	Yes	Yes	Yes	Yes	9:59	Yes	Yes	10-17	7001 w/European calendar format	S9	
13	**FCM7010**	4	Dir	Yes	Yes	Yes	Yes	Yes	2:50	Yes	Yes	7.0-17	12 mA direct drive, pulsing colon	S12	
14	**FCM7015**	4	Dir	Yes	Yes	Yes	Yes	Yes	2:50	Yes	Yes	7.0-17	12 mA direct static drive, colon, slew set	S12	
15	**FCM7030** (2)	4	Dir	Yes	Yes	No	No	Yes	:59	Yes	Yes	8.0-18	Seconds on command, 15 mA drive	S13	
16	**FCM7040**	4	Dup	Yes	No	No	Yes	Yes	99:59	Yes	Yes	7.0-11	Key BD entry appliance control	S14	

1. C = Commercial temperature range; L = Limited military temperature range; M = Military temperature range.
2. Replaces FMC3817 for new designs
3. To be announced 4. Consult factory for package types.

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RTL/CTL

FAIRCHILD RTL MICROLOGIC AND CTL COUNTING MICROLOGIC ELEMENTS

Item	DEVICE NO.	Description	Logic/Connection Diagram	Package(s)	Item	DEVICE NO.	Description	Logic/Connection Diagram	Package(s)
1	**900**	Buffer	F8	3F,5B	14	**913**	D Flip-Flop	F6	3F,5B
2	**901**	Counter Adapter	F18	3F,5B	15	**914**	Dual 2-NOR	F13	3F,5B
3	**902**	Flip-Flop	F19	3F,5B	16	**915**	Dual 3-NOR	F14	3F,5F
4	**903**	3-Input NOR	F9	3F,5B	17	**921**	Dual 2-Expander	F7	3F,5B
5	**904**	Half Adder	F10	3F,5B	18	**923**	JK Flip-Flop	F15	5B
6	**905**	Half Shift	F11	3F,5B	19	**926**	JK Flip-Flop	F16	3F,5F
7	**906**	Half Shift	F20	3F,5B	20	**927**	Quad Inverter	F17	3F,5F
8	**907**	4-Input NOR	F12	3F,5B	21	**958**	Decade Counter	F21	5B,6A
9	**908**	Adder	F1	3F,5B	22	**959**	4-Bit Latch	F22	6B
10	**909**	Buffer	F2	3F,5B	23	**960**	BCD Decoder/Dvr	F23	6B
11	**910**	Dual 2-NOR	F3	3F,5B	24	**974**	JK Flip-Flop	F15	5B
12	**911**	4-Input NOR	F4	3F,5B	25	**989**	Binary Counter	F21	5B,6A
13	**912**	Half Adder	F5	3F,5B					

DTL

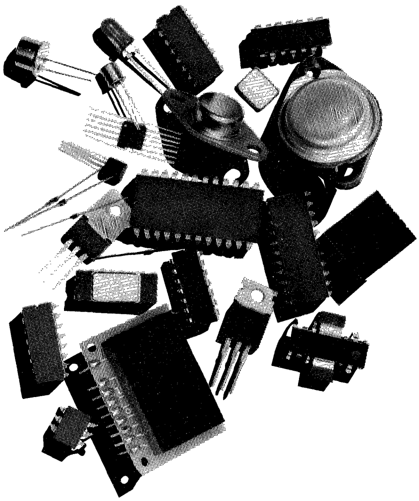
DTL MICROLOGIC

Item	DEVICE NO.	Description	Logic/Connection Diagram	Package(s)
26	**930**	Dual 4-Input Extendable NAND Gate	G1	3I,5F,6A,9A
27	**932**	Dual 4-Input Extendable NAND Buffer Gate	G1	3I,5F,6A,9A
28	**933**	Extender	G9	5F,9A
29	**935**	Extendable Hex Inverter	G12	3I,6A,9A
30	**936**	Hex Inverter	G12	3I,6A,9A
31	**937**	Hex Inverter	G12	3I,6A,9A
32	**941**	Monostable Multivibrator	G17	3I,6A
33	**944**	Dual 4-Input Extendable NAND Buffer Gate (Open Collector)	G1	3I,5F,6A,9A
34	**945**	RS Flip-Flop	G18	3I,5F,6A,9A
35	**946**	Quad 2-Input NAND Gate	G10	3I,5F,6A,9A

DTL

DTL MICROLOGIC (Cont'd)

Item	DEVICE NO.	Description	Logic/Connection Diagram	Package(s)
1	**948**	RS Flip-Flop	G18	3I,5F,6A,9A
2	**949**	Quad 2-Input NAND Gate	G10	3I,5F,6A,9A
3	**950**	A-C Coupled RS Flip-Flop	G19	3I,5F,6A,9A
4	**951**	Monostable Multivibrator	G17	3I,5F,6A,9A
5	**961**	Dual 4-Input Extendable NAND Gate	G1	3I,5F,6A,9A
6	**962**	Triple 3-Input NAND Gate	G11	3I,5F,6A,9A
7	**963**	Triple 3-Input NAND Gate	G11	3I,5F,6A,9A
8	**1800**	Dual 5-Input NAND Gate	G1	9A
9	**1801**	Dual 5-Input NAND Gate	G1	9A
10	**1802**	Single 8-Input NAND Gate	G2	9A
11	**1803**	Single 8-Input NAND Gate	G2	9A
12	**1804**	Single 10-Input NAND Gate	G3	9A
13	**1805**	Single 10-Input NAND Gate	G3	9A
14	**1806**	Quad 2-Input AND Gate	G4	9A
15	**1807**	Quad 2-Input AND Gate	G4	9A
16	**1808**	Quad 2-Input OR Gate	G5	9A
17	**1809**	Quad 2-Input OR Gate	G5	9A
18	**1810**	Quad 2-Input NOR Gate	G6	9A
19	**1811**	Quad 2-Input NOR Gate	G6	9A
20	**1812**	Quad 2-Input Exclusive OR Gate	G7	9A
21	**1813**	Quad Latch	G13	9B
22	**1814**	Quad Latch	G14	9A
23	**9093**	Dual JK Flip-Flop	G15	3I,6A,9A
24	**9094**	Dual JK Flip-Flop	G15	3I,6A,9A
25	**9097**	Dual JK Flip-Flop	G16	3I,6A,9A
26	**9099**	Dual JK Flip-Flop	G16	3I,6A,9A
27	**9109**	High Voltage Hex Inverter	G12	6A
28	**9110**	High Voltage Hex Inverter	G12	6A
29	**9111**	RS Flip-Flop	G20	3I,6A
30	**9112**	High Voltage Hex Inverter	G12	6A
31	**9135**	Hex Inverter (Open Collector)	G12	3I,6A,9A
32	**9157**	Quad 2-Input Buffered NAND Gate	G8	3I,6A,9A
33	**9158**	Quad 2-Input Power NAND Gate	G8	6A,9A



RANDOM ACCESS MEMORIES

BIPOLAR RAMs

Item	Organization	DEVICE NO.	Description(1)	Address Access Time ns (Typ)	Chip Select Access Time ns (Typ)	Read/Write Cycle Time Comm 0°C to +70°C ns (Max)	Read/Write Cycle Time −55°C to +125°C ns (Max)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
TTL										
1	16x4	**54LS/74LS89**(4)	OC	—	—	—	—	—	M1	4L,7B,9B
2	16x4	**54LS/74LS189**(4)	3S	—	—	—	—	—	M1	4L,7B,9B
3	16x4	**54LS/74LS289**(4)	OC	—	—	—	—	—	M1	7B,9B
4	16x4	**7489**	OC	30	30	60/55	60/55	—	M1	4L,7B,9B
5	16x4	**9410**	3S	35	25	50(2)	—	375	M50	7D,9M
6	256x1	**93410**	OC	45	25	60/45	70/55	450	M2	4B,6F,9B
7	256x1	**93410A**	OC	35	20	45	—	450	M2	6D,9B
8	256x1	**93411**	OC	45	25	55/45	65/55	475	M3	4B,6D,9B
9	256x1	**93411A**	OC	40	25	45	—	475	M3	6D,9B
10	256x1	**93L420**	3S	40	20	45	55	250	M3	4B,6D,9B
11	256x1	**93L421**	3S	45	30	90/75	100/90	275	M3	4B,6D,9B
12	256x1	**93421**	3S	35	20	50/35	60/45	475	M3	4B,6D,9B
13	256x1	**93421A**	3S	30	20	40/35	—	475	M3	6D,9B
14	64x9	**93419**	OC	35	15	45	60	725	M4	7Y
15	256x4	**93412**	OC	30	20	45	60/55	475	M5	4K,4R,8T
16	256x4	**93L412**	OC	45	20	60	75/70	250	M5	4K,4R,8T
17	256x4	**93422**	3S	30	20	45	60/55	475	M5	4K,4R,8T
18	256x4	**93L422**	3S	45	20	60	75/70	250	M5	4K,4R,8T
19	1024x1	**93415**	OC	30	15	45	60	475	M6	4B,6D,9B
20	1024x1	**93L415**	OC	35	20	60	70	200	M6	4B,6D,9B
21	1024x1	**93415A**	OC	25	15	30	—	475	M6	6D,9B

1. OC = open collector, 3S = 3-state
2. Measured @ T_A = 25°C
3. Typical Data In to Match Out
4. To be announced

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RANDOM ACCESS MEMORIES

BIPOLAR RAMs (Cont'd)

Item	Organization	DEVICE NO.	Description(1)	Address Access Time ns (Typ)	Chip Select Access Time ns (Typ)	Read/Write Cycle Time 0°C to +70°C ns (Max)	Read/Write Cycle Time −55°C to +125°C ns (Max)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
TTL										
1	1024x1	**93425**	3S	30	15	45	60	475	M6	4B,6D,9B
2	1024x1	**93L425**	3S	35	20	60	70	200	M6	4B,6D,9B
3	1024x1	**93425A**	3S	25	15	30	—	475	M6	6D,9B
4	4096x1	**93470**	OC	30	15	50/55	60/70	800	M15	7D,9M
5	4096x1	**93471**	3S	30	15	50/55	60/70	800	M15	7D,9M
6	4096x1	**93481**	Dynamic, 3S	90	35	120	—	45/350	M16	4B,6E,9B
7	4096x1	**93481A**	Dynamic, 3S	80	35	100	—	45/350	M16	4B,6E,9B
ECL										
8	4x4	**100142**	—	2.7	—	3.3(3)	—	730	M40	4Q,6Q
9	16x4	**95400**	—	14	6.5	17.5/25.5(2)	—	435	M13	6B
10	16x4	**10145A**	—	6.5	4.5	9.0/10(2)	—	500	M14	4L,6B,9B
11	16x4	**100145A**	—	4.8	—	—	—	765	M41	4Q,6Q
12	128x1	**10405**	—	12	5.0	15(2)	—	475	M7	4B,6D
13	256x1	**10410**	—	18	7.0	30/38(2)	—	475	M8	4B,6D,9B
14	256x1	**10411**	—	20	7.0	35/47(2)	—	360	M8	6D,9B
15	256x1	**10414**	—	7.0	4.0	—	—	450	M8	4B,6D
16	256x1	**100414**	—	7.0	4.0	—	—	500	M8	4B,6D
17	1024x1	**10415**	—	25	7.0	35/38(2)	—	475	M9	4B,6D
18	1024x1	**10415A**	—	12	5.0	20/27(2)	—	475	M9	4B,6D
19	1024x1	**100415**	—	12	5.0	20/30(2)	—	500	M9	4Q
20	4096x1	**10470**	—	25	10	—	—	900	M15	7D

1. OC = open collector, 3S = 3-state
2. Measured @ T_A = 25°C
3. Typical Data In to Match Out
4. To be announced

RANDOM ACCESS MEMORIES

MOS/CMOS RAMs

Item	Organization	DEVICE NO.	Description	Access Time ns (Max)	Cycle Time ns (Min)	Power Dissipation mW (Max)	Temperature[1]	No. of Pins	Logic/Connection Diagram	Package(s)
MOS										
1	1024x1	**21L02H**	Static	250	250	158/24[4]	C	16	M22	6Z,8K,8U,9B
2	1024x1	**21L02F**	Static	350	350	158/24[4]	C	16	M22	6Z,8K,8U,9B
3	1024x1	**21L021**	Static	450	450	158/24[4]	C	16	M22	6Z,8K,8U,9B
4	1024x1	**21L022**	Static	650	650	158/24[4]	C	16	M22	6Z,8K,8U,9B
5	1024x1	**2102LH**	Static	250	250	158[2]/220[3]	C,L,M	16	M22	6Z,8K,8U,9B
6	1024x1	**2102LF**	Static	350	350	158[2]/220[3]	C,L,M	16	M22	6Z,8K,8U,9B
7	1024x1	**2102L1**	Static	450	450	158[2]/220[3]	C,L,M	16	M22	6Z,8K,8U,9B
8	1024x1	**2102L2**	Static	650	650	158[2]/220[3]	C,L,M	16	M22	6Z,8K,8U,9B
9	1024x1	**2102H**	Static	250	250	289[2]/385[3]	C,L,M	16	M22	6Z,8K,8U,9B
10	1024x1	**2102F**	Static	350	350	289[2]/385[3]	C,L,M	16	M22	6Z,8K,8U,9B
11	1024x1	**21021**	Static	450	450	289[2]/385[3]	C,L,M	16	M22	6Z,8K,8U,9B
12	1024x1	**21022**	Static	650	650	289[2]/385[3]	C,L,M	16	M22	6Z,8K,8U,9B
13	1024x1	**3542/2102S**	Static	150	150	289	C	16	M22	6Z,8K,8U,9B
14	1024x1	**3542A/2102R**	Static	200	200	289	C	16	M22	6Z,8K,8U,9B
15	256x8	**3539**	Static	650	650	500	C	22	M23	6V
16	256x8	**35392**	Static	500	500	500	C	22	M23	6V

1. C = Commercial temperature range; L = Limited military temperature range; M = Military temperature range
2. Commercial temperature range
3. Military and limited military temperature range
4. Standby power
5. To be announced
6. Typical value @ V_{DD} = 10V

RANDOM ACCESS MEMORIES

MOS/CMOS RAMs (Cont'd)

Item	Organization	DEVICE NO.	Description	Access Time ns (Max)	Cycle Time ns (Min)	Power Dissipation mW (Max)	Temperature [1]	No. of Pins	Logic/Connection Diagram	Package(s)
MOS										
1	1024x4	**F2114** [7]	Static	200	200	350	C	18	M24	—
2	4096x1	**M40272**	Dynamic	150	320	470/36 [4]	C,L	16	M25	8K,8R
3	4096x1	**M40273**	Dynamic	200	375	470/36 [4]	C,L	16	M25	8K,8R
4	4096x1	**M40274**	Dynamic	250	375	470/36 [4]	C,L	16	M25	8K,8R
5	4096x1	**M40275**	Dynamic	300	430	470/36 [4]	C,L	16	M25	8K,8R
6	16,384x1	**F16K3**	Dynamic	200	375	465/20 [4]	C	16	M26	6Z,8K,8R
7	16,384x1	**F16K4**	Dynamic	250	410	465/20 [4]	C	16	M26	6Z,8K,8R
8	16,384x1	**F16K5**	Dynamic	300	500	465/20 [4]	C	16	M26	6Z,8K,8R
CMOS										
9	16x4	**4710B**	Static	95 [6]	—	0.4	C,M	18	M42	7D,9M
10	16x4	**4725B**	Static	100 [6]	—	0.4	C,M	16	M43	4L,6B,9B
11	256x1	**4720B**	Static	95 [6]	—	0.4	C,M	16	M44	4L,6B,9B
12	256x4	**4721B**	Static	240 [6]	—	0.7	C,M	22	M45	4K,4M,6V,7I
13	1024x1	**4736B** [5]	Static	320 [6]	—	0.7	C,M	16	M46	4L,6B,9B

1. C = Commercial temperature range; L = Limited military temperature range; M = Military temperature range
2. Commercial temperature range
3. Military and limited military temperature range
4. Standby power
5. To be announced
6. Typical value @ V_{DD} = 10V
7. Consult factory for package information

READ ONLY MEMORIES

BIPOLAR ROMs AND PROMs

Item	Organization	DEVICE NO.	Description (1)	Address Access Time ns (Typ)	Chip Select Access Time ns (Typ)	Read Cycle Time 0°C to +70°C ns (Max)	Read Cycle Time −55°C to +125°C ns (Max)	Power Dissipation mW (Typ)	Logic/Connection Diagram	Package(s)
TTL										
1	16x48x8	**93458**	FPLA,OC	25	15	—	—	750	M20	8E,9Y
2	16x48x8	**93459**	FPLA,3S	25	15	—	—	750	M20	8E,9Y
3	256x4	**93457**	ROM,OC	25	12	45	60	425	M17	3D,6D,9B
4	256x4	**93467**	ROM,3S	25	12	45	60	425	M17	3D,6D,9B
5	256x4	**93417**	PROM,OC	25	12	45	60	425	M17	3D,6D,9B
6	256x4	**93427**	PROM,3S	25	12	45	60	425	M17	3D,6D,9B
7	512x4	**93436**	PROM,OC	30	15	50	60	475	M10	3D,6D,9B
8	512x4	**93446**	PROM,3S	30	15	50	60	475	M10	3D,6D,9B
9	512x4	**93431**	ROM,OC	30	15	50	60	475	M10	4B,6D,9B
10	512x4	**93441**	ROM,3S	30	15	50	60	475	M10	4B,6D,9B
11	512x8	**93432**	ROM,OC	35	15	55	70	650	M11	4R,6M,7L,9N
12	512x8	**93442**	ROM,3S	35	15	55	70	650	M11	4R,6M,7L,9N
13	512x8	**93438**	PROM,OC	35	15	55	70	650	M11	4R,6M,7L,9N
14	512x8	**93448**	PROM,3S	35	15	55	70	650	M11	4R,6M,7L,9N
15	1024x4	**93452**	PROM,OC	30	15	55	70	650	M18	8F,9M
16	1024x4	**93453**	PROM,3S	30	15	55	70	650	M18	8F,9M
17	1024x8	**93450**	PROM,OC	30	20	45	60	550	M21	4R,6M,9N
18	1024x8	**93451**	PROM,3S	30	20	45	60	550	M21	4R,7L,9N
19	1024x8	**93454**	ROM,OC	30	20	45	60	550	M12	4R,6M,7L,9N
20	1024x8	**93464**	ROM,3S	30	20	45	60	550	M12	4R,6M,7L,9N
ECL										
21	256x4	**10416**	PROM	15	4.0	25 (2)	—	650	M19	4B,6D
22	256x4	**100416**	PROM	15	4.0	25 (2)	—	650	M19	4B,6D

1. OC = open collector, 3S = 3-state
2. −30°C to +85°C

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READ ONLY MEMORIES

MOS/CMOS ROMs, EPROMs AND CHARACTER GENERATORS

Item	Organization	DEVICE NO.	Description	Access Time ns (Max)	Power Dissipation mW (Max)	Temperature (1)	No. of Pins	Logic/Connection Diagram	Package(s)
MOS									
1	64x5x7	**3257**	Character Generator	1000	715	C	24	M28	7M
2	64x7x5	**3258**	Character Generator	800	500	C	16	M29	6Z
3	64x9x7	**3260**	Character Generator	1000	660	C	24	M30	7M
4	512x8	**35141**	ROM	850	580	C	24	M33	7M
5	512x8	**35142**	ROM	1000	580	C	24	M33	7M
6	512x8	**35151**	ROM	600	510	C	24	M33	7M
7	512x8	**35152**	ROM	700	510	C	24	M33	7M
8	1024x8	**F2708**	EPROM	450	800	C,L,M	24	M31	QA
9	1024x8	**F27081**	EPROM	350	800	C,L	24	M31	QA
10	1024x8	**F3508**	ROM	450	330	C	24	M32	7M
11	2048x8	**F3516E**	ROM	450	330	C	24	M34	7M
CMOS									
12	256x8	**4735B**	ROM	152(3)	0.7(3)	C,M	24	M47	4M,6Q,9U

1. C = Commercial temperature range; L = Limited military temperature range; M = Military temperature range
2. To be announced
3. Typical value at V_{DD} = 10V

SERIAL MEMORY

FIFOs, LIFOs AND SHIFT REGISTERS

Item	Organization	DEVICE NO.	Description	Frequency MHz (Max)	Power Dissipation mW (Max)	Temperature(1)	No. of Pins	Logic/Connection Diagram	Package(s)
MOS									
1	32x6	**3348**	Static Shift Register	1.0	150	C	24	M36	7M
2	32x6	**3349**	Static Shift Register	1.0	150	C	16	M37	6Z,8K,9B
3	64x4	**3341**	FIFO	0.7	450/625(2)	C,L,M	16	M38	6Z,8K
4	64x4	**3341A**	FIFO	1.0	450	C	16	M38	6Z,8K
5	64x4	**3342**	Static Shift Register	1.5	380	C	16	M35	6Z,8K,9B
6	80x4	**3347**	Static Shift Register	1.5	380	C	16	M35	6Z,8K,9B
7	80x4	**33571**	Static Shift Register	4.0	375	C	16	M35	6Z
8	80x4	**33572**	Static Shift Register	2.0	285	C	16	M35	6Z
9	40x9	**33511**	FIFO	2.0	420	C	28	M39	8E
10	40x9	**35512**	FIFO	1.0	520	C,L,M	28	M39	8E
11	16x4Kx1	**F464-2**	CCD Dynamic Shift Register	1.0(4)-5.0	336/66(3)	C	16	M27	QB
12	16x4Kx1	**F464-3**	CCD Dynamic Shift Register	1.0(4)-4.0	336/66(3)	C	16	M27	QB
13.	16x4Kx1	**F464-4**	CCD Dynamic Shift Register	1.0(4)-2.0	336/66(3)	C	16	M27	QB
CMOS									
14	16x4	**4703B**	FIFO	5.3	0.5	C,M	24	M48	4M,6Q,9U
15	16x4	**4706B**	LIFO	5.3	0.5	C,M	24	M49	4M,6Q,9U
TTL									
16	16x4	**9403**	FIFO	10	850	C,M	24	M51	6Q,9U
17	16x4	**9406**	LIFO	10	800	C,M	24	M52	6Q,9U

1. C = Commercial temperature range; L = Limited military temperature range; M = Military temperature range
2. Military and limited military temperature range
3. Standby power
4. Minimum frequency specification

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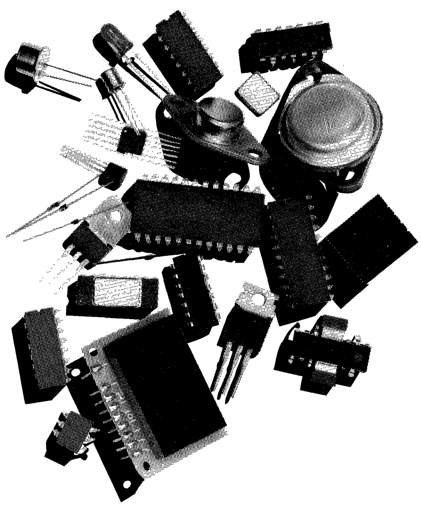


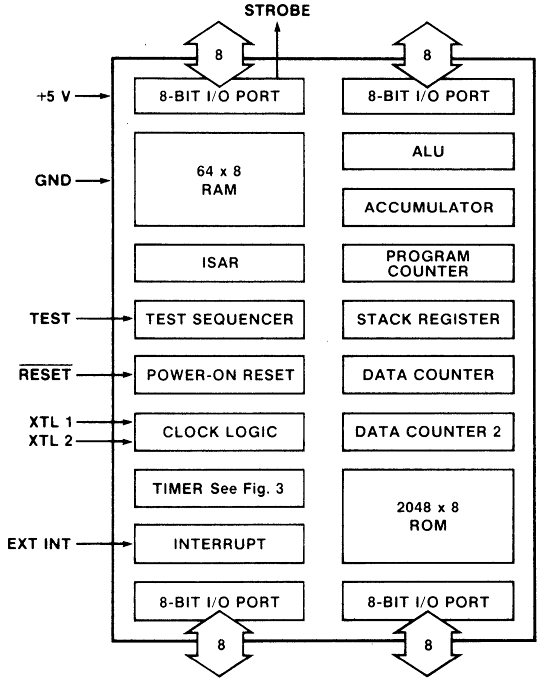
MICROMACHINE™ SERIES

MICROMACHINE™

MicroMachine™ devices are complete 8-bit microcomputers on single MOS integrated circuits. The family can execute the F8 instruction set of more than 70 commands, allowing expansion into multi-chip configurations with software compatibility. The devices feature read only memory, 64 bytes of scratchpad RAM, a programmable binary timer, 32 bits of I/O, and a single +5 V power supply requirement.

Members of the family differ in memory type and size. The F3870 has 2048 bytes of mask programmed ROM while the F38E70 has 2048 bytes of PROM. The F3872 has 3K bytes of masked ROM plus 64 bytes of RAM. The additional RAM is addressed from the program and data counters, not the ISAR. The F3874 contains 4096 bytes of masked programmed ROM.

Utilizing ion-implanted, n-channel silicon-gate technology and advanced circuit design techniques, Fairchild's single-chip microcomputers offer maximum cost effectiveness in a wide range of control and logic replacement applications.



DEVELOPMENT SUPPORT

The Formulator family of development equipment supports the F3870, the one-chip micromachine manufactured by Fairchild. The Formulator Operating System, Utility Programs, and the Fairbug Monitor are totally compatible with the F3870, since it shares the same instruction set with the Formulator. A Simulation (Quad I/O) Module and an In-Circuit Emulation (ICE) cable are available to extend the Formulator features to the user's prototype or production breadboard. This creates a powerful design tool for creating the user's own F3870 software. In addition, the F3870 Emulator, a single stand-alone module for emulating the final F3870 software in PROMs, is available for building prototype systems.

F3870 SIMULATION

The non-microprocessor elements of the user's hardware configuration can be assembled on a breadboard and connected to Mark I, II, IIFD, III or IIIFD via the ICE cable plugged into a 40-pin socket on the user's board. The cable connector on the Processor Module in the Formulator provides I/O ports 0 and 1, while the Simulation (Quad I/O) Module provides I/O ports 4 and 5. This system provides real-world simulation of the user's components in their actual environment with the vital microprocessor signals, including the complete software debugging features of the Formulator, cabled to the external breadboard.

F3870 EMULATOR

After F3870 ROM codes are frozen, a smaller, easier-to-handle and less expensive tool is required. To accomplish this design-in task, Fairchild has developed the F3870 Emulator. The F3870 Emulator contains sockets for two 2708s or two 2716 EROMs in place of the F3870 on-chip ROM so ROM codes can be verified and easily changed. The F3870 Emulator plugs directly into the F3870 40-pin socket in the production prototype using a short Emulator cable. The printed circuit module is approximately 5" by 7".

MICROMACHINE™ SERIES

FEATURES

FUNCTION	F3870 Micro-Machine	F38E70* Micro-Machine	F3872* Micro-Machine	F3874* Micro-Machine
Arithmetic Unit	Yes	Yes	Yes	Yes
Accumulator	Yes	Yes	Yes	Yes
64-byte Scratchpad RAM	Yes	Yes	Yes	Yes
Power On Detect	Yes	Yes	Yes	Yes
Clock Circuits	Yes	Yes	Yes	Yes
Interrupt Logic	Yes	Yes	Yes	Yes
Instruction Register	Yes	Yes	Yes	Yes
I/O Ports (8 lines each)	4	4	4	4
ROM (K bytes)	2K	—	3K	4K
EROM (K bytes)	—	2K	—	—
64-byte RAM	—	—	Yes	—
Program Counter	Yes	Yes	Yes	Yes
Stack Register	Yes	Yes	Yes	Yes
Data Counters	2	2	2	2
Programmable Timer	Yes	Yes	Yes	Yes
External Interrupt	Yes	Yes	Yes	Yes
Pulse Width Measure	Yes	Yes	Yes	Yes
Event Counter	Yes	Yes	Yes	Yes
Vectured Interrupts	Yes	Yes	Yes	Yes
+5V required	Yes	Yes	Yes	Yes
Power mW (Typ)	275	325	310	285
Maximum # in system	1	1	1	1
Logic/Connection Diagram	P9	P9	P9	P9
Package(s)	6I,8P	—	6I,8P	6I,8P

*To be announced

Note: The F3872 has an optional power down feature that allows the 64 byte RAM to be saved with a +2 V. Supply that will dissipate 2.5 mW. Two I/O port pins are traded for this function.

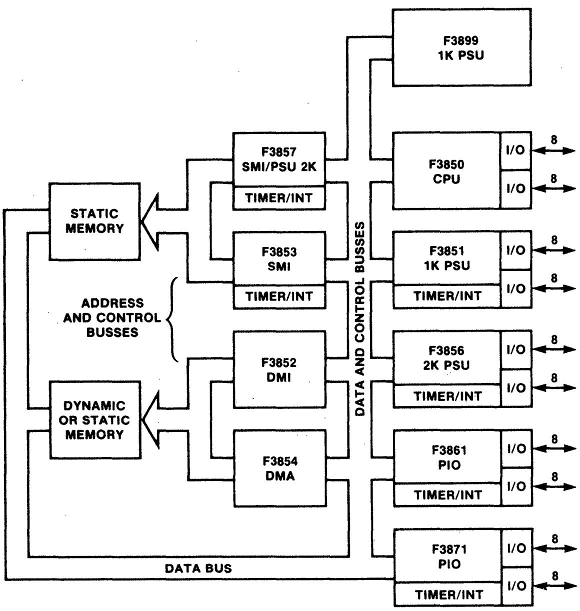
MICROCOMPUTER TRAINING COURSES

Fairchild offers training courses which are aimed at the design engineer who must learn to design the microprocessor into a working system. Both software (instruction sets) and hardware related instruction is given. Emphasis is placed on "hands-on" instruction with microprocessor development systems.

To achieve this understanding, the courses cover the details of I/O ports, use of subroutines and interrupts, where and how the ROM and RAMs are attached to the CPU and how to interface with static or dynamic memories.

Two separate four day courses are offered. One covers the F8 device family and the Micromachine series hardware and software design. The other course covers the F6800 device family in the same manner. An optional fifth day allows instruction in the alternate microprocessor.

F8 MICROPROCESSOR FAMILY



F8 MICROPROCESSOR FAMILY

FEATURES

FUNCTION	F3850 CPU	F3851 PSU	F3852 DMI	F3853 SMI	F3854 DMA	F3856 PSU	F3857 PSU/SMI	F3861 PIO	F3871 PIO	F3899 ROM
Arithmetic Unit	Yes									
Accumulator	Yes									
64-byte Scratchpad RAM	Yes									
Power on Detect	Yes									
Clock Circuits	Yes									
Interrupt Logic	Yes	Yes		Yes		Yes	Yes	Yes	Yes	
Instruction Register	Yes									
I/O Ports (8 lines each)	2	2				2		2	2	
ROM (K bytes)		1K				2K	2K			1K
Data Bus (8 lines)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Address Bus (16 lines)			Yes	Yes	Yes		Yes			
Control Bus (5 lines)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Program Counter		Yes	Yes	Yes		Yes	Yes			Yes
Stack Register		Yes	Yes	Yes		Yes	Yes			Yes
Data Counters		1	2	2		2	2			1
Programmable Timer		Yes		Yes		Yes	Yes	Yes	Yes	
External Interrupt		Yes		Yes		Yes	Yes	Yes	Yes	
Pulse Width Measure						Yes	Yes		Yes	
Event Counter						Yes	Yes		Yes	
Vectured Interrupts		Yes		Yes		Yes	Yes	Yes	Yes	
Memory Refresh Control			Yes							
DMA Control			Yes		Yes					
+5V required	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
+12V required	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power mW (Typ)	330	270	330	330	280	785	785	270	270	270
Maximum # in System	1	63	1	1	4	31	1	62	62	63
Logic/Connection Diagram	P1	P2	P3	P4	P5	P6	P7	P2	P6	P8
Package(s)	6I,8P	6I,8P	6I,8P	6I,8P	6I,8P	6I,8P	6I,8P	6I,8P	6I,8P	6I,8P

Number of ports in System is limited by addressing. The maximum is 256 Port Adresses (each F8 device uses 4 Port Addresses). Maximum memory is 64K bytes RAM/ROM/PROM.

The F38T56 and F38T57 incorporate the F3871-type of timer logic and strobe logic. These devices will be available 3rd quarter 1978.

PORT ADDRESSING

F8 MICROPROCESSOR FAMILY

Item	DEVICE NO.	PORT A ADDR.	PORT A FUNC.	PORT B ADDR.	PORT B FUNC.	PORT C ADDR.	PORT C FUNC.	PORT D ADDR.	PORT D FUNC.	TIMER INTERRUPT VECTOR ADDRESS	PORT TYPES
1	**F3850**	0	I/O	1	I/O						Standard
2	**F3851**	XXXXXX00	I/O	XXXXXX01	I/O	XXXXXX10	Control	XXXXXX11	Timer	Mask Option	Mask Option
3	**F3851A**	4	I/O	5	I/O	6	Control	7	Timer	H'0020'	Standard
4	**F3852**	H'OC'		H'OD'	Control	H'OE'		H'OF'			
5	**F3852/ SL31116**	H'EC'		H'ED'	Control	H'EE'		H'EF'			
6	**F3853**	H'OC'	Interrupt Vector Addr. Lo	H'OD'	Interrupt Vector Addr.Hi	H'OE'	Control	H'OF'	Timer	Software Programmable	
7	**F3854**	1111YY00	DMA Mem. Addr. Lo	1111YY01	DMA Mem. Addr. Hi	1111YY10	Control Hi Count	1111YY11	Lo Count		
8	**F3856**	XXXXXX00	I/O	XXXXXY01	I/O	XXXXXX10	Control	XXXXXX11	Timer	Mask Option	Mask Option
9	**F38T56**	XXXXXX00	I/O	XXXXXY01	I/O	XXXXXX10	Control	XXXXXX11	Timer	Mask Option	Mask Option
10	**F3856A**	8	I/O	9	I/O	H'OA'	Control	H'OB'	Timer	H'0024'	Standard
11	**F3857**					XXXXXX10	Control	XXXXXX11	Timer	Mask Option	Mask Option
12	**F3861A**	4	I/O	5	I/O	6	Control	7	Timer	H'0600'	Standard
13	**F3861B**	8	I/O	9	I/O	H'A'	Control	H'B'	Timer	H'0340'	Standard
14	**F3861C**	H'20'	I/O	H'21'	I/O	H'22'	Control	H'23'	Timer	H'0320'	Standard
15	**F3861D**	H'24'	I/O	H'25'	I/O	H'26'	Control	H'27'	Timer	H'0360'	Standard
16	**F3861E**	4	I/O	5	I/O	6	Control	7	Timer	H'0020'	Standard
17	**F3871E**	4	I/O	5	I/O	6	Control	7	Timer	H'0020'	Standard
18	**F3871F**	4	I/O	5	I/O	6	Control	7	Timer	H'0020'	Direct Drive
19	**F3871G**	4	I/O	5	I/O	6	Control	7	Timer	H'0020'	Open Drain
20	**F3871H**	4	I/O	5	I/O	6	Control	7	Timer	H'0420'	Standard

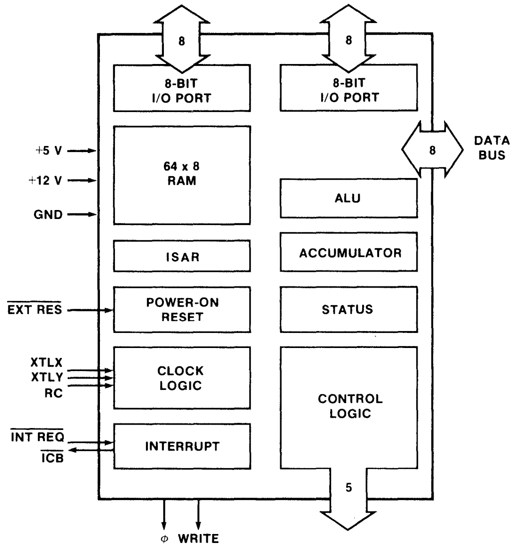
1. XXXXXX is a Mask Option
2. YY is a Pin Strap Option (1111YY00)
3. The External Interrupt Address Vector is the Timer Address + H'0080'
4. Three different types of timers and control ports exist. For further detail see Figures 1, 2, and 3.
5. F38T56 and F38T57 have F3871-type timer and strobe logic.

F8 MICROPROCESSOR FAMILY

F3850 CENTRAL PROCESSING UNIT (CPU)

The CPU is an 8-bit arithmetic device with 70 instructions. It contains a 64-byte RAM, an instruction register, an accumulator, two parallel I/O ports, an interrupt control, power on reset and clock generation logic. The CPU provides communication control lines to the other members of the family.

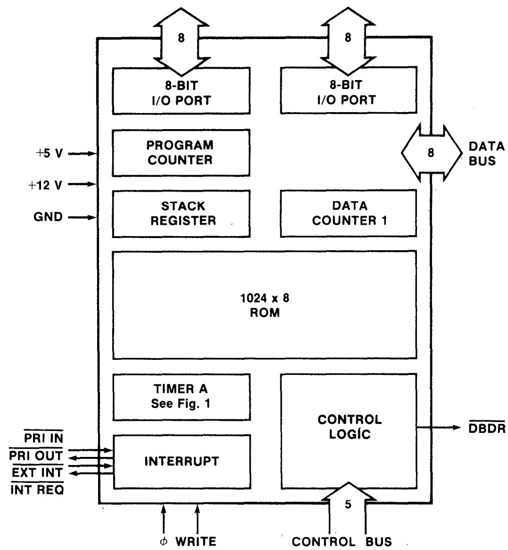
The F8 offers several alternatives for connecting memory to the system. These may be used individually, or in various combinations, depending upon the requirements.



F3850 CPU

F3851 PROGRAM STORAGE UNIT (PSU)

The F3851 PSU contains 1024 bytes of mask programmable ROM, a program counter and a data counter. It also has two parallel I/O ports, an 8-bit data port, a stack register, an incrementer/adder, a programmable timer and an interrupt control. Several F3851 circuits may be put in one system, thus increasing the ROM, I/O, and interrupt capability of the system. The F3851 program storage unit may be used alone, or in combination with one of the memory interface circuits.

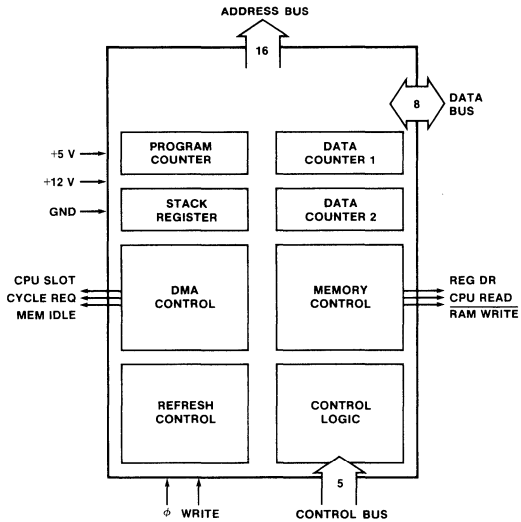


F3851 PSU

F8 MICROPROCESSOR FAMILY

F3852 DYNAMIC MEMORY INTERFACE (DMI)

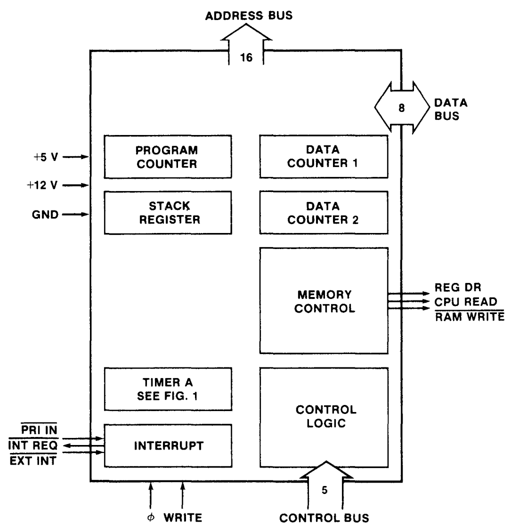
The DMI provides an appropriate interface for either static or dynamic memory components. When dynamic RAM circuits are used the DMI provides the necessary refresh controls required to maintain memory integrity. Another function of the DMI is to provide control for the F3854 DMA circuit. The dynamic memory refresh cycles and the DMA transfers are performed without slowing the central processor. The DMI also contains a program counter, data counter, an auxiliary data counter, stack register, incrementer/adder, an 8-bit data bus and a 16-bit address bus for communication with external memory. The DMI may be used solely with the CPU, or in conjunction with the F3851 PSU device.



F3852 DMI

F3853 STATIC MEMORY INTERFACE (SMI)

The SMI is the second of three alternative devices in the F8 family which may be used with the 3850 CPU for memory interface. The SMI provides the necessary control for static memory components such as the 2102 RAM, 2708 EPROM, or 93448 PROM. The SMI also contains a program counter, data counter, an auxiliary data counter, stack register, incrementer/adder, a programmable timer, an 8-bit data bus and a 16-bit address bus for communication with external memory. The F3853 may be used solely with the CPU, or in conjunction with F8 PSU devices.



F3853 SMI

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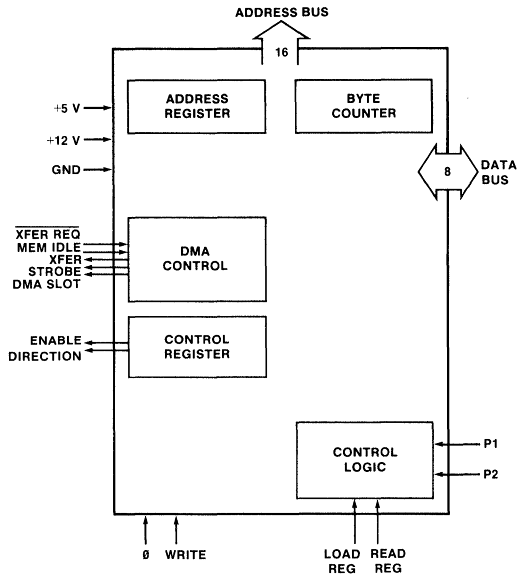
F8 MICROPROCESSOR FAMILY

F3854 DIRECT MEMORY ACCESS UNIT (DMA)

The DMA circuit allows memory access from an external device during periods when the CPU is not using the memory. The F3852 DMI provides a control line which indicates periods when the memory is idle. During these periods the DMA transfers data between an external device and the memory. This operation is performed without slowing the central processor. In addition, the DMA contains a 16-bit memory address bus, an 8-bit data bus, programmable address vector and data length counter.



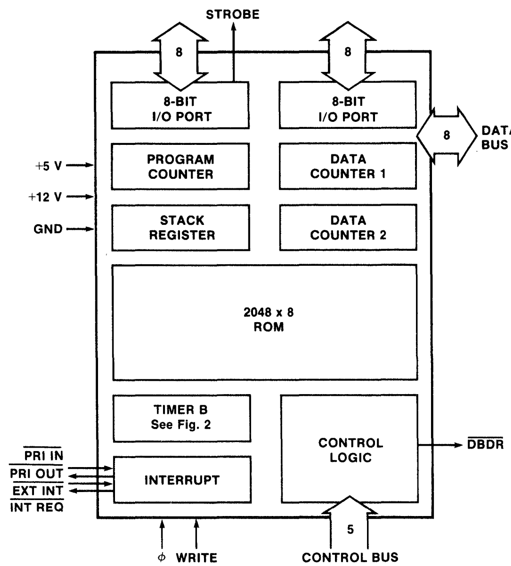
F3854 DMA

F3856 PROGRAM STORAGE UNIT (PSU)

It is important to note that Fairchild's program storage unit is not just a conventional read only memory. In addition to containing 2048 bytes of mask programmable ROM for program and constant storage, the F3856 includes the addressing logic for memory referencing, a program counter, an indirect address register (the data counter) and a stack register. A complete vectored interrupt level, including an external interrupt line to alert the central processor, is provided. All of the logic necessary to request, acknowledge and reset the interrupt is on the F3856. The 8-bit programmable timer is especially useful for generating real time delays. The PSU has an additional 16 bits of TTL compatible, bidirectional, fully latched I/O lines.

Systems requiring more program storage may be expanded by adding more PSU circuits. For example, one F3850 and two F3856 PSUs will produce a microprocessor system complete with 64 bytes of RAM, 4096 bytes of ROM, 48 I/O bits, two interrupt levels, and two programmable timers. This complete system will require only three IC packages.

The F38T56 incorporates the F3871-type timer and strobe logic.



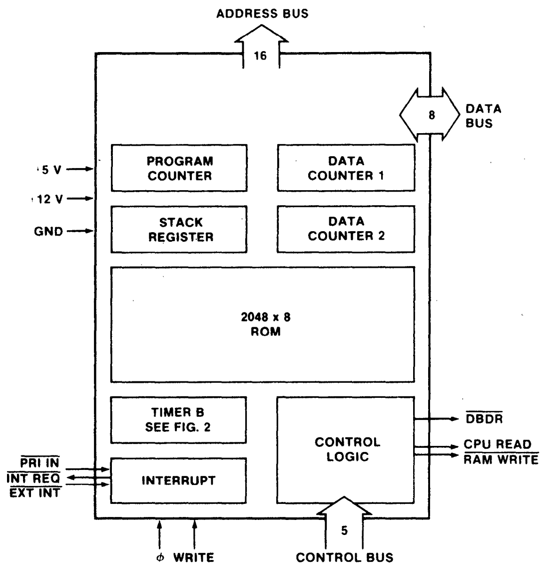
F3856 PSU

F8 MICROPROCESSOR FAMILY

F3857 PROGRAM STORAGE UNIT/STATIC MEMORY INTERFACE (PSU/SMI)

The F3857 is the third alternative device in the F8 family which may be used with the F3850 CPU for memory interface. The PSU/SMI provides the necessary control for static memory components such as the 2102 RAM or F2708 EPROM. The PSU/SMI also contains a program counter, data counter, an auxiliary data counter, stack register, incrementer/adder, a programmable timer, an 8-bit data bus and a 16-bit address bus for communication with external memory. The F3857 may be used solely with the CPU, or in conjunction with other members of the F8 family. The F3857 differs from the F3853 in that a 2048 byte mask programmable ROM is also included.

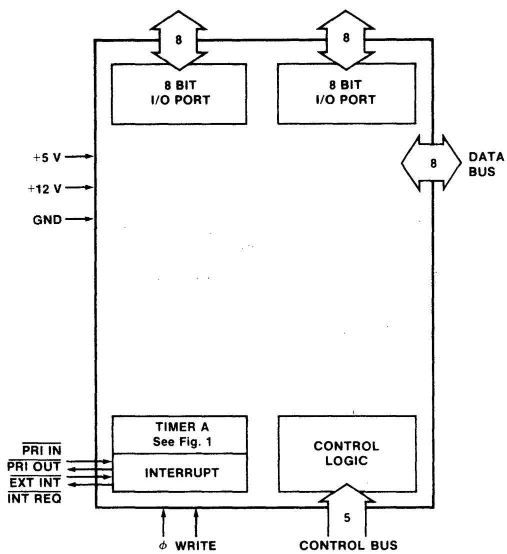
The F38T57 incorporates the F3871-type timer and strobe logic.



F3857 PSU/SMI

F3861 PERIPHERAL I/O DEVICE (PIO)

The PIO is an expansion unit for I/O ports, interrupts and timers. It contains two 8-bit I/O ports, one interrupt control, and one programmable timer. Depending on the application requirements, multiple PIOs may be added to the system to expand the functions at low cost.

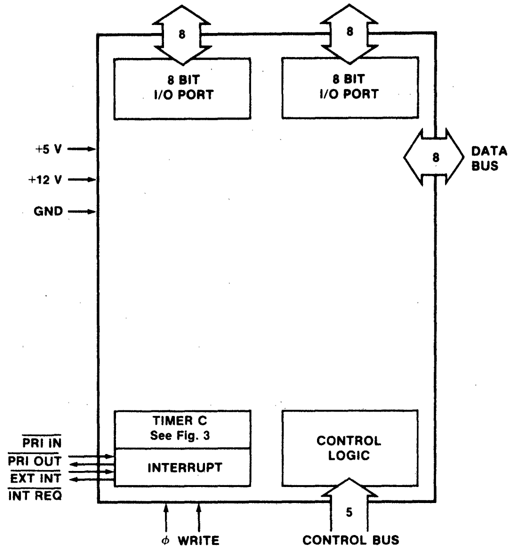


F3861 PIO

F8 MICROPROCESSOR FAMILY

F3871 PERIPHERAL I/O DEVICE (PIO)

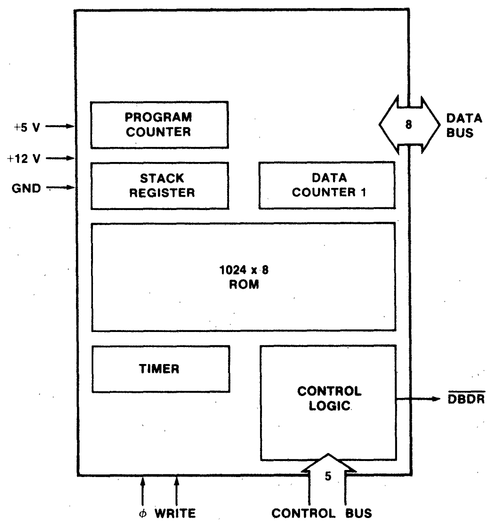
The PIO is an expansion unit for I/O ports, interrupts and timers. It contains two 8-bit I/O ports, one interrupt control, and one programmable timer. Depending on the application requirements, multiple PIOs may be added to the system to expand the functions at low cost. The versatile timer/interrupt circuit has the ability to measure external pulse widths, or count external pulses in addition to providing a timer with resolution of 1.0μs at 2.0MHz.



F3871 PIO

F3899 PROGRAM STORAGE UNIT (PSU)

The F3899 PSU contains 1024 bytes of mask programmable ROM, a program counter, stack register, and a data counter. The F3899 provides a low cost ROM memory to augment the F8 family.



F3899 PSU

MICROMACHINE™ SERIES AND F8 FAMILY TIMERS

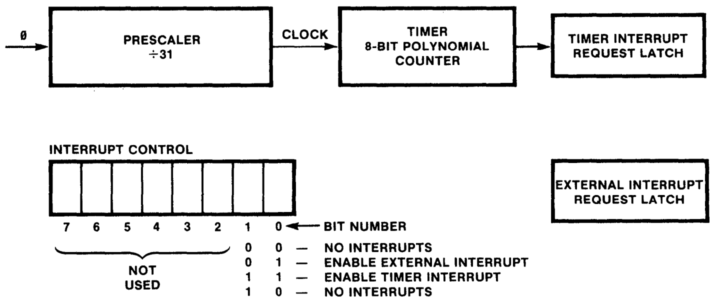


Fig. 1 Timer and Interrupt Control for F3851, F3853 and F3861

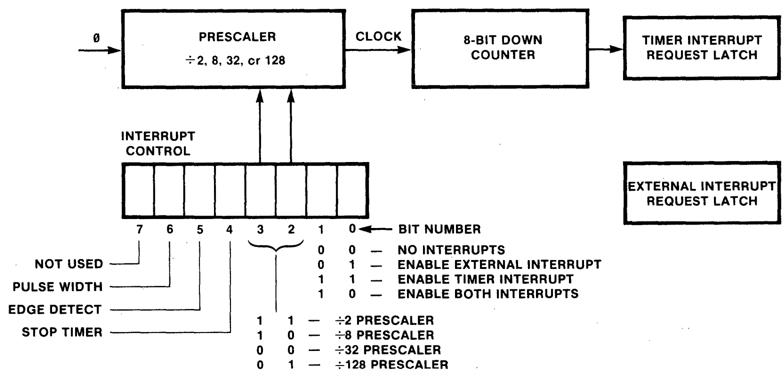


Fig. 2 Timer and Interrupt Control for F3856 and F3857

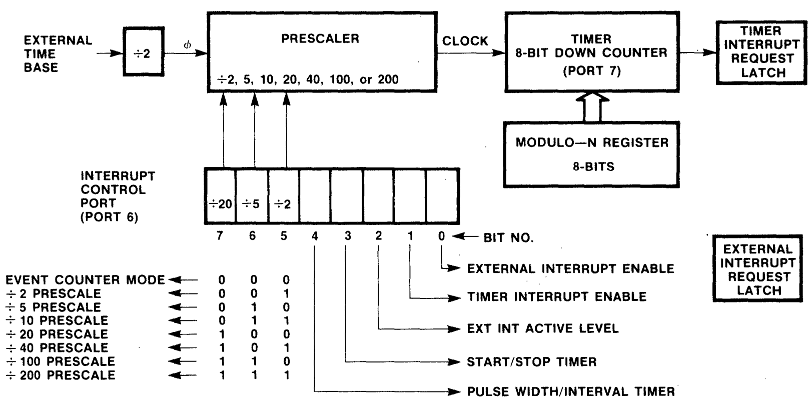


Fig. 3 Timer and Interrupt Control for F3870 and F3871

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MICROMACHINE™ SERIES AND F8 FAMILY DESIGN AIDS

The microprocessor system designer can now create his own hardware and software development systems by selecting modular subassemblies from Fairchild's Formulator design aids. He may start development with a Mark I singleboard system, then expand to more sophisticated Mark II or Mark IIFD development systems that can handle both software and hardware development. Or, he may graduate to a complete Formulator Mark III with intelligent front panel, power supply, and accessories or to the top of the line Formulator Mark IIIFD with floppy disk drives.

Three growth packages plus a selection of optional modules provide a practical method for upgrading the single-board Mark I to either the Mark II or Mark IIFD or to the maximum system configuration Mark III or Mark IIIFD. Using the growth packages, the designer can begin sophisticated system application programs at very low cost and then upgrade his development tools in relatively inexpensive steps.

FORMULATOR MARK I

The first member of the Formulator family, the Formulator Mark I, is a basic microcomputer development tool providing the hardware necessary to build prototype systems. Included in the basic system is the Formulator Processor Module with the F8 CPU, Static Memory Interface, Dynamic Memory Interface, and Program Storage Unit devices. The Fairbug debug program, a 1K-byte monitor debug package, is included in the Program Storage Unit on the Processor Module. Fairbug provides the Mark I with sufficient debug capability to load a program, examine registers, monitor and alter memory locations, store a program on an external file, and generate a tape suitable for burning PROM memory devices. The Mark I also comes equipped with a 13-slot card cage and motherboard for attaching the modular Formulator printed circuit boards. Cables and documentation are also included in the F8 Formulator Mark I system, including a peripheral interface cable which can connect the Mark I to a Teletype ASR33 or TI Silent 733 for external communication.

Hardware
- Formulator Processor Module
- Formulator Card Cage and Motherboard
- Processor Module to Peripheral Cable
- Power Cable
- Cable Kit

Software
- Fairbug Debug Program

Documentation
- Formulator User's Guide
- Formulator Hardware Reference Manual
- Formulator Mark I Systems Coverage Manual
- Formulator Utilities Manual

FORMULATOR MARK II

The second member is the Formulator Mark II. This unit is a low cost microcomputer software and hardware development tool. It includes the basic hardware required to develop a system, as well as the necessary software tools to develop object code. The Mark II consists of all the components of the Mark I, namely the Processor Module, card cage and motherboard, cable kit, and the Fairbug debug program, as well as an additional 16K-byte RAM module. Also a part of the Mark II is the Formulator Operating System, including the editor, relocating assembler, and debug package to allow the generation of source code and to create and check out object code. Peripheral interfaces are also available to connect the Mark II to a TI Silent 733 or Teletype ASR33.

Hardware
- Formulator Processor Module
- 16K-Byte RAM Module
- Formulator Card Cage and Motherboard
- Processor Module to Peripheral Cable
- Power Cable
- Cable Kit

Software
- Formulator Operating System

Documentation
- Formulator User's Guide
- Formulator Hardware Reference Manual
- Formulator Mark II Systems Coverage Manual
- Formulator Utilities Manual

MICROMACHINE™ SERIES AND F8 FAMILY DESIGN AIDS

FORMULATOR MARK IIFD

The third member is the Formulator Mark IIFD, a floppy-disk based low-cost microcomputer software and hardware development tool. It includes the basic hardware required to develop a system, as well as the necessary software tools to develop programs. The Mark IIFD consists of all the components of the Mark I, namely the Processor Module, card cage and motherboard, cable kit, and the Fairbug debug program, as well as an additional 16K-byte RAM Module. The F8-DOS-III is also a part of the Mark IIFD. It includes a floppy-disk file manager, editor, relocating assembler, and debug package to generate source code and to create and check out object code. The Mark IIFD can communicate with teletype ASR33 and other standard RS232 CRT or printing terminals.

Hardware
- Parallel Interface Module
- Prom Boot Loader Module
- Formulator Processor Module
- 16K-Byte RAM Module
- Formulator Card Cage and Motherboard
- Processor Module to Peripheral Cable
- Power Cable
- Cable Kit

Software
- F8-DOS-III Floppy Disk Operating System

Documentation
- Formulator User's Guide
- Formulator Hardware Reference Manual
- Formulator Mark II Systems Coverage Manual
- Formulator Utilities Manual

FORMULATOR MARK III

The fourth level of microprocessor development equipment is the Formulator Mark III, offering all of the design assistance required to develop microprocessor systems. The combination of hardware, software, and firmware offered by the Mark III assists the designer from the generation of source programs through the development of a prototype system. The Mark III is a modular microcomputer that accommodates a variety of memory, input/output, and communication configurations to form a new and powerful development system. It contains all of the components of the Mark II—the Processor Module, card cage and motherboard, cable kit, the Fairbug debug program, 16K bytes of RAM, and the Formulator Operating System. In addition, the Mark III includes a Quad I/O Module with four I/O ports and two interrupts, a Communications Module with an on-board UART, a universal breadboard for building user hardware configurations, an extender module, and an intelligent operator's panel. Power supplies for the Mark III may be either 100 volts, 115 volts, or 220 volts at 50/60Hz. Peripheral interfaces are available to connect the Mark III with a TI Silent 733, a Teletype ASR33, or an HP 2645A Mini-Data Station.

Hardware
- Formulator Mainframe
- Designer's Console with Firmware
- Formulator Processor Module
- 16K-Byte RAM Module
- Quad I/O Port Module
- Communications Module
- Universal Breadboard
- Extender Module
- Cable Kit
- User I/O Cable Assembly
- Communications Module to Peripheral Cable

Software
- Fairbug Debug Program
- Formulator Operating System

Documentation
- Formulator User's Guide
- Formulator Hardware Reference Manual
- Formulator Mark III Systems Coverage Manual
- Formulator Utilities Manual

FORMULATOR MARK IIIFD

The top of the line in microprocessor development equipment is the floppy-disk-based Formulator Mark IIIFD, offering all of the design assistance required to develop microprocessor based systems. The combination of hardware, software, and firmware offered by the Mark IIIFD assists the designer from the generation of source programs through the development of a prototype system. The Mark IIIFD is a modular microcomputer that accommodates a variety of memory, input/output, and communication configurations to form a new and powerful development system. It contains all of the components of the Mark IIFD, the Processor Module, card cage and motherboard, cable kit, the Fairbug debug program, parallel interface, PROM boot loader, 16K bytes of RAM, and the F8-DOS-III disk operating system. In addition, the Mark IIIFD includes a quad I/O module with four I/O ports and two interrupts, a communications module with an on-board UART, a universal breadboard for building user hardware configurations, an extender module, and an intelligent operator's panel. Power supplies for the Mark IIIFD may be either 100 volts, 115 volts or 220 volts at 50/60Hz. The Mark IIIFD can communicate with teletype ASR33 or other standard RS232 glass or printing terminals.

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MICROMACHINE™ SERIES AND F8 FAMILY DESIGN AIDS

FORMULATOR MARK IIIFD (Cont'd)

Hardware

- Formulator Mainframe
- Designer's Console with Firmware
- Formulator Processor Module
- Parallel Interface Module
- PROM Boot Loader Module
- 16K-Byte RAM Module
- Quad I/O Port Module
- Communications Module
- Universal Breadboard
- Extender Module
- Cable Kit
- User I/O Cable Assembly
- Communications Module to Peripheral Cable

Software

- F8-DOS-III Floppy Disk Operating System

Documentation

- Formulator User's Guide
- Formulator Hardware Reference Manual
- Formulator Mark III Systems Coverage
- Formulator Utilities Manual

F8-DOS-III DESCRIPTION

The Formulator F8-DOS-III operating system provides floppy-disk bulk storage capability for Fairchild's Formulator Mark IIFD and Mark IIIFD F8 microcomputers when used with up to four plug-compatible iCOM® series FD 360, FD3700 and Frugal Floppies™ providing for over one megabyte of total storage capacity.

F8-DOS-III provides a powerful and complete development software package with batch operation, linking loader, and relocating assembler, and provides an easy to use, reliable, fast and extremely efficient capability for auxiliary program and data storage during F8 and F3870 software development or in end-user applications.

iCOM® Advertised	F8-DOS-III SUMMARY			
FD3700 Series Features	**Disk Monitor**	**Editor**	**Relocating Assembler**	**Real-Time Debugger**
Fully IBM 3740 media and	Assemble	Move Line	No-List Option	Symbolic Debugging
format compatible	(Relocating)	Copy Line	No-Object Option	Set Up to 8 Breakpoint
Full formatter and controller	Load (Linking)	Bottom	Error Messages	Clear Breakpoint
built-in	List Directory	Change	Invalid Label	Clear All Breakpoints
Full sector Read/Write buffers	Print File	Delete	Duplicate Label	Continue Execution
allow asynchronous or DMA	Rename File	File	Invalid Op Code	Go To Location
data transfer	Create File	Find String	Operand Error	Return to Monitor
Drive and diskette Write Pro-	Delete File	Insert	Syntax Error	Single Step
tect capability	Copy File	Locate String	Undefined Symbol	Trace On Long
Positive latching door	Copy Disk	Next	Expression Storage	Trace On Short
mechanism	GenMod	Replace	Overflow	Trace Off
Up to 4 drives with no soft-	(Created	Tab	Relocatability	Display Memory
ware or hardware modifi-	Linked File)	Top	Error	Display Register
cations	Edit Mode			
MTBF in excess of 2300 hours		Type	Pseudo Operand	Display Port
(FD 3712 dual drive)	Load (Absolute)	Up	Error	Store Memory
Plug-in convenience allows	DeBug Mode		Cross Reference	Store Register
MTTR of 18 minutes	Assign Virtual I/O			Store Port
Front panel LED status	Burn PROM			
indicators	Convert			
LED drive select indicators	ROM Dump			
Fully retracting head and				
pressure pad for maximum				
diskette life				
50 pin flat ribbon cable with				
3M interface connector—				
FD 360 compatible				

MICROMACHINE™ SERIES AND F8 FAMILY DESIGN AIDS

FORMULATOR GROWTH PACKAGES

The Mark I, Mark II, and Mark III Formulator systems previously described are all upwards compatible. The Mark I can be expanded to become a Mark II; likewise, the Mark II may be developed into a Mark III. In addition, a Mark II can be expanded to a Mark IIFD and a Mark III into a Mark IIIFD. This means that a microprocessor system designer may enter the microcomputer design at a level which best matches the needs at hand—amount of available money, time, microprocessor experience—and be able to increase the Formulator's capabilities as his needs grow. Three growth packages are available to Formulator product owners. Growth Package 1 converts a Mark I system to a Mark II; Growth Package 2 extends the capabilities of the Mark II into the Formulator Mark III, and Growth Package 3 extends a Mark II or III into a Mark IIFD or IIIFD.

Growth Package I

- 16K-Byte RAM Module
- Mark II Formulator Operating System

Growth Package 2

- Quad I/O Module
- Communications Module
- Power Supply
- Fan
- Console Control Modules
- Internal Cable Wiring
- Universal Breadboard
- Extender Module
- I/O Cable Assembly
- Communications Module to Peripheral Cable
- Mark III Formulator Operating System

Growth Package 3

- Parallel Interface Module
- PROM Boot Loader Module
- F8-DOS-III System Diskette

PERIPHERAL OPTIONS

The Formulator Mark II systems interface with either a Teletype ASR33 with the auto read/auto punch option or a TI Silent 733 ASR with the ADC option. The teletype terminal provides a paper tape based system, while the 733 allows file storage on magnetic tape cassettes. To decrease load times, a Remex high speed paper-tape reader (or equivalent) may be used with either peripheral unit.

The Formulator Mark III provides an interface for the HP Mini-Data Station as well. This high speed unit combines the efficiency of the magnetic tape cartridges with an intelligent terminal and thermal line printer to allow the rapid development and debugging of application programs.

The Formulator Mark IIFD and IIIFD systems interface with any standard RS232 terminal and printer or printing terminal to offer maximum peripheral cost/speed flexibility.

HP MINI-DATA STATION

The HP 2645A Mini-Data Station features an interactive CRT Terminal with high resolution display and a fully integrated mass storage capability, making it easy to use both on- and off-line. It uses 2-1/2" x 3-1/4" x 1/2" magnetic cartridges which store up to 110 kilobytes of formatted data. The Mini-Data Station has two mini cartridge drives, allowing for a total of 220 kilobytes of data storage on magnetic tape. Thus, all files—both operating system and user files—are resident on the magnetic tape. Loading and storing files is accomplished by reading and writing onto the cartridge. The user's time is decreased and efficiency increased when the magnetic tapes are used.

The 2645 Mini-Data Station comes equipped with three data cartridges, an Owner's Manual, and an Installation and Service Manual.

HP 9866A PRINTER SUBSTATION

The HP 9866A line printer is a moderately priced, high performance companion to the HP 2645A Mini-Data Station, providing a permanent record of the contents of the Mini-Data Station display and memory for future use. The printer operates at up to 240 lines per minute with a maximum line width of 80 characters. The character set consists of 64 alphanumeric characters generated by a 5 x 7 dot matrix. Since a thermal printing mechanism is used to make this printer quiet enough for normal office use, thermal sensitive paper is required. This paper is 8-3/4 inches wide and available in 250 foot rolls.

The 9866A thermal printer comes equipped with two rolls of paper, a power cord, an interface card and cable, and an Instruction Manual.

MICROMACHINE™ SERIES AND F8 FAMILY DESIGN AIDS

iCOM F3712 DUAL FLOPPY DISK

The iCOM FD3700 Series Floppy Disk System for microcomputers continues the tradition of the iCOM FD360. The FD3700 brings to the OEM, and to the development lab, proven reliability and popular features, while incorporating advanced styling and new convenience items.

The iCOM FD3700 Series features the following:

- Fully IBM 3740 media and format compatible
- Full formatter and controller built in
- Full sector read/write buffers allow asynchronous or DMA data transfer
- Drive and diskette write-protect capability
- Positive latching door mechanism
- Up to four drives with no software or hardware modifications
- MTBF in excess of 2300 hours (FD3712 dual drive)
- Plug-in convenience allows MTTR of 18 minutes
- Front panel LED status indicators
- LED drive select indicators
- Fully retracting head and pressure pad for maximum diskette life
- 50-pin flat ribbon cable with 3M interface connector—FD360 compatible

iCOM Performance features are as follows:

- Disk speed 360 RPM $\pm$ 1.5%
- 10 ms track-to-track access time
- 40 ms head load time
- 5 ms sector read/write time
- 83 ms average latency time
- 700 ms automatic head unload time
- 1 ms interrecord time

Power Requirements Are:

110-125 V_{ac}, 60Hz, 200 W max
Optional 220-240 V_{ac}, 50Hz, 200 W is available

OPTIONAL FORMULATOR MODULES

Expansion of the Formulator microcomputers need not occur along the path indicated by the growth packages. Optional Formulator modules are available to expand RAM, PROM I/O, and communications, so the user can develop a custom system which is perfectly suited to his specific needs. These optional modules may be attached to the Formulator via the 13 card slots in the motherboard. The first three slots are dedicated to front panel operations of the Mark III. Another slot is reserved for the Processor Module. The remaining nine slots are linked on a common bus whose signals are compatible with the modules themselves. Additional system functions may be easily added to any Formulator system by simply plugging in one of the modules. Thus, the initial Formulator investment is preserved. Nothing needs to be discarded as demands upon the system increase. Unless otherwise noted, all of the following optional modules are available to update any Mark I, Mark II, Mark IIFD, Mark III, or Mark IIIFD system to meet expanded requirements.

Optional Modules

4K-Byte RAM Module
16K-Byte RAM Module
Quad I/O Port Module
4K-Byte PROM Module
Communications Module
Byte Parallel Interface Module
ROM Simulation Module
Universal breadboard
Extender Module
I/O Light Display Board

PROM PROGRAMMER

The ability to easily program permanent memory devices is essential to any microprocessor design. The Formulator PROM Programmer connects to a Quad I/O Module within either a Formulator Mark II or a Formulator Mark III, permitting the programming of any of the following fuseable link or ultraviolet light eraseable PROMs from a pattern stored in the Formulator memory.

The 11" x 12" x 4" PROM Programmer is driven by a utility program contained within the Formulator Operating System and features a simple, easy to use command set. The commands, entered into the PROM Programmer from the Formulator peripheral via the keyboard, allow the user to transfer data from a PROM to memory, burn a PROM, verify a PROM pattern, manually enter a single byte of data, and display PROM locations using the system software. The programming idiosyncrasies of each PROM are contained in software look-up tables to relieve the user of intricate repetitious set-up. The procedure is simply to identify the PROM type (like 93448) and the PROM parameter look-up table is automatically invoked, defining such things as number of words, word bit length, burn time, wait time, retry conditions, etc. The programming is convenient

MICROMACHINE™ SERIES AND F8 FAMILY DESIGN AIDS

PROM PROGRAMMER (Cont'd)

enough to allow the PROM Programmer to be used in a production environment.

Included in the basic system are two socket boards, one for the Fairchild 93436/93446 PROMs and one for the 93438/93448 PROMs. Socket boards for the ultraviolet eraseable devices are also available. A cable to the Quad I/O Module and a power cord are also included in the basic unit.

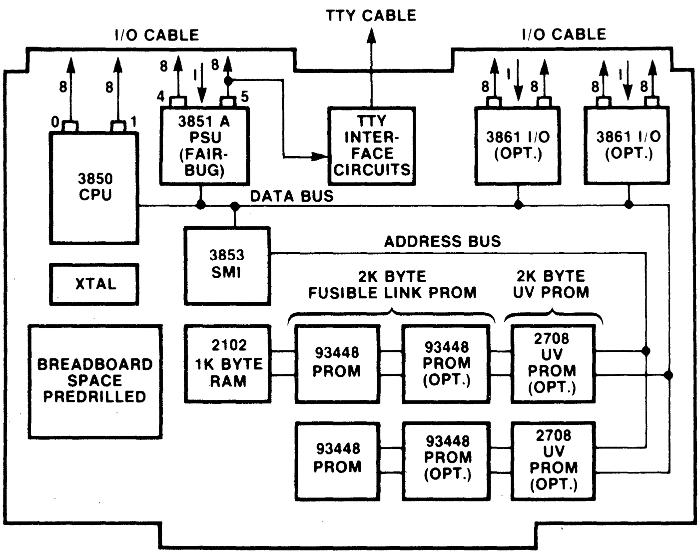
Fairchild Fusible Link PROMS	Ultraviolet Eraseable PROMs
93436 (512 x 4)	2704 (512 x 8)
93446 (512 x 4)	2708 (1024 x 8)
93438 (512 x 8)	
93448 (512 x 8)	

OCM-1 ONE-CARD MICROCOMPUTER

The OCM-1 is a complete microcomputer system contained on a single printed circuit board and offering the following features:

- 64-byte scratch pad memory
- 1K-byte RAM
- 8K-byte ROM (1K supplied, sockets provided for balance)
- 4K-byte EPROM (sockets provided)
- 4K-byte PROM (sockets provided)
- Up to four programmable timers
- Up to four programmable interrupts
- RS232 interface (current loop optional)
- 2MHz clock
- Self-contained Fairbug teletype operating system
- Up to 64 individually programmable, bidirectional, latched I/O lines.

The unit is based on the F8 microcomputer and is fully supported by the Formulator family of program development aids. In addition, the OCM-1 contains a built-in teletype operating system, called Fairbug I, contained in the F3851A Program Storage Unit. Using an OCM-1-to-TTY cable assembly, the board can be directly coupled to a teletype or RS232 terminal to display or alter memory location, to load and punch paper tape, or to make entries from the keyboard or by program instruction. An alternative built-in operating system, K-D Bug, contained in the F3856A PSU is also available. It provides all of the Fairbug I functions plus a resident monitor to facilitate operation with a low-cost calculator-style keyboard and LED display. A Fairbug user's guide is provided with the OCM-1. The K-D Bug should be ordered as a separate item.



MICROMACHINE™ SERIES AND F8 FAMILY DESIGN AIDS

ONE CARD MICROCOMPUTER (Cont'd)

The OCM-1 processor section includes the 3850 Central Processing Unit, the F3853 Static Memory Interface, a 2MHz clock, and reset circuitry.

The OCM-1 memory section contains the capability for the use of five different types of storage including 64 bytes of scratch pad, 1K bytes of RAM, sockets for 2K bytes of EROM (2708), sockets for 2K bytes of fusible link PROM (93448), and the Fairbug I operating system.

The I/O portion of the system is contained in the F3850 Central Processing Unit and a F3851A Program Storage Unit, each containing two 8-bit I/O ports. Two sockets are provided for inserting standard F8 PIO circuits (F3861 or F3871) or, if more ROM is required, standard PSUs (F3851 or F3856) may be inserted. In either case, four additional I/O ports are provided bringing the maximum total to eight I/O ports (64 lines). Only single-byte instructions are required to individually program these lines for either input or output functions. Latches on each line reduce external hardware cost. A circuit on the board gives the OCM-1 the capability of communicating with a teletype, RS232 device or 20mA current loop.

In its standard configuration, the OCM-1 contains two interrupts and two timers, one in the F3851A PSU and one in the F3853 SMI. Two additional interrupts and timers may be added by plugging the two additional PIOs into their sockets. A "daisy-chained" priority system determines which interrupt will be serviced if two or more requests are made simultaneously.

The OCM-1 requires three power supply voltages: +12V @ 0.255 A, -5V @ 0.4 A and -5V @ 0.09 A. The -5V supply is used only for the 2708 EROM devices. All supply voltages are ±5% maximum.

The entire microcomputer is contained on a single board (epoxy glass with solder mask) measuring approximately 7.5 inches by 10.5 inches. It includes a 2-inch by 4-inch pre-drilled breadboarding area for users who want to develop unique system configurations. In addition, a Formulator-compatible 100-pin edge connector, a special connector for TTY or terminal, and two 44-pin edge connectors for F8 signals, are contained on the board. A switch to enable the Fairbug operating system is also provided. The OCM-1 is delivered completed with OCM-1 Users Manual, Fairbug Users Guide and F8 Guide to Programming.

FORMULATOR SUPPORT

In addition to the optional boards, peripherals, cables, and other accessories, the Mark I, Mark II, and Mark III Formulator systems are supported by a wide range of documentation, and an intensive training program.

FORMULATOR DOCUMENTATION

The Formulator user has access to a full range of reference and instructional manuals to aid him in his system design and programming.

F8 USER'S GUIDE

The F8 User's Guide is a detailed description of the F8 family of microprocessor devices. Microprocessor systems are discussed, with the configurations of the F8 circuits examined in depth. The User's Guide also outlines the F8 instruction set. Detailed specifications of each member of the F8 microprocessor family is given, including functional descriptions, logic diagrams, signal load levels, and timing diagrams for each circuit. Typical F8 system configurations are also presented.

MICROMACHINE USER'S GUIDE

The Micromachine 2 User's Guide is a detailed description of the F3870, F38T70, F3872 and F3874 Micromachines. This manual covers programming and systems design with emphasis on application implementation.

GUIDE TO PROGRAMMING

The Guide to Programming is written for logic designers with little or no background in computer programming. It introduces machine and assembly language programming to the potential user of microprocessors and microcomputer systems. Introductory topics include flowcharting, memory allocation, source and object programs, and assembly language. More advanced topics include programmed I/O, interrupts, programmable timers, subroutines, macros, data manipulation, and programmed direct memory access channels. Numerous examples of these programming techniques are given.

FORMULATOR USER'S GUIDE

The Formulator User's Guide fully describes the operation of the Formulator Development system. It covers the Mark I, Mark II, and Mark III hardware configurations and contains a detailed description of the Formulator software—the monitor, the editor, the assembler, and the debug program. The F8 DOS-III User's Guide is also available for Mark IIFD and Mark IIIFD systems.

FORMULATOR HARDWARE REFERENCE MANUAL

This book presents an in-depth technical description of the F8 Formulator System, its component subsystems, and options. The technical description includes general functional characteristics, theory of operation, and detailed description of interface signals.

F6800 MICROPROCESSOR FAMILY

F6800 MICROPROCESSOR FAMILY

Item	DEVICE NO.	Function	Power Supply V	P_D Max (Typ) mW	Cycle Time ns	Access Time ns	Memory Size	Logic/ Connection Diagram	Package(s)
1	**F6800**	MPU, Address, Interrupt	5.0	(600)	1000			P10	6I,8P
2	**F68A00**	MPU, Address, Interrupt	5.0	(500)	667			P10	6I,8P
3	**F68B00**	MPU, Address, Interrupt	5.0	(500)	500			P10	6I,8P
4	**F6801**(1)	Single Chip Microcomputer with 128x8 RAM	5.0	(500)	500		2Kx8 (ROM)	P10	6I,8P
5	**F6802**	MPU, Address, RAM Interrupt	5.0	(600)	1000		128x8 (RAM)	P19	6I,8P
6	**F68A02**	MPU, Address, RAM, Interrupt	5.0	(600)	667		128x8	P19	6I,8P
7	**F68B02**	MPU, Address, RAM, Interrupt	5.0	600	500		128x8	P19	6I,8P
8	**F6809**(2)	MPU, Address, Interrupt	5.0		500/1K				6I,6T
9	**F6810**	Static RAM	5.0	400		460	128x8	P13	7R,9N
10	**F68A10**	Static RAM	5.0	400		360	128x8	P13	7R,9N
11	**F68B10**	Static RAM	5.0	400		250	128x8	P13	7R,9N
12	**F6820/21**	Parallel I/O 16 lines	5.0	550	1000			P11	6I,8P
13	**F68A21**	Parallel I/O 16 lines	5.0	550	667			P11	6I,8P
14	**F68B21**	Parallel I/O 16 lines	5.0	550	500			P11	6I,8P
15	**F68308**	Mask Prog ROM	5.0	650		500	1Kx8	P14	7R,9N
16	**F68A308**	Mask Prog ROM	5.0	650		360	1Kx8	P14	7R,9N
17	**F68B308**	Mask Prog ROM	5.0	650		250	1Kx8	P14	7R,9N
18	**F68316**	Mask Prog ROM	5.0			500	2Kx8	P15	7R,9N
19	**F68A316**	Mask Prog ROM	5.0			360	2Kx8	P15	7R,9N
20	**F68B316**	Mask Prog ROM	5.0			250	2Kx8	P15	7R,9N
21	**F6840**	Programmable Timer	5.0	550	1000			P16	8E,9Y
22	**F68A40**	Programmable Timer	5.0	550	667			P17	8E,9Y
23	**F68B40**	Programmable Timer	5.0	550	500			P17	8E,9Y
24	**F6843**(1)	Floppy Disk Interface	5.0						6I
25	**F6844**(1)	Direct Memory Access							6I
26	**F6845**(1)	CRT Controller	5.0					P22	6I,8P
27	**F6846**	ROM, I/O, Timer	5.0	800	1000		2Kx8	P20	6I,8P
28	**F68A46**	ROM, I/O, Timer	5.0	800	667		2Kx8	P20	6I,8P

1. To be announced
2. F6809 supports the F6800 instruction set but also has enhanced instructions and additional hardware features.

F6800 MICROPROCESSOR FAMILY

F6800 MICROPROCESSOR FAMILY (Cont'd)

Item	DEVICE NO.	Function	Power Supply V	P_D Max (Typ) mW	Cycle Time ns	Access Time ns	Memory Size	Logic/ Connection Diagram	Package(s)
1	**F68B46**	ROM, I/O, Timer	5.0	800	500		2Kx8	P20	6I,8P
2	**F68488**	GPIA (IEEE Bus)	5.0					P25	6I,8P
3	**F6850**	Async Data Adapter	5.0	300	1000			P12	7R,9N
4	**F68A50**	Async Data Adapter	5.0	300	667			P12	7R,9N
5	**F68B50**	Async Data Adapter	5.0	300	500			P12	7R,9N
6	**F6852**	Sync Data Adapter	5.0	300	1000			P17	6J,9B
7	**F68A52**	Sync Data Adapter	5.0	300	667			P17	6J,9B
8	**F68B52**	Sync Data Adapter	5.0	300	500			P17	6J,9B
9	**F6854**	Advanced Data Link CTL	5.0		1000			P18	8E,9Y
10	**F68A54**	Advanced Data Link CTL	5.0		667			P18	8E,9Y
11	**F68B54**	Advanced Data Link CTL	5.0		500			P18	8E,9Y
12	**F6860**	0-600 BPS Modem	5.0	325				P23	7R,9N
13	**F6862**	2400 BPS Modulator	5.0	300				P24	7R,9N

MICROPROCESSOR PERIPHERALS

Item	Function	DEVICE NO.	Temperature(3)	No. of Pins	Logic/Connection Diagram	Packages(s)
14	USART	**F3843**	C	28	S8	8E
15	Synchronous Protocol Communications Controller	**F3846**(1)	C	40	—	—

1. To be announced
2. F6809 supports the F6800 instruction set but also has enhanced instructions and additional hardware features.
3. C = Commercial temperature range

8-BIT BIPOLAR MICROPROCESSOR FAMILY

LSI PERIPHERAL LOGIC ELEMENTS

Item	DEVICE NO.	Functional Description	Power Supply V	Maximum Frequency MHz (Typ)	Power mW (Typ)	Logic/ Connection Diagram	Package(s)
1	**9401**	16-Bit Cyclic Redundancy Generator/Checker	5.0	18	350	P26	6A,7A
2	**9403**	16x4-Bit Serial/Parallel FIFO Buffer Memory	5.0	10	600	P27	6Q,9U
3	**9423**	64x4-Bit Serial/Parallel FIFO Buffer Memory	5.0	8.0	750	P27	6Q,9U

BIT SLICE MICROPROCESSORS

Item	DEVICE NO.	Functional Description	Power Supply V	Maximum Frequency MHz (Typ)	Power mW (Typ)	Logic/ Connection Diagram	Package(s)
4	**9404**	Data Path Switch	5.0	10	300	P28	6Q,9U
5	**9405A**	4-Bit Arithmetic Logic Register Stack (CPU slice with 8 Registers)	5.0	13	550	P29	6Q,9U
6	**9406**	16x4 push-down pop-up Program Stack	5.0	10	500	P30	6Q,9U
7	**9407**	Data Access Register (PC, SP and operand pointer)	5.0	10	450	P31	6Q,9U
8	**9408**	10-Bit Microprogram Sequencer/Controller (pipeline capability)	5.0	7.0	650	P32	6Q,9U
9	**9408A**	10-Bit Microprogram Sequencer/Controller (pipeline capability)	5.0	10	650	P32	6I,8P
10	**9410**	Register Stack (16x4 RAM with output latch)	5.0	25	375	P33	7D,9M

8-BIT CMOS MICROPROCESSOR FAMILY

LSI PERIPHERAL LOGIC ELEMENTS

Item	DEVICE NO.	Functional Description	Power Supply V	Frequency MHz (Typ @ 5V)	Power mW (Typ @ 5V)	Logic/ Connection Diagram	Package(s)
1	**4702B**	Programmable Bit Rate Generator	3-15	5.0	0.05	P35	4L,6B,9B
2	**4703B**	16x4-Bit Serial/Parallel FIFO Buffer Memory	3-15	2.3	0.015	P36	4M,6Q,9U

BIT SLICE MICROPROCESSORS

Item	DEVICE NO.	Functional Description	Power Supply V	Frequency MHz (Typ @ 5V)	Power mW (Typ @ 5V)	Logic/ Connection Diagram	Package(s)
3	**4704B**	Data Path Logic Switch	3-15	4.3	0.015	P37	4M,6Q,9U
4	**4705B**	4-Bit Arithmetic Logic Register Stack	3-15	2.0	0.015	P38	4M,6Q,9U
5	**4706B**	16x4 Push-down Pop-up Program Stack	3-15	2.0	0.015	P39	4M,6Q,9U
6	**4707B**	Data Access Register	3-15	5.2	0.015	P40	4M,6Q,9U
7	**4708B**	10-Bit Microprogram Sequencer/Controller (pipeline capability)	3-15	2.0	0.015	P41	6I,8P
8	**4710B**	Register Stack (16x4 RAM with output latch)	3-15	6.8	0.01	P42	7D,9M

16-BIT MICROPROCESSOR FAMILY

9440 16-BIT BIPOLAR MICROPROCESSOR

The 9440 I^3L microprocessor is a minicomputer CPU compactly packaged in a 40-pin DIP. It requires a 5.0 V power supply and dissipates 1.0 W of power. A full military temperature range version is available.

9440 features include TTL input/output levels, single static clock driven by an on-chip oscillator (up to 12MHz, variable), microprogram control using a PLA (program logic array), eight 16-bit on-chip registers, priority interrupt handling with up to 16 priority levels, fast direct memory access at memory speeds, four classes of instructions allowing a total of 2192 different instructions, and 32 K 16-bit words (65K byte) addressing ranges.

The 9440 system includes the following LSI support circuits:

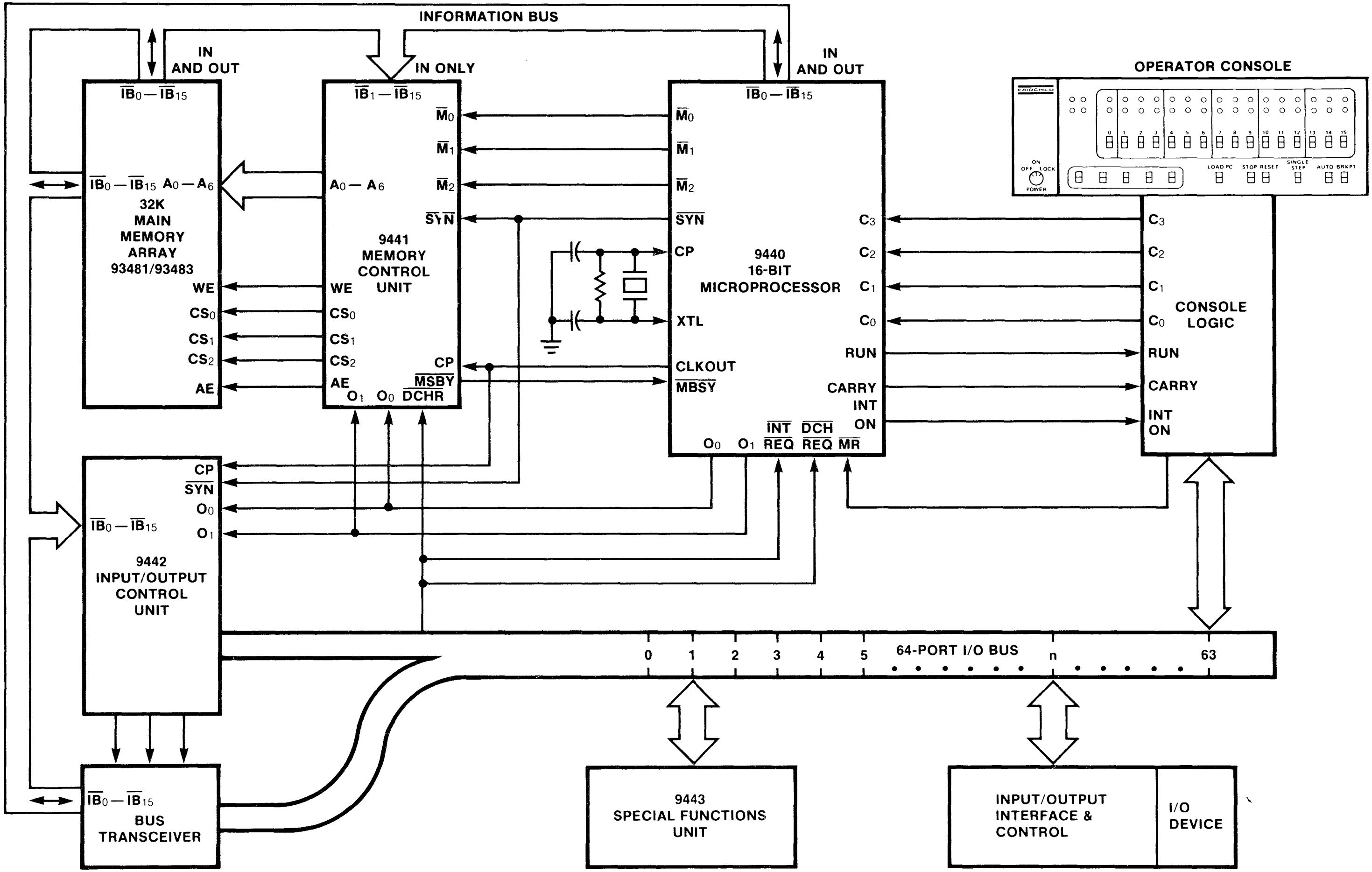
9441* Memory Control Unit—contains a 15-bit memory address register, refresh address counter and a 7-bit address multiplexer. It provides the timing and control signals to operate up to 32K words (64K bytes) of I^3L dynamic memory (93481, 93483) for read, write, refresh and DMA operations.

9442* Input/Output Control Unit—responds to I/O instructions and generates the timing and control signals for 9440 peripheral devices.

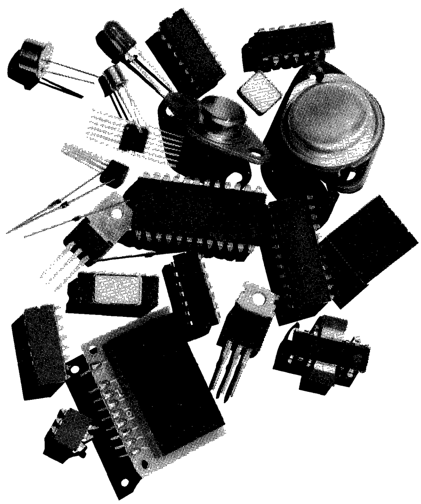
9443* Special Functions Unit—executes the multiply, divide and stack instructions.

To fully utilize the 9440 flexible instruction set the Fairchild Integrated Real-time Executive (FIRE™) software package is provided. It consists of all the required program development aids plus a full set of diagnostic programs as well as high level language processors.

*To be announced


INFORMATION BUS
IN AND OUT
IN ONLY
IN AND OUT
OPERATOR CONSOLE
$\overline{IB}_0 - \overline{IB}_{15}$
$\overline{IB}_0 - \overline{IB}_{15}$ $A_0 - A_6$
32K MAIN MEMORY ARRAY 93481/93483
WE
CS_0
CS_1
CS_2
AE
$\overline{IB}_1 - \overline{IB}_{15}$
$\overline{M}_0$
$\overline{M}_1$
$\overline{M}_2$
$\overline{SYN}$
$A_0 - A_6$
9441 MEMORY CONTROL UNIT
WE
CS_0
CS_1
CS_2
AE
CP
$\overline{MSBY}$
O_1 O_0 $\overline{DCHR}$
$\overline{IB}_0 - \overline{IB}_{15}$
$\overline{M}_0$
$\overline{M}_1$
$\overline{M}_2$
$\overline{SYN}$
CP
XTL
CLKOUT
$\overline{MBSY}$
9440 16-BIT MICROPROCESSOR
C_3
C_2
C_1
C_0
RUN
CARRY
INT ON
O_0 O_1 $\overline{INT}$ $\overline{REQ}$ $\overline{DCH}$ $\overline{REQ}$ $\overline{MR}$
C_3
C_2
C_1
C_0
CONSOLE LOGIC
RUN
CARRY
INT ON
ON OFF LOCK
POWER
LOAD PC
STOP RESET
SINGLE STEP
AUTO BRKPT
CP
$\overline{SYN}$
O_0
O_1
$\overline{IB}_0 - \overline{IB}_{15}$
9442 INPUT/OUTPUT CONTROL UNIT
0 1 2 3 4 5 64-PORT I/O BUS n 63
$\overline{IB}_0 - \overline{IB}_{15}$
BUS TRANSCEIVER
9443 SPECIAL FUNCTIONS UNIT
INPUT/OUTPUT INTERFACE & CONTROL
I/O DEVICE

9440 SYSTEM



JAN QPL STATUS

LINEAR

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**10101BCA**	741	I	B	DIP	Solder
2	**10101BCB**	741	I	B	DIP	Tin Plate
3	**10101BGA**	741	I	B	CAN	Solder
4	**10101BGB**	741	I	B	CAN	Tin Plate
5	**10101BGC**	741	I	B	CAN	Gold Plate
6	**10101BHA**	741	I	B	FLAT	Solder
7	**10101BHB**	741	I	B	FLAT	Tin Plate
8	**10101BHC**	741	I	B	FLAT	Gold Plate
9	**10101CCA**	741	I	C	DIP	Solder
10	**10101CCB**	741	I	C	DIP	Tin Plate
11	**10101CGA**	741	I	C	CAN	Solder
12	**10101CGB**	741	I	C	CAN	Tin Plate
13	**10101CGC**	741	I	C	CAN	Gold Plate
14	**10101CHA**	741	I	C	FLAT	Solder
15	**10101CHB**	741	I	C	FLAT	Tin Plate
16	**10101CHC**	741	I	C	FLAT	Gold Plate
17	**10102BAA**	747	I	B	FLAT	Solder
18	**10102BAB**	747	I	B	FLAT	Tin Plate
19	**10102BAC**	747	I	B	FLAT	Gold Plate
20	**10102BCA**	747	I	B	DIP	Solder
21	**10102BCB**	747	I	B	DIP	Tin Plate
22	**10102BIA**	747	I	B	CAN	Solder
23	**10102BIB**	747	II	B	CAN	Tin Plate
24	**10102BIC**	747	I	B	CAN	Gold Plate
25	**10102CAA**	747	I	C	FLAT	Solder
26	**10102CAB**	747	I	C	FLAT	Tin Plate
27	**10102CAC**	747	I	C	FLAT	Gold Plate
28	**10102CCA**	747	I	C	DIP	Solder
29	**10102CCB**	747	I	C	DIP	Tin Plate
30	**10102CIA**	747	I	C	CAN	Solder
31	**10102CIB**	747	II	C	CAN	Tin Plate
32	**10102CIC**	747	I	C	CAN	Gold Plate

JAN QPL STATUS

LINEAR (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**10103BCA**	101A	I	B	DIP	Solder
2	**10103BCB**	101A	I	B	DIP	Tin Plate
3	**10103BGA**	101A	I	B	CAN	Solder
4	**10103BGB**	101A	I	B	CAN	Tin Plate
5	**10103BGC**	101A	I	B	CAN	Gold Plate
6	**10103BHA**	101A	I	B	FLAT	Solder
7	**10103BHB**	101A	I	B	FLAT	Tin Plate
8	**10103BHC**	101A	I	B	FLAT	Gold Plate
9	**10103CCA**	101A	I	C	DIP	Solder
10	**10103CCB**	101A	I	C	DIP	Tin Plate
11	**10103CGA**	101A	I	C	CAN	Solder
12	**10103CGB**	101A	I	C	CAN	Tin Plate
13	**10103CGC**	101A	I	C	CAN	Gold Plate
14	**10103CHA**	101A	I	C	FLAT	Solder
15	**10103CHB**	101A	I	C	FLAT	Tin Plate
16	**10103CHC**	101A	I	C	FLAT	Gold Plate
17	**10104BCA**	108A	I	B	DIP	Solder
18	**10104BCB**	108A	I	B	DIP	Tin Plate
19	**10104BGA**	108A	I	B	CAN	Solder
20	**10104BGB**	108A	I	B	CAN	Tin Plate
21	**10104BGC**	108A	I	B	CAN	Gold Plate
22	**10104BHA**	108A	I	B	FLAT	Solder
23	**10104BHB**	108A	I	B	FLAT	Tin Plate
24	**10104BHC**	108A	I	B	FLAT	Gold Plate
25	**10104CCA**	108A	I	C	DIP	Solder
26	**10104CCB**	108A	I	C	DIP	Tin Plate
27	**10104CGA**	108A	I	C	CAN	Solder
28	**10104CGB**	108A	I	B	CAN	Tin Plate
29	**10104CGC**	108A	I	C	CAN	Gold Plate
30	**10104CHA**	108A	I	C	FLAT	Solder
31	**10104CHB**	108A	I	C	FLAT	Tin Plate
32	**10104CHC**	108A	I	C	FLAT	Gold Plate

JAN QPL STATUS

LINEAR (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	10201BCA	723	I	B	DIP	Solder
2	10201BCB	723	I	B	DIP	Tin Plate
3	10201BIA	723	I	B	CAN	Solder
4	10201BIC	723	I	B	CAN	Gold Plate
5	10201CCA	723	I	C	DIP	Solder
6	10201CCB	723	I	C	DIP	Tin Plate
7	10201CIA	723	I	C	CAN	Solder
8	10201CIC	723	I	C	CAN	Gold Plate
9	10301BCA	710	I	B	DIP	Solder
10	10301BCB	710	I	B	DIP	Tin Plate
11	10301BGA	710	I	B	CAN	Solder
12	10301BGB	710	I	B	CAN	Tin Plate
13	10301BGC	710	I	B	CAN	Gold Plate
14	10301BHA	710	I	B	FLAT	Solder
15	10301BHB	710	I	B	FLAT	Tin Plate
16	10301BHC	710	I	B	FLAT	Gold Plate
17	10301CCA	710	I	C	DIP	Solder
18	10301CCB	710	I	C	DIP	Tin Plate
19	10301CGA	710	I	C	CAN	Solder
20	10301CGB	710	I	C	CAN	Tin Plate
21	10301CGC	710	I	C	CAN	Gold Plate
22	10301CHA	710	I	C	FLAT	Solder
23	10301CHB	710	I	C	FLAT	Tin Plate
24	10301CHC	710	I	C	FLAT	Gold Plate
25	10302BCA	711	II	B	DIP	Solder
26	10302BCB	711	II	B	DIP	Tin Plate
27	10302BHA	711	II	B	FLAT	Solder
28	10302BHB	711	II	B	FLAT	Tin Plate
29	10302BHC	711	II	B	FLAT	Gold Plate
30	10302BIA	711	II	B	CAN	Solder
31	10302BIC	711	II	B	CAN	Gold Plate
32	10302CCA	711	II	C	DIP	Solder

JAN QPL STATUS

LINEAR (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**10302CCB**	711	II	C	DIP	Tin Plate
2	**10302CHA**	711	II	C	FLAT	Solder
3	**10302CHB**	711	II	C	FLAT	Tin Plate
4	**10302CHC**	711	II	C	FLAT	Gold Plate
5	**10302CIA**	711	II	C	CAN	Solder
6	**10302CIC**	711	II	C	CAN	Gold Plate
7	**10304BCA**	111	II	B	DIP	Solder
8	**10304BCB**	111	II	B	DIP	Tin Plate
9	**10304BGA**	111	II	B	CAN	Solder
10	**10304BGB**	111	II	B	CAN	Tin Plate
11	**10304BGC**	111	II	B	CAN	Gold Plate
12	**10304BHA**	111	II	B	FLAT	Solder
13	**10304BHB**	111	II	B	FLAT	Tin Plate
14	**10304BHC**	111	II	B	FLAT	Gold Plate
15	**10304CCA**	111	II	C	DIP	Solder
16	**10304CCB**	111	II	C	DIP	Tin Plate
17	**10304CGA**	111	II	C	CAN	Solder
18	**10304CGB**	111	II	C	CAN	Tin Plate
19	**10304CGC**	111	II	C	CAN	Gold Plate
20	**10304CHA**	111	II	C	FLAT	Solder
21	**10304CHB**	111	II	C	FLAT	Tin Plate
22	**10304CHC**	111	II	C	FLAT	Gold Plate
23	**10401BAA**	55107	I	B	FLAT	Solder
24	**10401BAB**	55107	I	B	FLAT	Tin Plate
25	**10401BAC**	55107	I	B	FLAT	Gold Plate
26	**10401BCA**	55107	I	B	DIP	Solder
27	**10401BCB**	55107	I	B	DIP	Tin Plate
28	**10401CAA**	55107	I	C	FLAT	Solder
29	**10401CAB**	55107	I	C	FLAT	Tin Plate
30	**10401CAC**	55107	I	C	FLAT	Gold Plate
31	**10401CCA**	55107	I	C	DIP	Solder
32	**10401CCB**	55107	I	C	DIP	Tin Plate
33	**10402BAA**	55108	I	B	FLAT	Solder

JAN QPL STATUS

LINEAR (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**10402BAB**	55108	I	B	FLAT	Tin Plate
2	**10402BAC**	55108	I	B	FLAT	Gold Plate
3	**10402BCA**	55108	I	B	DIP	Solder
4	**10402BCB**	55108	I	B	DIP	Tin Plate
5	**10402CAA**	55108	I	C	FLAT	Solder
6	**10402CAB**	55108	I	C	FLAT	Tin Plate
7	**10402CAC**	55108	I	C	FLAT	Gold Plate
8	**10402CCA**	55108	I	C	DIP	Solder
9	**10402CCB**	55108	I	C	DIP	Tin Plate
10	**10403BEA**	9614	I	B	DIP	Solder
11	**10403BEB**	9614	I	B	DIP	Tin Plate
12	**10403BFA**	9614	I	B	FLAT	Solder
13	**10403BFB**	9614	I	B	FLAT	Tin Plate
14	**10403BFC**	9614	I	B	FLAT	Gold Plate
15	**10403CEA**	9614	I	C	DIP	Solder
16	**10403CEB**	9614	I	C	DIP	Tin Plate
17	**10403CFA**	9614	I	C	FLAT	Solder
18	**10403CFB**	9614	I	C	FLAT	Tin Plate
19	**10403CFC**	9614	I	C	FLAT	Gold Plate
20	**10404BEA**	9615	I	B	DIP	Solder
21	**10404BEB**	9615	I	B	DIP	Tin Plate
22	**10404BFA**	9615	I	B	FLAT	Solder
23	**10404BFB**	9615	I	B	FLAT	Tin Plate
24	**10404BFC**	9615	I	B	FLAT	Gold Plate
25	**10404CEA**	9615	I	C	DIP	Solder
26	**10404CEB**	9615	I	C	DIP	Tin Plate
27	**10404CFA**	9615	I	C	FLAT	Solder
28	**10404CFB**	9615	I	C	FLAT	Tin Plate
29	**10404CFC**	9615	I	C	FLAT	Gold Plate
30	**10802BCA**	3045	II	B	DIP	Solder
31	**10802BCB**	3045	II	B	DIP	Tin Plate
32	**10802CCA**	3045	II	C	DIP	Solder
33	**10802CCB**	3045	II	C	DIP	Tin Plate

JAN QPL STATUS

DIGITAL

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**00101BAB**	5430	I	B	FLAT	Tin Plate
2	**00101BAC**	5430	I	B	FLAT	Gold Plate
3	**00101BCB**	5430	I	B	DIP	Tin Plate
4	**00101CAB**	5430	I	C	DIP	Tin Plate
5	**00101CAC**	5430	I	C	FLAT	Gold Plate
6	**00101CCB**	5430	I	C	DIP	Tin Plate
7	**00102BAB**	5420	I	B	FLAT	Tin Plate
8	**00102BAC**	5420	I	B	FLAT	Gold Plate
9	**00102BCB**	5420	I	B	DIP	Tin Plate
10	**00102CAB**	5420	I	C	FLAT	Tin Plate
11	**00102CAC**	5420	I	C	FLAT	Gold Plate
12	**00102CCB**	5420	I	C	DIP	Tin Plate
13	**00103BCB**	5410	I	B	DIP	Tin Plate
14	**00103CCB**	5410	I	C	DIP	Tin Plate
15	**00104BAB**	5400	I	B	FLAT	Tin Plate
16	**00104BAC**	5400	I	B	FLAT	Gold Plate
17	**00104BCB**	5400	I	B	DIP	Tin Plate
18	**00104CAB**	5400	I	C	FLAT	Tin Plate
19	**00104CAC**	5400	I	C	FLAT	Gold Plate
20	**00104CCB**	5400	I	C	DIP	Tin Plate
21	**00105BAB**	5404	I	B	FLAT	Tin Plate
22	**00105BAC**	5404	I	B	FLAT	Gold Plate
23	**00105BCB**	5404	I	B	DIP	Tin Plate
24	**00105CAB**	5404	I	C	FLAT	Tin Plate
25	**00105CAC**	5404	I	C	FLAT	Gold Plate
26	**00105CCB**	5404	I	C	DIP	Tin Plate
27	**00107BAB**	5401	I	B	FLAT	Tin Plate
28	**00107BAC**	5401	I	B	FLAT	Gold Plate
29	**00107BCB**	5401	I	B	DIP	Tin Plate
30	**00107CAB**	5401	I	C	FLAT	Tin Plate
31	**00107CAC**	5401	I	C	FLAT	Gold Plate
32	**00107CCB**	5401	I	C	DIP	Tin Plate

JAN QPL STATUS

DIGITAL (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**00108BAB**	5405	I	B	FLAT	Tin Plate
2	**00108BAC**	5405	I	B	FLAT	Gold Plate
3	**00108BCB**	5405	I	B	DIP	Tin Plate
4	**00108CAB**	5405	I	C	FLAT	Tin Plate
5	**00108CAC**	5405	I	C	FLAT	Gold Plate
6	**00108CCB**	5405	I	C	DIP	Tin Plate
7	**00109BCB**	5403	I	B	DIP	Tin Plate
8	**00109CCB**	5403	I	C	DIP	Tin Plate
9	**00205BAB**	5474	I	B	FLAT	Tin Plate
10	**00205BAC**	5474	I	B	FLAT	Gold Plate
11	**00205CAB**	5474	I	C	FLAT	Tin Plate
12	**00205CAC**	5474	I	C	FLAT	Gold Plate
13	**00206BAB**	5470	I	B	FLAT	Tin Plate
14	**00206CAB**	5470	I	C	FLAT	Tin Plate
15	**00301BAB**	5440	I	B	FLAT	Tin Plate
16	**00301BAC**	5440	I	B	FLAT	Gold Plate
17	**00301BCB**	5440	I	B	DIP	Tin Plate
18	**00301CAB**	5440	I	C	FLAT	Tin Plate
19	**00301CAC**	5440	I	C	FLAT	Gold Plate
20	**00301CCB**	5440	I	C	DIP	Tin Plate
21	**00303BAB**	5438	I	B	FLAT	Tin Plate
22	**00303BAC**	5438	I	B	FLAT	Gold Plate
23	**00303CAB**	5438	I	C	FLAT	Tin Plate
24	**00303CAC**	5438	I	C	FLAT	Gold Plate
25	**00401BAB**	5402	I	B	FLAT	Tin Plate
26	**00401BAC**	5402	I	B	FLAT	Gold Plate
27	**00401BCB**	5402	I	B	DIP	Tin Plate
28	**00401CAB**	5402	I	C	FLAT	Tin Plate
29	**00401CAC**	5402	I	C	FLAT	Gold Plate
30	**00401CCB**	5402	I	C	DIP	Tin Plate
31	**00404BCB**	5427	I	B	DIP	Tin Plate
32	**00404CCB**	5427	I	C	DIP	Tin Plate

JAN QPL STATUS

DIGITAL (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	00701BAB	5486	I	B	FLAT	Tin Plate
2	00701BAC	5486	I	B	FLAT	Gold Plate
3	00701CAB	5486	I	C	FLAT	Tin Plate
4	00701CAC	5486	I	C	FLAT	Gold Plate
5	00801BAB	5406	I	B	FLAT	Tin Plate
6	00801BAC	5406	I	B	FLAT	Gold Plate
7	00801CAB	5406	I	C	FLAT	Tin Plate
8	00801CAC	5406	I	C	FLAT	Gold Plate
9	00802BAB	5416	I	B	FLAT	Tin Plate
10	00802BAC	5416	I	B	FLAT	Gold Plate
11	00802CAB	5416	I	C	FLAT	Tin Plate
12	00802CAC	5416	I	C	FLAT	Gold Plate
13	00803BAB	5407	I	B	FLAT	Tin Plate
14	00803BAC	5407	I	B	FLAT	Gold Plate
15	00803CAB	5407	I	C	FLAT	Tin Plate
16	00803CAC	5407	I	C	FLAT	Gold Plate
17	00804BAB	5417	I	B	FLAT	Tin Plate
18	00804BAC	5417	I	B	FLAT	Gold Plate
19	00804CAB	5417	I	C	FLAT	Tin Plate
20	00804CAC	5417	I	C	FLAT	Gold Plate
21	01601BCB	5408	I	B	DIP	Tin Plate
22	01601CCB	5408	I	C	DIP	Tin Plate
23	01602BCB	5409	I	B	DIP	Tin Plate
24	01602CCB	5409	I	C	DIP	Tin Plate
25	02301BAB	54H30	I	B	FLAT	Tin Plate
26	02301BAC	54H30	I	B	FLAT	Gold Plate
27	02301BCB	54H30	I	B	DIP	Tin Plate
28	02301CAB	54H30	I	C	FLAT	Tin Plate
29	02301CAC	54H30	I	C	FLAT	Gold Plate
30	02301CCB	54H30	I	C	DIP	Tin Plate
31	02302BCB	54H20	I	B	DIP	Tin Plate
32	02302CCB	54H20	I	C	DIP	Tin Plate

JAN QPL STATUS

DIGITAL (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**02303BCB**	54H10	I	B	DIP	Tin Plate
2	**02303CCB**	54H10	I	C	DIP	Tin Plate
3	**02304BCB**	54H00	I	B	DIP	Tin Plate
4	**02304CCB**	54H00	I	C	DIP	Tin Plate
5	**02305BAB**	54H04	I	B	FLAT	Tin Plate
6	**02305BAC**	54H04	I	B	FLAT	Gold Plate
7	**02305BCB**	54H04	I	B	DIP	Tin Plate
8	**02305CAB**	54H04	I	C	FLAT	Tin Plate
9	**02305CAC**	54H04	I	C	FLAT	Gold Plate
10	**02305CCB**	54H04	I	C	DIP	Tin Plate
11	**02307BCB**	54H22	I	B	DIP	Tin Plate
12	**02307CCB**	54H22	I	C	DIP	Tin Plate
13	**03001BCB**	930	I	B	DIP	Tin Plate
14	**03001CCB**	930	I	C	DIP	Tin Plate
15	**03004BCB**	946	I	B	DIP	Tin Plate
16	**03004CCB**	946	I	C	DIP	Tin Plate
17	**03005BCB**	962	I	B	DIP	Tin Plate
18	**03005CCB**	962	I	C	DIP	Tin Plate
19	**30001BAB**	54LS00	II	B	FLAT	Tin Plate
20	**30001BAC**	54LS00	II	B	FLAT	Gold Plate
21	**30001CAB**	54LS00	II	C	FLAT	Tin Plate
22	**30001CAC**	54LS00	II	C	FLAT	Gold Plate
23	**30003BAB**	54LS04	II	B	FLAT	Tin Plate
24	**30003BAC**	54LS04	II	B	FLAT	Gold Plate
25	**30003CAB**	54LS04	II	C	FLAT	Tin Plate
26	**30003CAC**	54LS04	II	C	FLAT	Gold Plate
27	**30005BAB**	54LS10	II	B	FLAT	Tin Plate
28	**30005BAC**	54LS10	II	B	FLAT	Gold Plate
29	**30005CAB**	54LS10	II	C	FLAT	Tin Plate
30	**30005CAC**	54LS10	II	C	FLAT	Gold Plate
31	**30007BAB**	54LS20	II	B	FLAT	Tin Plate
32	**30007BAC**	54LS20	II	B	FLAT	Gold Plate

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JAN QPL STATUS

DIGITAL (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**30007CAB**	54LS20	II	C	FLAT	Tin Plate
2	**30007CAC**	54LS20	II	C	FLAT	Gold Plate
3	**30009BAB**	54LS30	II	B	FLAT	Tin Plate
4	**30009BAC**	54LS30	II	B	FLAT	Gold Plate
5	**30009CAB**	54LS30	II	C	FLAT	Tin Plate
6	**30009CAC**	54LS30	II	C	FLAT	Gold Plate
7	**30103BEB**	54LS112	II	B	DIP	Tin Plate
8	**30103CEB**	54LS112	II	C	DIP	Tin Plate
9	**30105BEB**	54LS114	II	B	DIP	Tin Plate
10	**30105CEB**	54LS114	II	C	DIP	Tin Plate
11	**30106BEB**	54LS174	II	B	DIP	Tin Plate
12	**30106CEB**	54LS174	II	C	DIP	Tin Plate
13	**30109BEB**	54LS109	II	B	DIP	Tin Plate
14	**30109BFB**	54LS109	II	B	FLAT	Tin Plate
15	**30109CEB**	54LS109	II	C	DIP	Tin Plate
16	**30109CFB**	54LS109	II	C	FLAT	Tin Plate
17	**30301BAB**	54LS02	II	B	FLAT	Tin Plate
18	**30301BAC**	54LS02	II	B	FLAT	Gold Plate
19	**30301CAB**	54LS02	II	C	FLAT	Tin Plate
20	**30301CAC**	54LS02	II	C	FLAT	Gold Plate
21	**30302BCB**	54LS27	II	B	DIP	Tin Plate
22	**30302BAB**	54LS27	II	B	FLAT	Tin Plate
23	**30302BAC**	54LS27	II	B	FLAT	Gold Plate
24	**30302CCB**	54LS27	II	C	DIP	Tin Plate
25	**30302CAB**	54LS27	II	C	FLAT	Tin Plate
26	**30302CAC**	54LS27	II	C	FLAT	Gold Plate
27	**30501BCB**	54LS32	II	B	DIP	Tin Plate
28	**30501BAB**	54LS32	II	B	FLAT	Tin Plate
29	**30501BAC**	54LS32	II	B	FLAT	Gold Plate
30	**30501CCB**	54LS32	II	C	DIP	Tin Plate
31	**30501CAB**	54LS32	II	C	FLAT	Tin Plate
32	**30501CAC**	54LS32	II	C	FLAT	Gold Plate

JAN QPL STATUS

DIGITAL (Cont'd)

Item	DEVICE NO. JM38510/	Industry Basic Type	Part I or II QPL	Process Level	Package	Lead Finish
1	**30701BEB**	54LS138	II	B	DIP	Tin Plate
2	**30701BFB**	54LS138	II	B	FLAT	Tin Plate
3	**30701CEB**	54LS138	II	C	DIP	Tin Plate
4	**30701CFB**	54LS138	II	C	FLAT	Tin Plate
5	**30702BEB**	54LS139	II	B	DIP	Tin Plate
6	**30702CEB**	54LS139	II	C	DIP	Tin Plate
7	**31001BCB**	54LS11	II	B	DIP	Tin Plate
8	**31001BAB**	54LS11	II	B	FLAT	Tin Plate
9	**31001BAC**	54LS11	II	B	FLAT	Gold Plate
10	**31001CCB**	54LS11	II	C	DIP	Tin Plate
11	**31001CAB**	54LS11	II	C	FLAT	Tin Plate
12	**31001CAC**	54LS11	II	C	FLAT	Gold Plate
13	**31003BAB**	54LS21	II	B	FLAT	Tin Plate
14	**31003BAC**	54LS21	II	B	FLAT	Gold Plate
15	**31003CAB**	54LS21	II	C	FLAT	Tin Plate
16	**31003CAC**	54LS21	II	C	FLAT	Gold Plate
17	**31004BCB**	54LS08	II	B	DIP	Tin Plate
18	**31004BAB**	54LS08	II	B	FLAT	Tin Plate
19	**31004BAC**	54LS08	II	B	FLAT	Gold Plate
20	**31004CCB**	54LS08	II	C	DIP	Tin Plate
21	**31004CAB**	54LS08	II	C	FLAT	Tin Plate
22	**31004CAC**	54LS08	II	C	FLAT	Gold Plate

JAN QPL STATUS

DIODE
QPL-19500

Item		Item		Item		Item	
1	1N251 JAN	30	1N914 JTX	59	1N971B-1 JTX*	88	1N4306 JTX
2	1N457 JAN	31	1N962B-1 JAN*	60	1N971B-1 JTXV*	89	1N4307 JAN
3	1N458 JAN	32	1N962B-1 JTX*	61	1N972B-1 JAN*	90	1N4307 JTX
4	1N459 JAN	33	1N962B-1 JTXV*	62	1N972B-1 JTX*	91	1N4307 JTXV
5	1N483B JAN	34	1N963B-1 JAN*	63	1N972B-1 JTXV*	92	1N4376 JAN
6	1N483B JTX	35	1N963B-1 JTX*	64	1N973B-1 JAN*	93	1N4376 JTX
7	1N485B JAN	36	1N963B-1 JTXV*	65	1N973B-1 JTX*	94	1N4454 JAN
8	1N485B JTX	37	1N964B-1 JAN*	66	1N973B-1 JTXV*	95	1N4454 JTX
9	1N486B JAN	38	1N964B-1 JTX*	67	1N3064 JAN	96	1N4454 JTXV
10	1N486B JTX	39	1N964B-1 JTXV*	68	1N3064 JTX	97	1N4454-1 JAN*
11	1N747A JAN	40	1N965B-1 JAN*	69	1N3595 JAN	98	1N4454-1 JTX*
12	1N747A JTX	41	1N965B-1 JTX*	70	1N3595 JTX	99	1N4454-1 JTXV*
13	1N747A JTXV	42	1N965B-1 JTXV*	71	1N3595 JTXV	100	1N5768 JAN
14	1N748A JAN	43	1N966B-1 JAN*	72	1N3600 JAN	101	1N5768 JTX
15	1N748A JTX	44	1N966B-1 JTX*	73	1N3600 JTX	102	1N5768 JTXV
16	1N748A JTXV	45	1N966B-1 JTXV*	74	1N3600 JTXV	103	1N5770 JAN
17	1N749A JAN	46	1N967B-1 JAN*	75	1N4148 JAN	104	1N5770 JTX
18	1N749A JTX	47	1N967B-1 JTX*	76	1N4148 JTX	105	1N5770 JTXV
19	1N749A JTXV	48	1N967B-1 JTXV*	77	1N4148 JTXV	106	1N5772 JAN
20	1N750A JAN	49	1N968B-1 JAN*	78	1N4148-1 JAN*	107	1N5772 JTX
21	1N750A JTX	50	1N968B-1 JTX*	79	1N4148-1 JTX*	108	1N5772 JTXV
22	1N750A JTXV	51	1N968B-1 JTXV*	80	1N4148-1 JTXV*	109	1N5774 JAN
23	1N751A JAN	52	1N969B-1 JAN*	81	1N4150 JAN	110	1N5774 JTX
24	1N751A JTX	53	1N969B-1 JTX*	82	1N4150 JTX	111	1N5774 TXV
25	1N751A JTXV	54	1N969B-1 JTXV*	83	1N4150 JTXV	112	1N6100 JAN
26	1N752A JAN	55	1N970B-1 JAN*	84	1N4150-1 JAN	113	1N6100 JTX
27	1N752A JTX	56	1N970B-1 JTX*	85	1N4150-1 JTX	114	1N6100 JTXV
28	1N752A JTXV	57	1N970B-1 JTXV*	86	1N4150-1 JTXV		
29	1N914 JAN	58	1N971B-1 JAN*	87	1N4306 JAN		

*Utilizes metallurgical bond.

JAN QPL STATUS

TRANSISTOR
QPL-19500

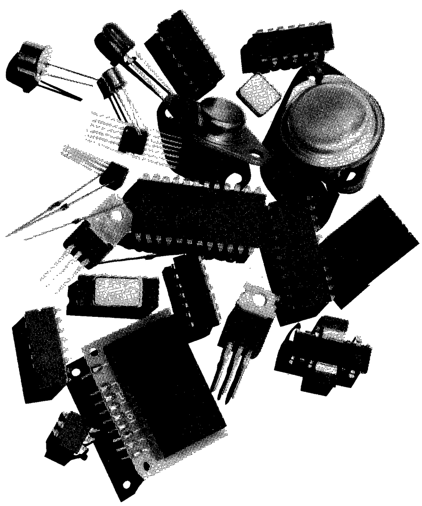
Item		Item		Item		Item	
1	2N706 JAN	22	2N2218A JAN	43	2N2369A JAN	64	2N2906 JTX
2	2N708 JAN	23	2N2218A JTX	44	2N2369A JTX	65	2N2906 TXV
3	2N708 JTX	24	2N2218A TXV	45	2N2369A TXV	66	2N2906A JAN
4	2N718A JAN	25	2N2219 JAN	46	2N2481 JAN	67	2N2906A JTX
5	2N718A JTX	26	2N2219 JTX	47	2N2481 JTX	68	2N2906A TXV
6	2N718A TXV	27	2N2219 TXV	48	2N2484 JAN	69	2N2907 JAN
7	2N744 JAN	28	2N2219A JAN	49	2N2484 JTX	70	2N2907 JTX
8	2N914 JAN	29	2N2219A JTX	50	2N2484 TXV	71	2N2907 TXV
9	2N914 JTX	30	2N2219A TXV	51	2N2904 JAN	72	2N2907A JAN
10	2N918 JAN	31	2N2221 JAN	52	2N2904 JTX	73	2N2907A JTX
11	2N918 JTX	32	2N2221 JTX	53	2N2904 TXV	74	2N2907A TXV
12	2N918 TXV	33	2N2221 TXV	54	2N2904A JAN	75	2N2919 JAN
13	2N930 JAN	34	2N2221A JAN	55	2N2904A JTX	76	2N2919 JTX
14	2N930 JTX	35	2N2221A JTX	56	2N2904A TXV	77	2N2919 TXV
15	2N1132 JAN	36	2N2221A TXV	57	2N2905 JAN	78	2N2920 JAN
16	2N1613 JAN	37	2N2222 JAN	58	2N2905 JTX	79	2N2920 JTX
17	2N1613 JTX	38	2N2222 JTX	59	2N2905S TXV	80	2N2920 TXV
18	2N1613 TXV	39	2N2222 TXV	60	2N2905A JAN	81	2N3013 JAN
19	2N2218 JAN	40	2N2222A JAN	61	2N2905A JTX	82	2N3013 JTX
20	2N2218 JTX	41	2N2222A JTX	62	2N2905SA TXV		
21	2N2218 TXV	42	2N2222A TXV	63	2N2906 JAN		

JAN QPL STATUS

UPCOMING QUALIFICATIONS

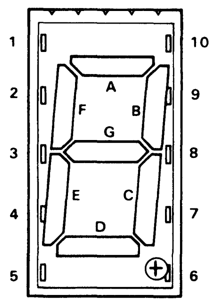
Fairchild plans to obtain numerous additional device qualifications. Although QPL attainment dates cannot be scheduled with accuracy, the following Fairchild products are expected to be qualified in the near future. Budgetary quotations are available:

Item	Jan Part Number	Fairchild Part Number	Package	Comments
1	**M38510/31101---**	54LS85	DIP/FLAT	—
2	**M38510/30001---**	54LS00	DIP	Part I QPL
3	**M38510/30301---**	54LS02	DIP	Part I QPL
4	**M38510/31003---**	54LS21	DIP	Part I QPL
5	**M38510/30901---**	54LS151	DIP/FLAT	—
6	**M38510/30902---**	54LS153	DIP/FLAT	—
7	**M38510/30903---**	54LS157	DIP/FLAT	—
8	**M38510/30904---**	54LS158	DIP/FLAT	—
9	**M38510/30905---**	54LS251	DIP/FLAT	—
10	**M38510/30908---**	54LS253	DIP/FLAT	—
11	**M38510/30102---**	54LS74	DIP/FLAT	—
12	**M38510/30107---**	54LS175	DIP/FLAT	—
13	**M38510/30106---**	54LS174	DIP/FLAT	—
14	**M38510/01701---**	54174	DIP/FLAT	—
15	**M38510/01702---**	54175	DIP/FLAT	—
16	**M38510/01306---**	54161	DIP/FLAT	—
17	**M38510/30602---**	54LS195	DIP/FLAT	—
18	**M38510/15802---**	9317	DIP/FLAT	—
19	**M38510/30906---**	54LS257	DIP/FLAT	—
20	**M38510/30907---**	54LS258	DIP/FLAT	—
21	**MIL-S-19500/2N5302**	2N5302	—	JAN/JTX/JTXV



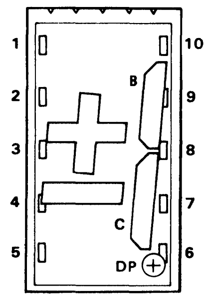
OPTOELECTRONICS

O1



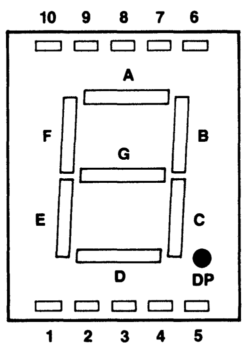
PIN	FND350/357/360/367
1	Common-Cathode
2	Segment F
3	Segment G
4	Segment E
5	Segment D
6	Common-Cathode
7	Decimal Point
8	Segment C
9	Segment B
10	Segment A

O2



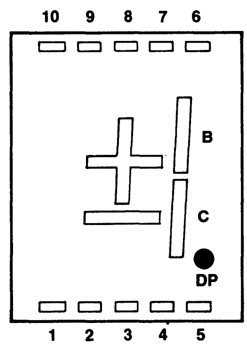
PIN	FND351/358/361/368
1	Common-Cathode
2	Plus Sign
3	Minus Sign
4	NC
5	Omitted
6	Common-Cathode
7	Decimal Point
8	Segment C
9	Segment B
10	NC

O3



PIN	FND507/537 547/557/567	FND500/530 540/550/560
1	Segment E	Segment E
2	Segment D	Segment D
3	Comm-Anode	Comm-Cathode
4	Segment C	Segment C
5	Decimal Point	Decimal Point
6	Segment B	Segment B
7	Segment A	Segment A
8	Comm-Anode	Comm-Cathode
9	Segment F	Segment F
10	Segment G	Segment G

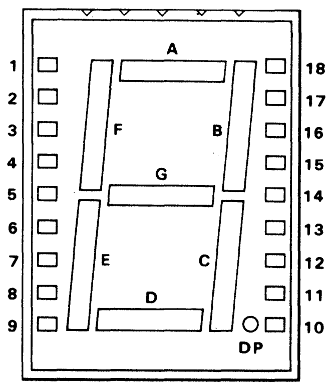
O4



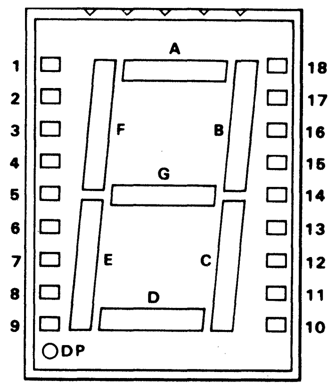
PIN	FND501/531 541/551/561	FND508/538 548/558/568
1	Minus	Minus
2	Cathode ±	Anode ±
3	Segment C	Segment C
4	Cathode 1/DP	Anode 1/DP
5	Decimal Point	Decimal Point
6	Segment B	Segment B
7	Cathode 1/DP	Anode 1/DP
8	Cathode ±	Anode ±
9	Plus	Plus
10	NC	NC

OPTOELECTRONICS

O5



O6

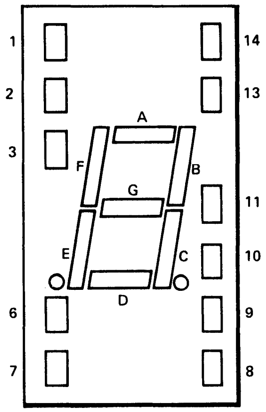


PIN	FND800	FND807
1	Omitted	Omitted
2	Segment A	Segment A
3	Segment F	Segment F
4	Common-Cath.	Common-Anode
5	Segment E	Segment E
6	Common-Cath.	Common-Anode
7	NC	NC
8	Omitted	Omitted
9	Omitted	Omitted
10	Decimal Point	Decimal Point
11	Segment D	Segment D
12	Common-Cath.	Common-Anode
13	Segment C	Segment C
14	Segment G	Segment G
15	Segment B	Segment B
16	Omitted	Omitted
17	Common-Cath.	Common-Anode
18	Omitted	Omitted

PIN	FND850	FND847
1	Omitted	Omitted
2	Segment A	Segment A
3	Segment F	Segment F
4	Common-Cath.	Common-Anode
5	Segment E	Segment E
6	Common-Cath.	Common-Anode
7	DP	DP
8	Omitted	Omitted
9	Omitted	Omitted
10	NC	NC
11	Segment D	Segment D
12	Common-Cath.	Common-Anode
13	Segment C	Segment C
14	Segment G	Segment G
15	Segment B	Segment B
16	Omitted	Omitted
17	Common-Cath.	Common-Anode
18	Omitted	Omitted

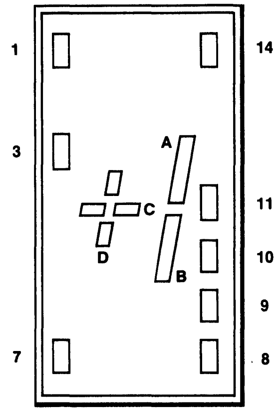
OPTOELECTRONICS

O7



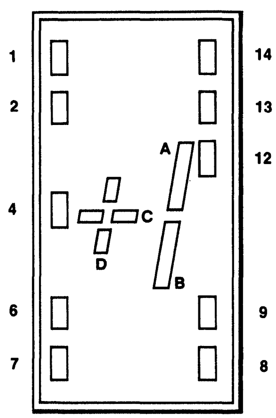
PIN	MAN71A	MAN72A
1	Cathode A	Cathode A
2	Cathode F	Cathode F
3	Common-Anode	Common-Anode
4	No pin	No pin
5	No pin	No pin
6	NC	Cathode DP
7	Cathode E	Cathode E
8	Cathode D	Cathode D
9	Common-Anode	NC
10	Cathode C	Cathode C
11	Cathode G	Cathode G
12	No pin	No pin
13	Cathode B	Cathode B
14	Common-Anode	Common-Anode

O8



PIN	MAN73A
1	Anode C, D
2	No pin
3	Anode C, D
4	No pin
5	No pin
6	No pin
7	Cathode D
8	Cathode C
9	NC
10	Cathode B
11	Cathode A
12	No pin
13	No pin
14	Anode A, B

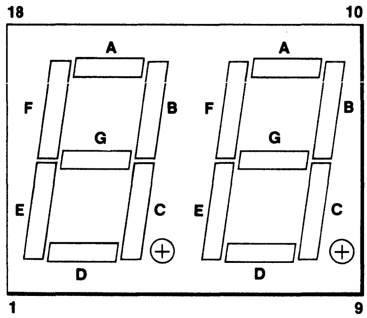
O9



PIN	MAN74A
1	Anode F
2	Anode G
3	No pin
4	Common-Cathode
5	No pin
6	Anode E
7	Anode D
8	Anode C
9	Anode DP
10	No pin
11	No pin
12	Common-Cathode
13	Anode B
14	Anode A

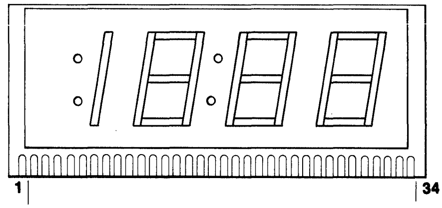
OPTOELECTRONICS

O10



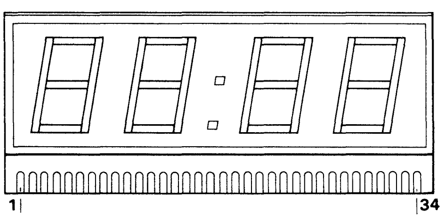
PIN	FND6710	FND6740
1	E Cath. Digit 1	C Cath. Digit 1
2	D Cath. Digit 1	D Cath. Digit 1
3	C Cath. Digit 1	B Cath. Digit 1
4	DP Cath. Digit 1	DP Cath. Digit 1
5	E Cath. Digit 2	E Cath. Digit 2
6	D Cath. Digit 2	D Cath. Digit 2
7	G Cath. Digit 2	G Cath. Digit 2
8	C Cath. Digit 2	C Cath. Digit 2
9	DP Cath. Digit 2	DP Cath. Digit 2
10	B Cath. Digit 2	B Cath. Digit 2
11	A Cath. Digit 2	A Cath. Digit 2
12	F Cath. Digit 2	F Cath. Digit 2
13	Digit 2 Anode	Digit 2 Anode
14	Digit 1 Anode	Digit 1 Anode
15	B Cath. Digit 1	A Cath. Digit 1
16	A Cath. Digit 1	NC
17	G Cath. Digit 1	NC
18	F Cath. Digit 1	NC

O11



PIN	FCS8000/FCS8001		
1	NC	18	10 Min. F
2	NC	19	10 Min. E
3	Indicator	20	10 Min. G
4	NC	21	10 Min. A
5	Indicator	22	10 Min. D
6	10 Hrs. C	23	10 Min. B
7	10 Hrs. B	24	10 Min. C
8	NC	25	NC
9	Hrs. F	26	Min. F
10	Hrs. G	27	Min. E
11	Hrs. E	28	Min. G
12	Hrs. A	29	Min. A
13	Hrs. B	30	Min. B
14	Hrs. D	31	Min. C
15	Hrs. C	32	Min. D
16	Colons	33	NC
17	NC	34	V_{LED}

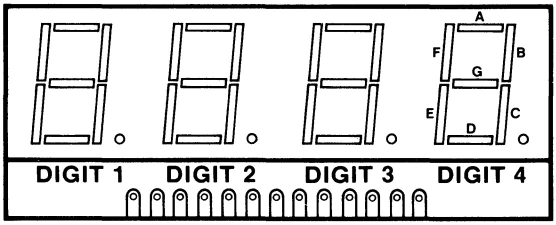
O12



PIN	FCS8024/FCS8025		
1	10 Hrs. A	18	10 Min. F
2	10 Hrs. E	19	10 Min. E
3	10 Hrs. D	20	10 Min. G
4	10 Hrs. G	21	10 Min. A
5	10 Hrs. F	22	10 Min. D
6	10 Hrs. C	23	10 Min. B
7	10 Hrs. B	24	10 Min. C
8	NC	25	NC
9	Hrs. F	26	Min. F
10	Hrs. G	27	Min. E
11	Hrs. E	28	Min. G
12	Hrs. A	29	Min. A
13	Hrs. B	30	Min. B
14	Hrs. D	31	Min. C
15	Hrs. C	32	Min. D
16	Colons	33	NC
17	NC	34	V_{LED}

OPTOELECTRONICS

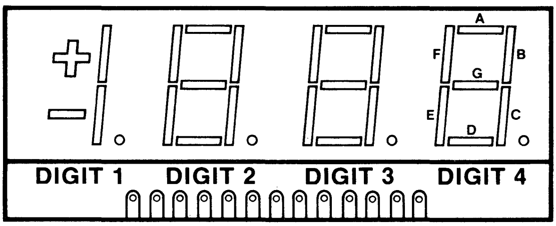
O13



PIN	FNA5420	FNA5427
1	Digit 1 Com. Anode	Digit 1 Com. Cath.
2	Seg. G	Seg. G "Plus" Sign Anode
3	NC	NC
4	Seg. F	Seg. F
5	Seg. D	Seg. D "Minus" Sign Anode
6	Digit 2 Com. Anode	Digit 2 Com. Cath.
7	Seg. A	Seg. A
8	Seg. B	Seg. B
9	Digit 3 Com. Anode	Digit 3 Com. Cath.
10	RNDP	RHDP
11	Seg. C	Seg. C
12	Seg. E	Seg. E
13	Digit 4 Com. Anode	Digit 4 Com. Cath.

Preliminary Pin Assignment

O14

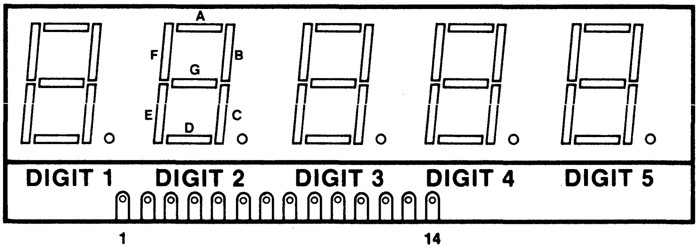


PIN	FNA5428	FNA5421
1	Digit 1 Com. Anode	Digit 1 Com. Cath.
2	Seg. G "Plus" Sign Cathode	Seg. G
3	NC	LHDP
4	Seg. F	Seg. F
5	Seg. D "Minus" Sign Cath.	Seg. D
6	Digit 2 Com. Anode	Digit 2 Com. Cath.
7	Seg. A	Seg. A
8	Seg. B	Seg. B
9	Digit 3 Com. Anode	Digit 3 Com. Cath.
10	RHDP	RHDP
11	Seg. C	Seg. C
12	Seg. E	Seg. E
13	Digit 4 Com. Anode	Digit 4 Com. Cath.

Preliminary Pin Assignment

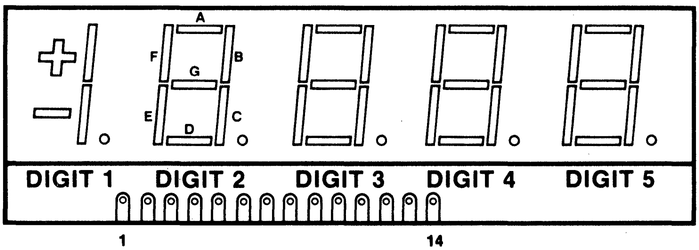
OPTOELECTRONICS

O15



PIN	FNA5520*	FNA5527*
1	LHDP Anodes	LHDP Cathodes
2	Digit 1 Com. Cathodes	Digit 1 Com. Anode
3	Seg. G, "Plus" Sign Anodes	Seg. G, "Plus Sign Cath.
4	Seg. F Anodes	Seg. F Cath.
5	Seg. D, "Minus" Sign Anodes	Seg. D, "Minus" Sign Cath.
6	Digit 2 com. Cathodes	Digit 2 Com. Anode
7	Seg. A Anodes	Seg. A Cath.
8	Seg. B Anodes	Seg. B Cath.
9	Digit 3 Com. Cathodes	Digit 3 Com. Anode
10	RHDP Anodes	RHDP Cath.
11	Seg. C Anodes	Seg. C Cath.
12	Seg. E Anodes	Seg. E Cath.
13	Digit 4 Com. Cathodes	Digit 4 Com. Anode
14	Digit 5 Com. Cathodes	Digit 5 Com. Anode

O16

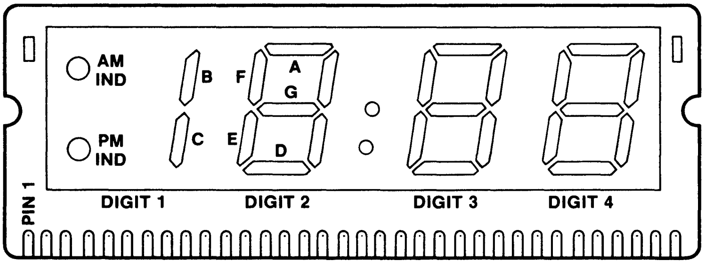


PIN	FNA5521	FNA5528*
1	NC	NC
2	Com. Cath. Digit 1	Com. Anode Digit 1
3	Seg. G/"Plus" Ind. Anodes	Seg. G, "Plus" Sign Cath.
4	Seg. F Anodes	Seg. F Cath.
5	Seg. D Anodes/Minus	Seg. D Cath.
6	Com. Cath. Digit 2	Digit 2 Com. Anode
7	Seg. A Anodes	Seg. A Cath.
8	Seg. B Anodes	Seg. B Cath.
9	Com. Cath. Digit 3	Digit 3 Com. Anode
10	DP Anodes	DP Cath.
11	Seg. C Anodes	Seg. C Cath.
12	Seg. E Anodes	Seg. E Cath.
13	Com. Cath. Digit 4	Digit 4 Com. Anode
14	Com. Cath. Digit 5	Digit 5 Com. Anode

***Preliminary Pin Assignment**

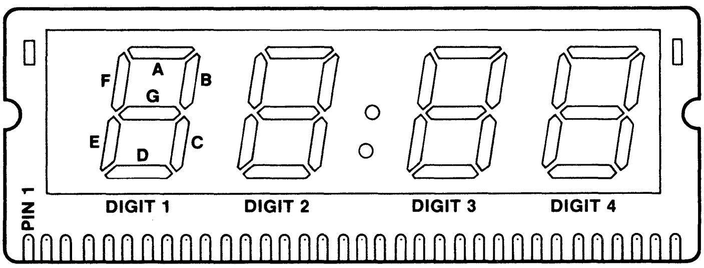
OPTOELECTRONICS

O17



PIN	FCS6400
1	Com. Cath. Digits 1 & 2
2	NC
3	N/C
4	Segment A1 Anode
5	Segment F1 Anode
6	Segment G1 Anode
7	Segment E1 Anode
8	Segment D1
9	Segment C1 Anode
10	Segment B1 Anode
11	Segment F2 Anode
12	Segment G2 Anode
13	Segment A2 Anode
14	Segment B2 Anode
15	Segment E2 Anode
16	Segment D2 Anode
17	Segment C2 Anode
18	Colon Anode
19	Colon Anode
20	Segment F3 Anode
21	Segment G3 Anode
22	Segment A3 Anode
23	Segment B3 Anode
24	Segment D3 Anode
25	Segment E3 Anode
26	Segment C3
27	Segment F4
28	Segment G4 Anode
29	Segment A4 Anode
30	Segment B4 Anode
31	Segment E4 Anode
32	Segment D4 Anode
33	Segment C4 Anode
34	Com. Cath. Digits 3 & 4

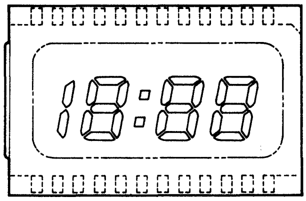
O18



PIN	FCS6401
1	Com. Cath. Digits 1 & 2
2	PM IND. Anode
3	AM IND.
4	N/C
5	N/C
6	N/C
7	N/C
8	N/C
9	Segment C1 Anode
10	Segment B1 Anode
11	Segment F2 Anode
12	Segment G2 Anode
13	Segment A2 Anode
14	Segment B2 Anode
15	Segment E2 Anode
16	Segment D2 Anode
17	Segment C2 Anode
18	Colon Anode
19	Colon Anode
20	Segment F3 Anode
21	Segment G3 Anode
22	Segment A3 Anode
23	Segment B3 Anode
24	Segment D3 Anode
25	Segment E3 Anode
26	Segment C3 Anode
27	Segment F4 Anode
28	Segment G4 Anode
29	Segment A4 Anode
30	Segment B4 Anode
31	Segment E4 Anode
32	Segment D4 Anode
33	Segment C4 Anode
34	Com. Cath. Digits 3 & 4

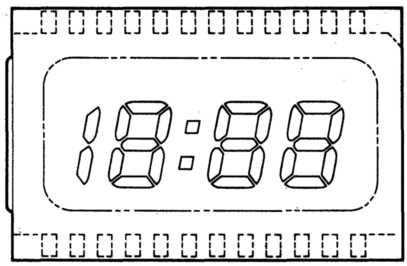
OPTOELECTRONICS

O19



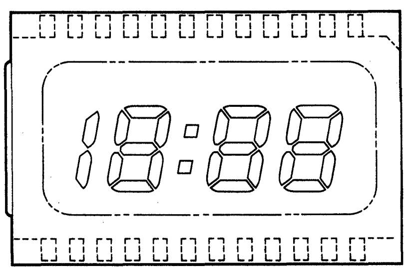
PIN	FLC3503-1		
1	Backplane	13	Segment B_3
2	Half Digit	14	Segment A_3
3	Segment E_1	15	Segment F_3
4	Segment D_1	16	Segment G_3
5	Segment C_1	17	Segment B_2
6	Colons	18	Segment A_2
7	Segment E_2	19	Segment F_2
8	Segment D_2	20	Segment G_2
9	Segment C_2	21	Segment B_1
10	Segment E_1	22	Segment A_1
11	Segment D_1	23	Segment F_1
12	Segment C_1	24	Segment G_1

O20



PIN	FLC3505-1		
1	Backplane	13	Segment B_3
2	Half Digit	14	Segment A_3
3	Segment E_1	15	Segment F_3
4	Segment D_1	16	Segment G_3
5	Segment C_1	17	Segment B_2
6	Colons	18	Segment A_2
7	Segment C_2	19	Segment F_2
8	Segment D_2	20	Segment G_2
9	Segment C_2	21	Segment B_1
10	Segment E_3	22	Segment A_1
11	Segment D_3	23	Segment F_1
12	Segment C_3	24	Segment G_1

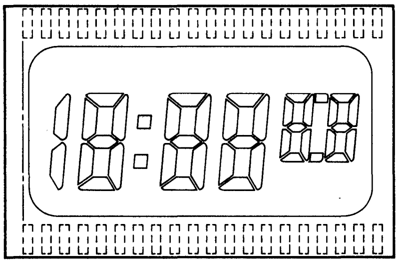
O21



PIN	FLC3505-2		
1	Backplane	13	Segment B_3
2	Half Digit	14	Segment A_3
3	Segment E_1	15	Segment F_3
4	Segment D_1	16	Segment G_3
5	Segment C_1	17	Segment B_2
6	Colon	18	Segment A_2
7	Segment E_2	19	Segment F_2
8	Segment D_2	20	Segment G_2
9	Segment C_2	21	Segment B_1
10	Segment E_1	22	Segment A_1
11	Segment D_1	23	Segment F_1
12	Segment C_1	24	Segment G_1

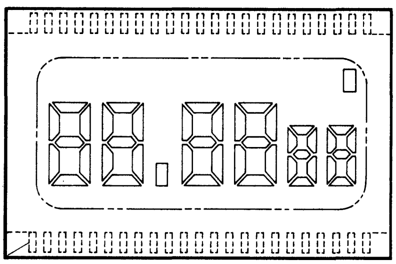
OPTOELECTRONICS

O22



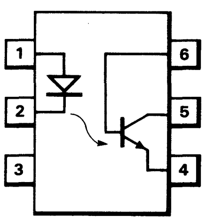
PIN	FLC5505-1				
1	Backplane	15	Segment D_4	29	Segment B_3
2	Segment E_1	16	Segment C_4	30	Segment A_3
3	Segment D_1	17	Segment B_5	31	Segment F_3
4	Segment C_1	18	Segment E_5	32	Segment B_2
5	Segment G_2	19	Segment D_5	33	Segment A_2
6	Segment E_2	20	Segment C_5	34	Segment F_2
7	Segment D_2	21	Segment G_5	35	Colon
8	Segment C_2	22	Segment B_5	36	Segment B_1
9	Segment G_3	23	Segment A_5	37	Segment A_1
10	Segment E_3	24	Segment F_5	38	Segment F_1
11	Segment D_3	25	Segment G_4	39	Segment G_1
12	Segment C_3	26	Segment B_4	40	Half Digit
13	Segment G_4	27	Segment A_4		
14	Segment E_4	28	Segment F_4		

O23



PIN	FLC6005-2				
1	Segment E_1	17	Segment C_5	33	Segment B_4
2	Seg. D_1, A_1	18	Segment E_6	34	Segment A_4
3	Segment C_1	19	Segment D_6	35	Segment F_4
4	Segment E_1	20	Segment J_6	36	Segment G_4
5	Segment D_2	21	Segment C_6	37	Segment B_3
6	Segment C_2	22	Segment G_6	38	Segment F_3
7	Period	23	Backplane	39	Segment G_3
8	Segment E_3	24	Indicator	40	Segment B_2
9	Seg. A_3, D_3	25	Segment B_6	41	Segment A_2
10	Segment C_3	26	Segment A_6	42	Segment F_2
11	Segment E_4	27	Segment F_6	43	Segment G_2
12	Segment D_4	28	Segment B_5	44	Segment B_1
13	Segment C_4	29	Segment A_5	45	Segment F_1
14	Segment E_5	30	Segment H_5	46	Segment G_1
15	Segment J_5	31	Segment F_5		
16	Segment D_5	32	Segment G_5		

O24

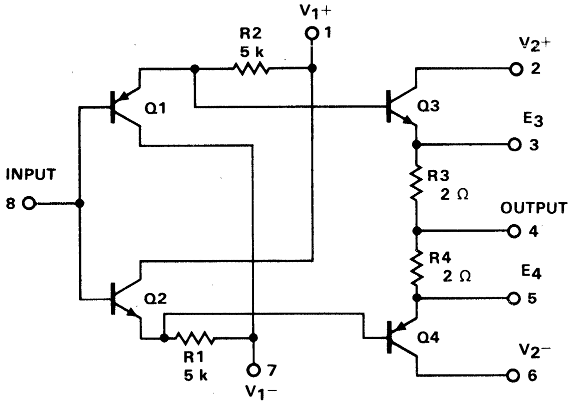


PIN		
1	Anode (+)	Input Diode
2	Cathode (-)	
3	NC	
4	Emitter	Output npn Phototransistor
5	Collector	
6	Base	

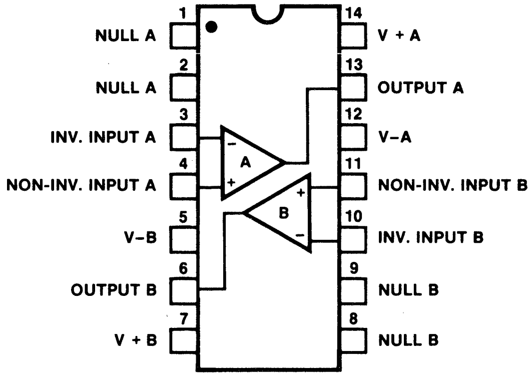
13

HYBRID

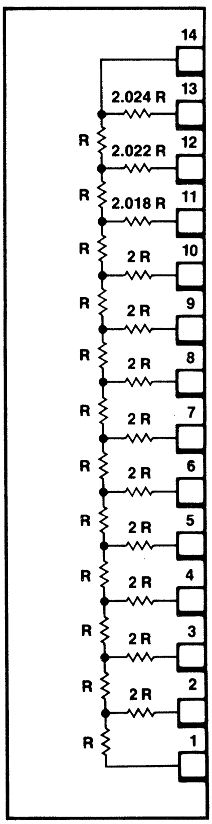
H1
SH0002



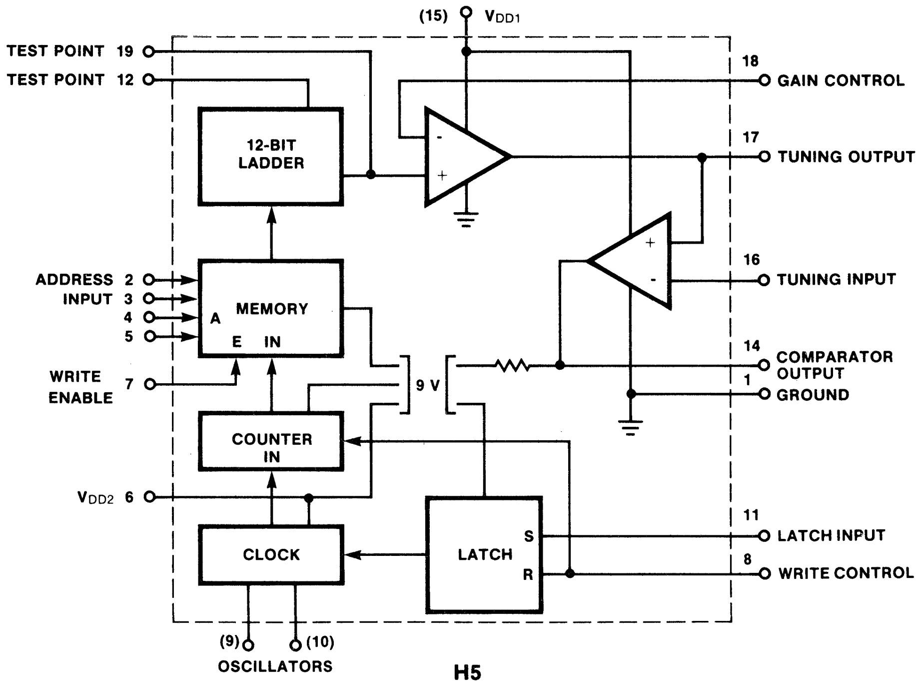
H2
SH2714



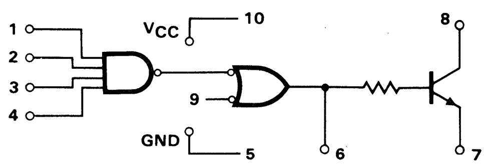
H3
SH1552



H4
SH1549

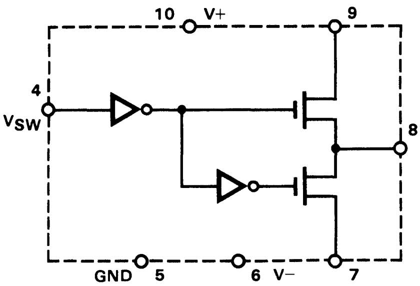


H5
SH2001, SH2002
SH2200, SH2201

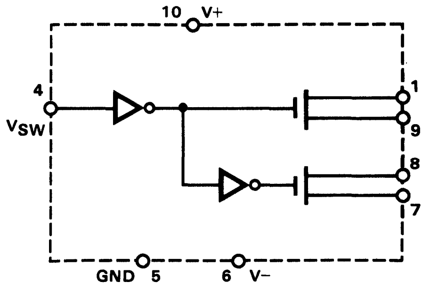


HYBRID

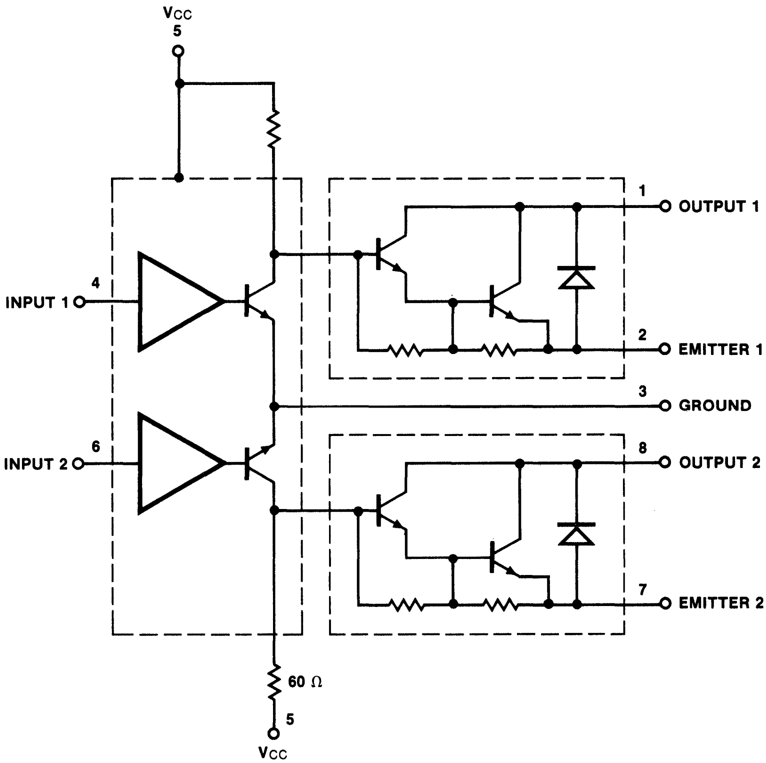
H6
SH3002



H7
SH3003

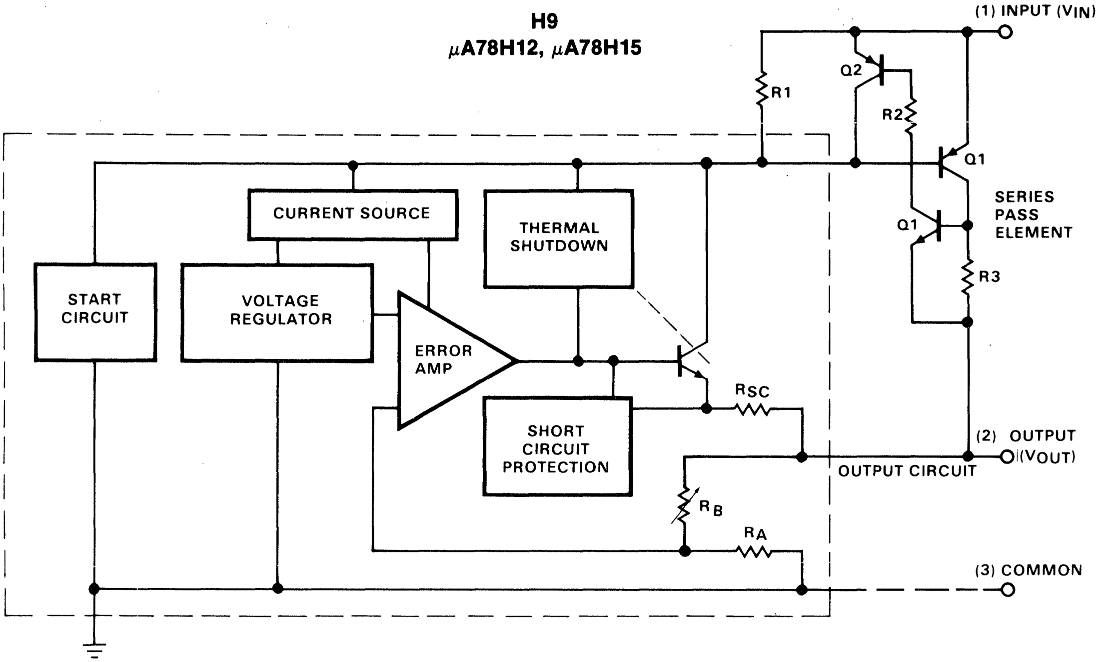


H8
SH3011

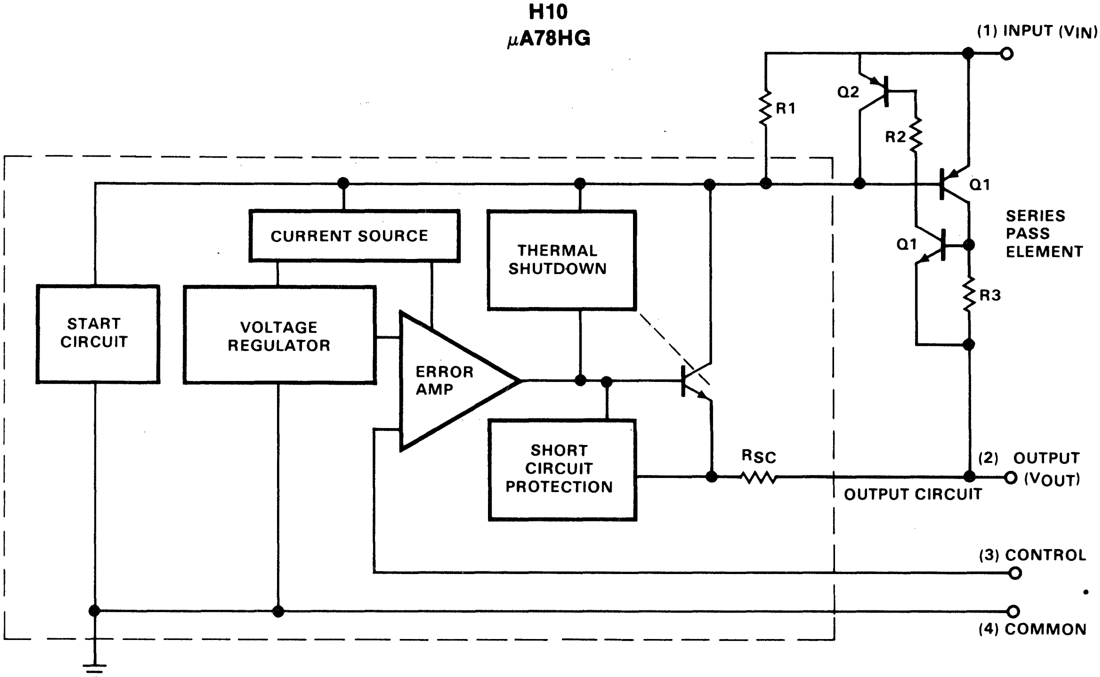


HYBRID

H9
μA78H12, μA78H15



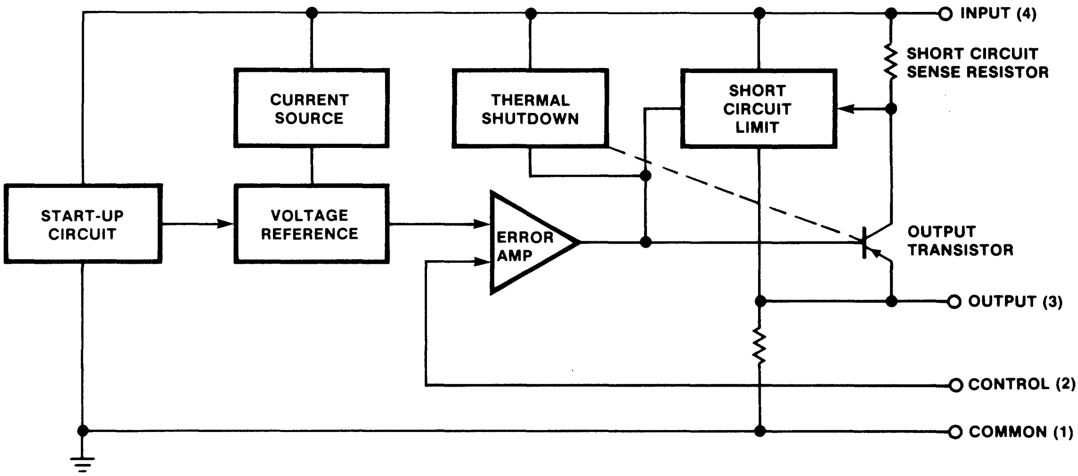
H10
μA78HG



HYBRID

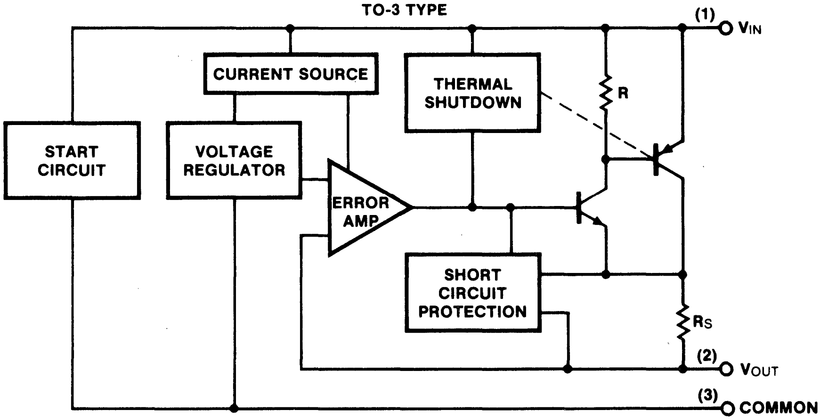
H11
μA79HG

4 PIN TO-3 TYPE



H12
μA78H05, μA78H05A, μA78P05
SH123, SH223, SH323

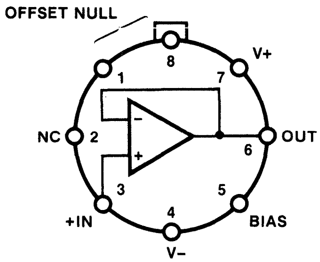
TO-3 TYPE



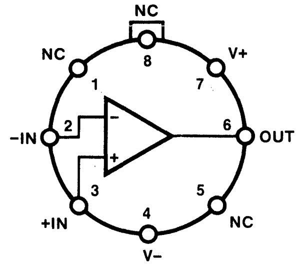
13

LINEAR

L-OA1
μA302, μA310, μA714C/E/L

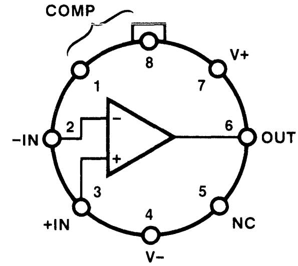


L-OA2
μA307

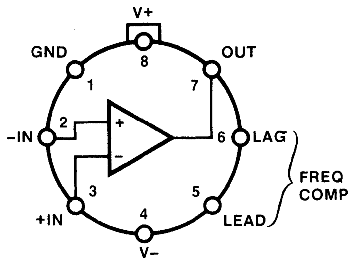


Metal Can and Mini-Dip Connection Shown

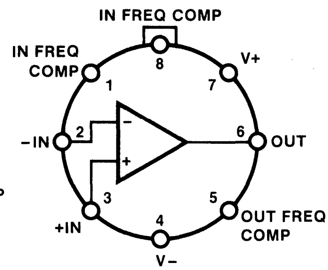
L-OA3
μA308, μA308A



L-OA4
μA702C

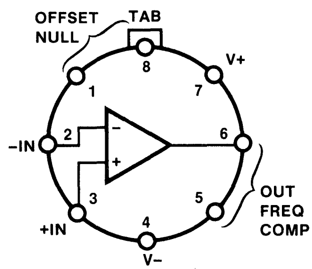


L-OA5
μA709C

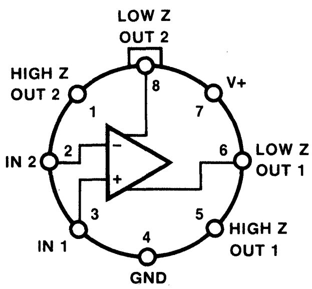


Metal Can and Mini-Dip Connection Shown

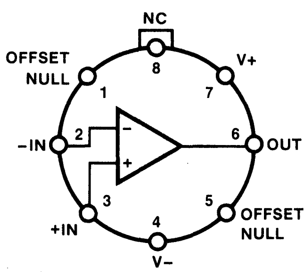
L-OA6
μA725C/E



L-OA7
μA730C

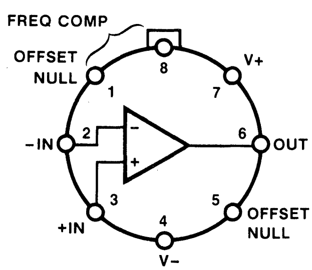


L-OA8
μA318, μAF355, μAF345, μA740A/E, μA741C/E



Metal Can and Mini-Dip Connection Shown

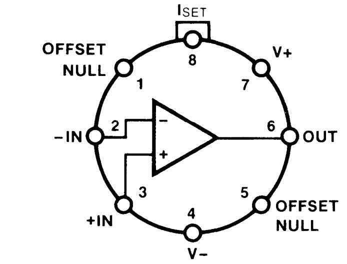
L-OA9
μA301A, μA748C, μA777C



Metal Can and Mini-Dip Connection Shown

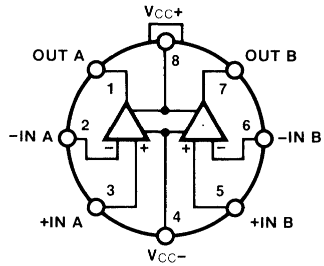
LINEAR

L-OA10
μA776C, μA798C, μA1458



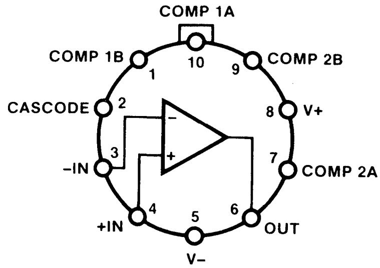
Metal Can and Mini-Dip Connection Shown

L-OA11
μA4558

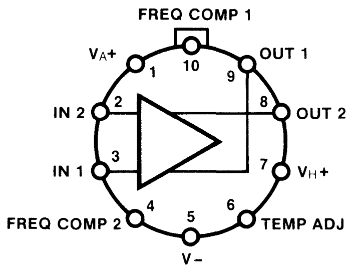


Metal Can and Mini-Dip Connection Shown

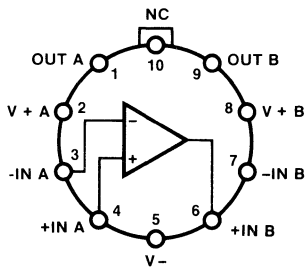
L-OA12
μA715C



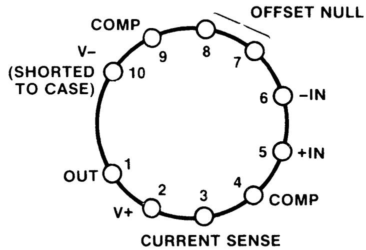
L-OA13
μA727C



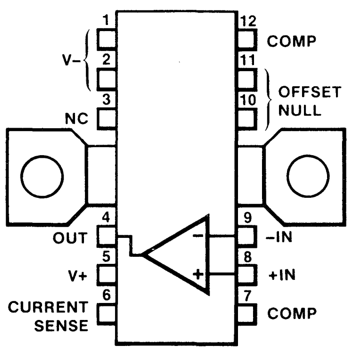
L-OA14
μA747C/E



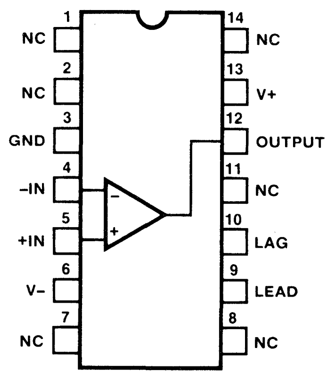
L-OA15
μA791C



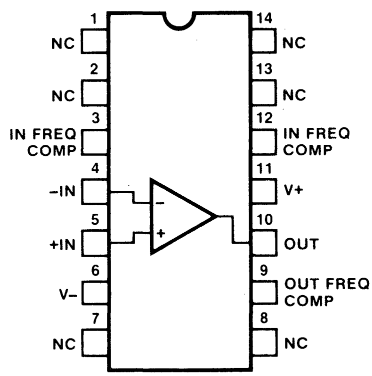
L-OA16
μA791C



L-OA17
μA702C, μA4136



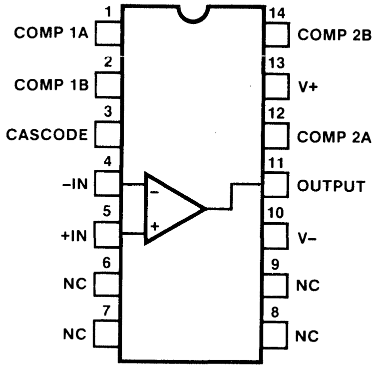
L-OA18
μA709C



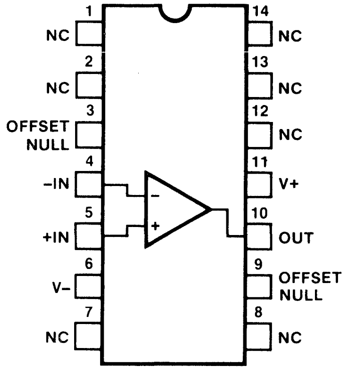
13

LINEAR

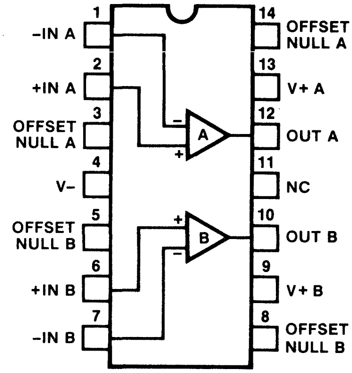
L-OA19
μA715C



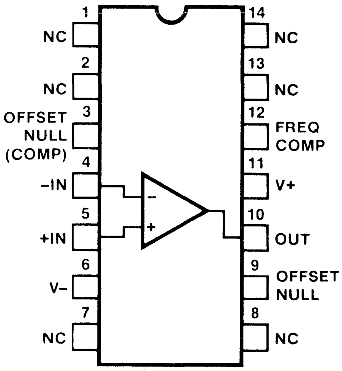
L-OA20
μA741C/E



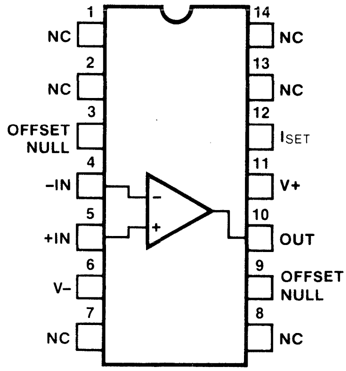
L-OA21
μA747C/E



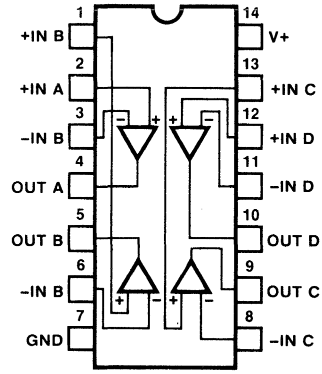
L-OA22
μA301A, μA748, μA777C



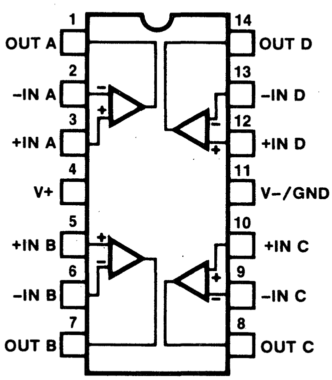
L-OA23
μA776C



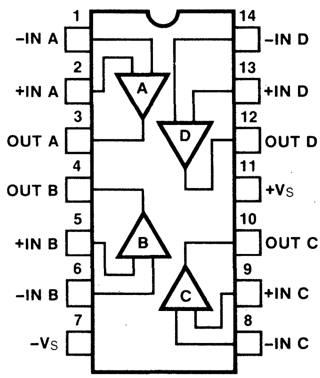
L-OA24
μA3401



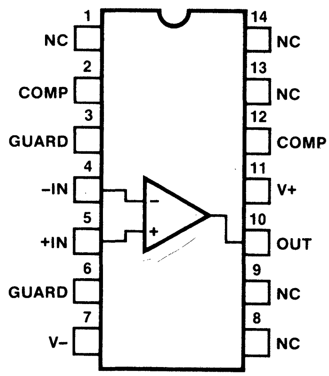
L-OA25
μA324, μA348, μA3403



L-OA26
μA4136

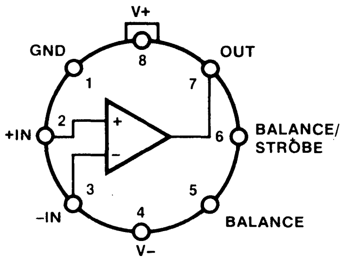


L-OA27
μA308, μA308A



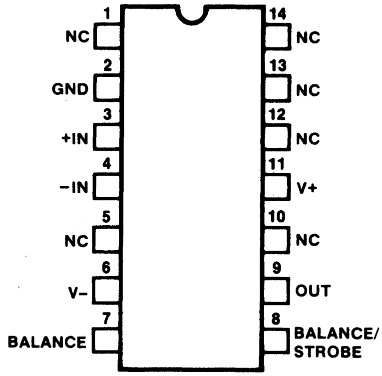
LINEAR

L-OA28
μAF111, μAF211, μAF311, μA111, μA211, μA311

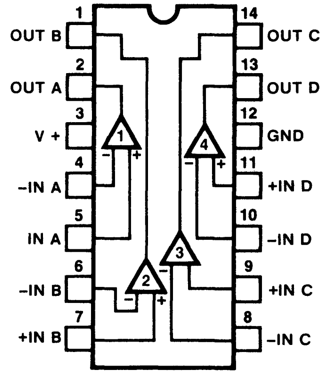


Metal Can and Mini-Dip Connection Shown

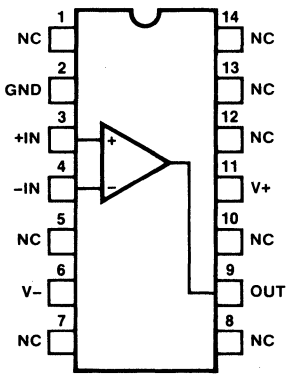
L-OA29
μAF111, μAF211, μAF311, μA111, μA211, μA311



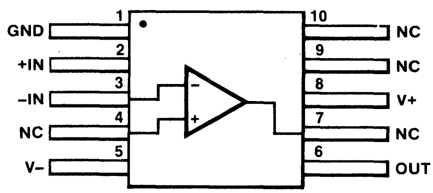
L-OA30
μA139/A, μA239/A, μA339/A, μA775, μA2901, μA7302



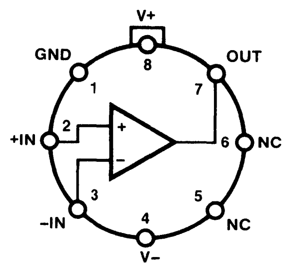
L-OA31
μA710



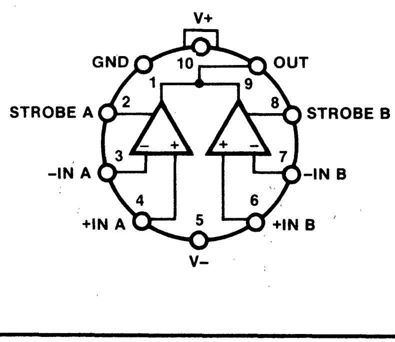
L-OA32
μA710



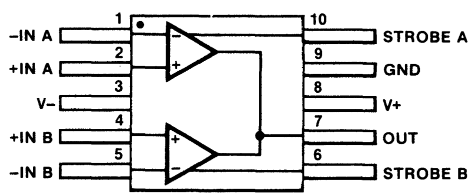
L-OA33
μA710



L-OA34
μA711



L-OA35
μA711



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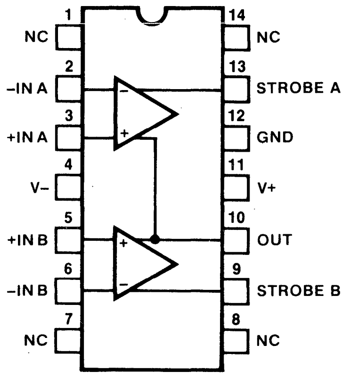
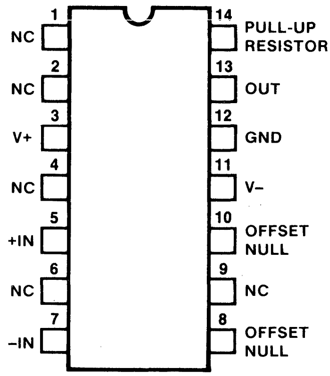
LINEAR

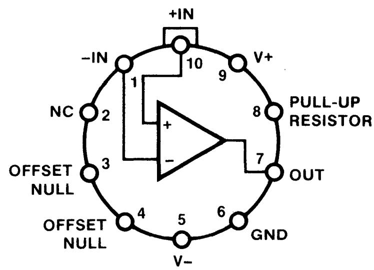
L-OA36
μA711



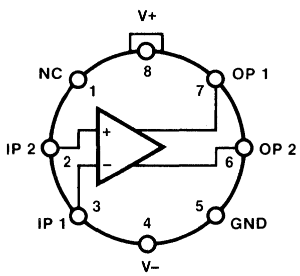
L-OA37
μA734



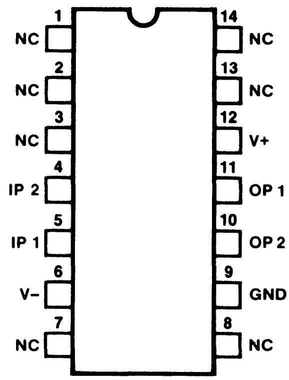
L-OA38
μA734



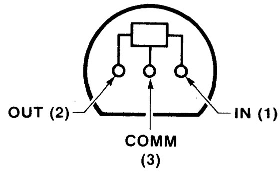
L-OA39
μA760



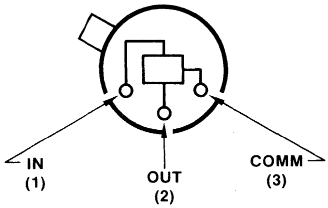
L-OA40
μA760



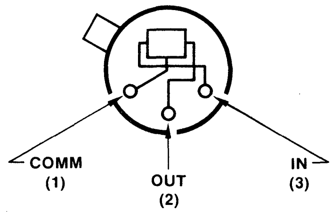
L-VR1
μA78LXX



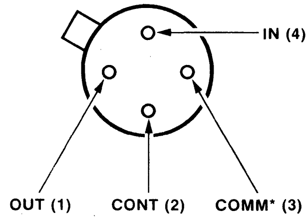
L-VR2
μA78LXX, μA78MXX



L-VR3
μA79MXX

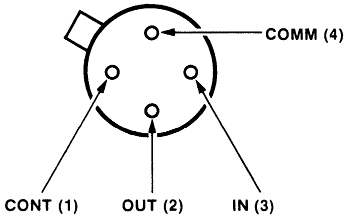


L-VR4
μA78MG

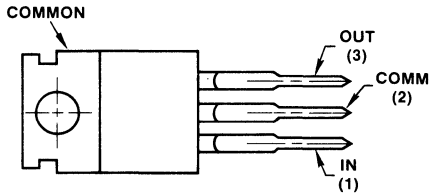


LINEAR

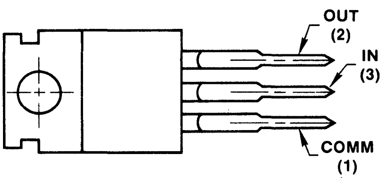
L-VR5
μA79MG



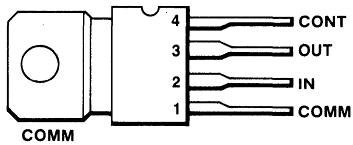
L-VR6
μA78CB, μA78MXX,
μA78CXX, μA78XX



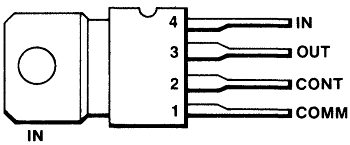
L-VR7
μA79MXX, μA79XX



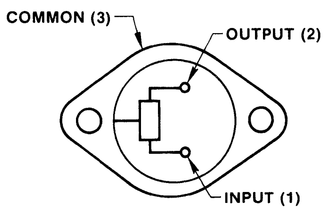
L-VR8
μA78G, μA78MG



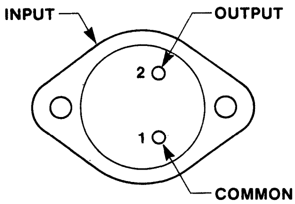
L-VR9
μA79G, μA79MG



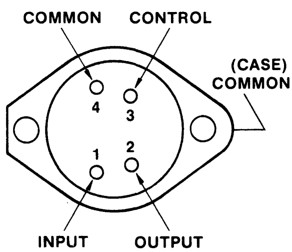
L-VR10
μA78CB,
μA78XX, μA109, μA209, μA309



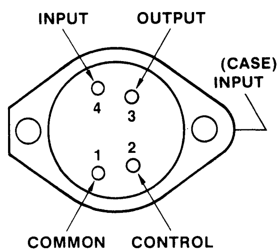
L-VR11
μA79XX



L-VR12
μA78G



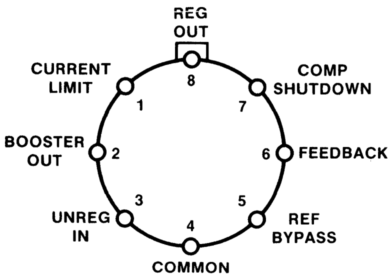
L-VR13
μA79G, μA79HG



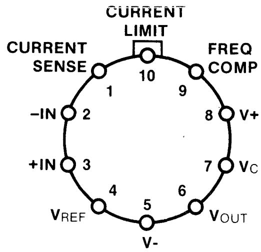
13

LINEAR

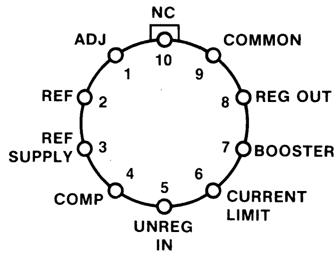
L-VR14
μA105, μA305/A



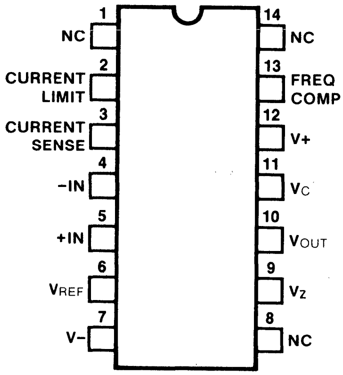
L-VR15
μA723



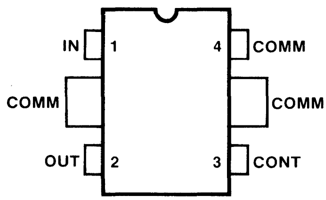
L-VR16
μA104, μA304



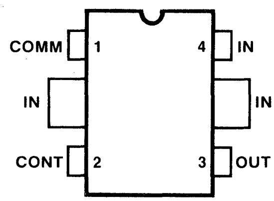
L-VR17
μA723



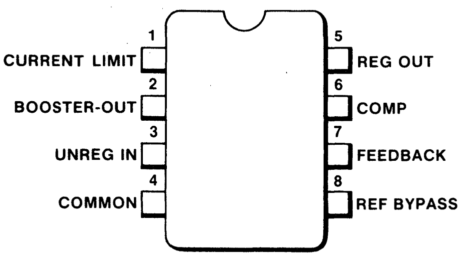
L-VR18
μA78MG



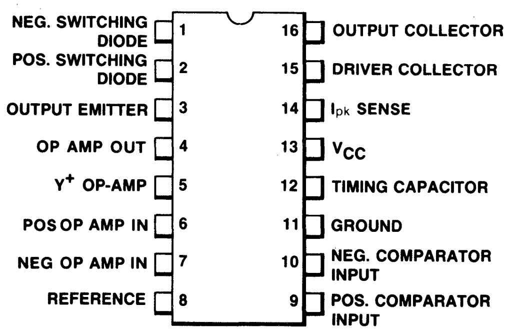
L-VR19
μA79MG



L-VR20
μA376

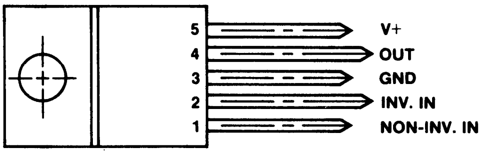


L-VR21
μA78S

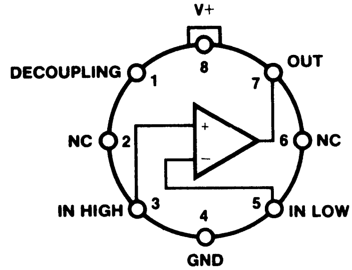


LINEAR

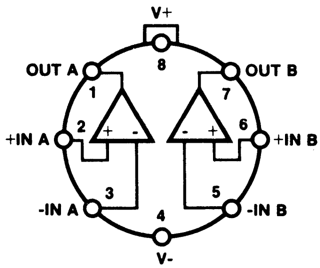
L-C1
TD2002, TDA2002A



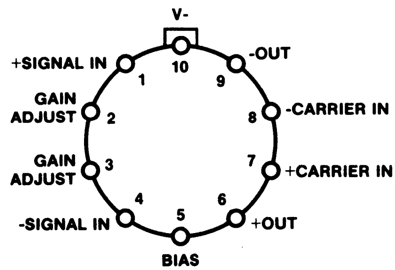
L-C2
μA703



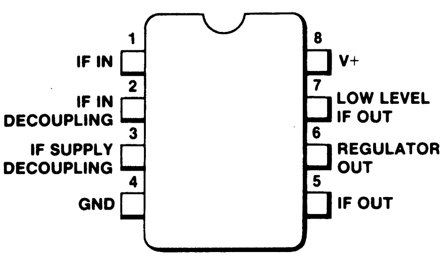
L-C3
μA749



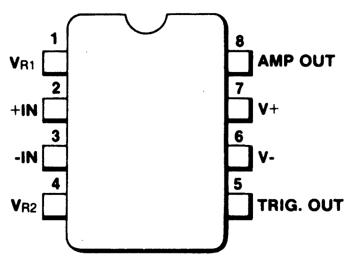
L-C4
μA796



L-C5
μA753

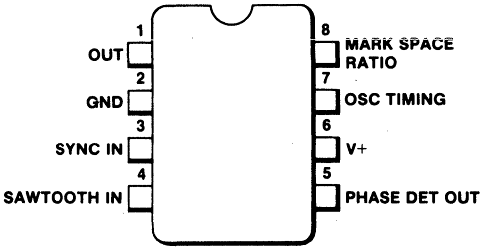


L-C6
μA7390

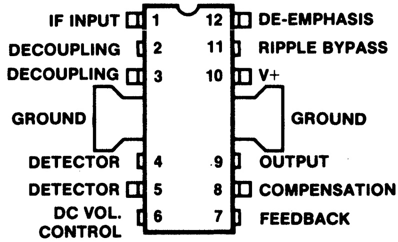


LINEAR

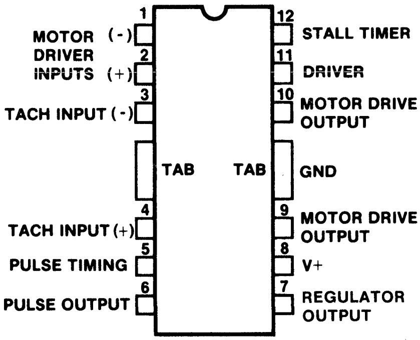
L-C7
μA1391, μA1394



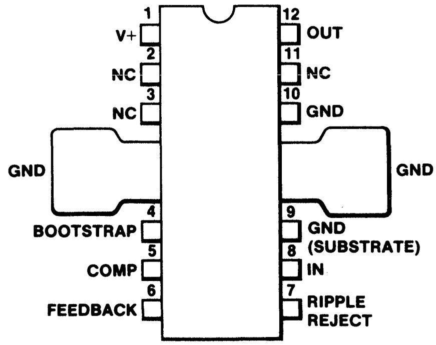
L-C8
TDA1190, TDA1190Z



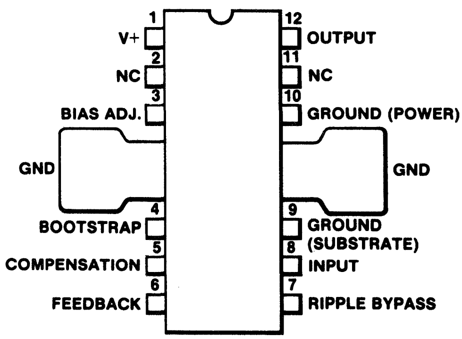
L-C9
μA7391



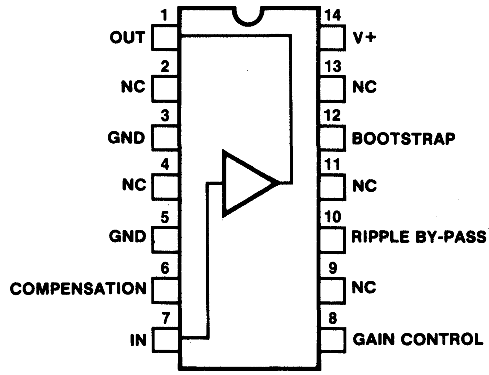
L-C10
TBA810S/AS/DS/DAS, μA783



L-C11
TBA800, TBA800A

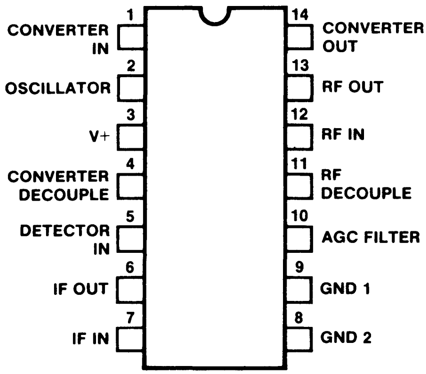


L-C12
μA706A, μA706B
TBA641A12, TBA641B11

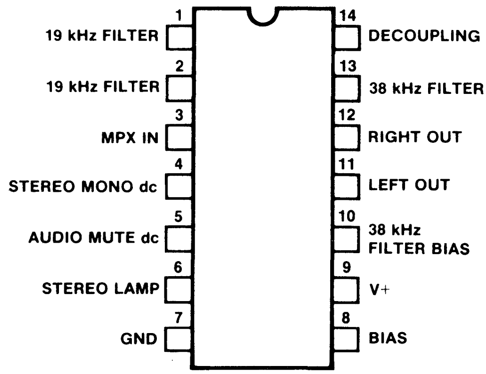


LINEAR

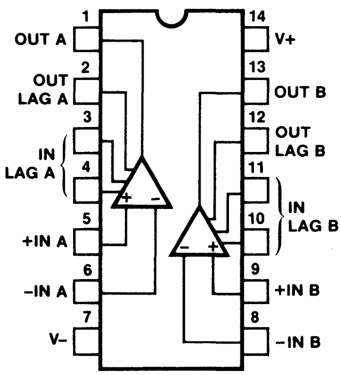
L-C13
μA720



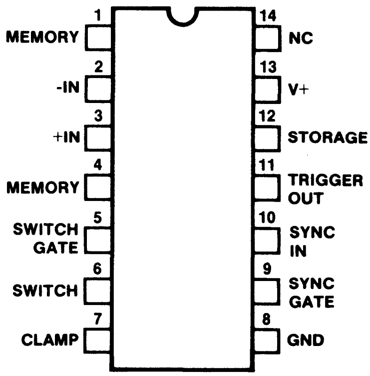
L-C14
μA732



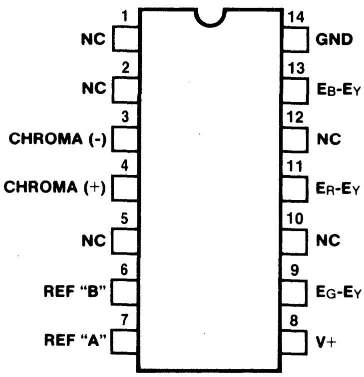
L-C15
μA739



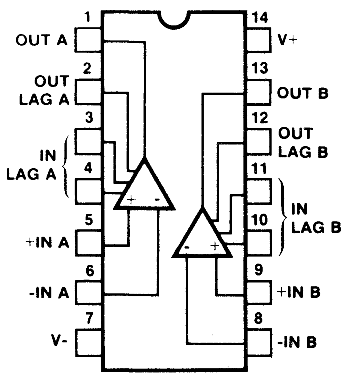
L-C16
μA742



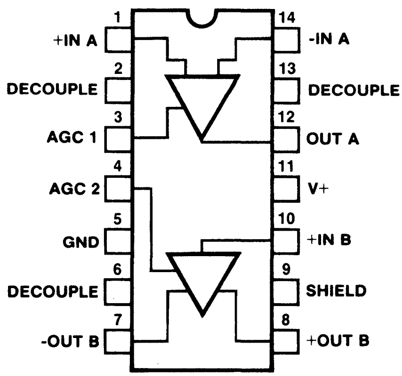
L-C17
μA746



L-C18
μA749



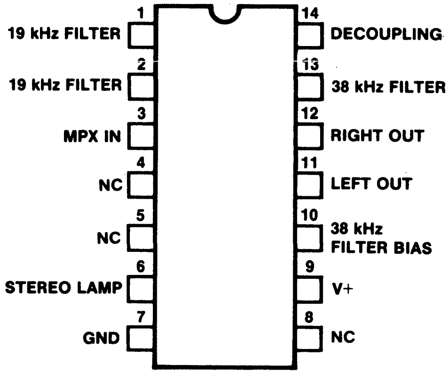
L-C19
μA757



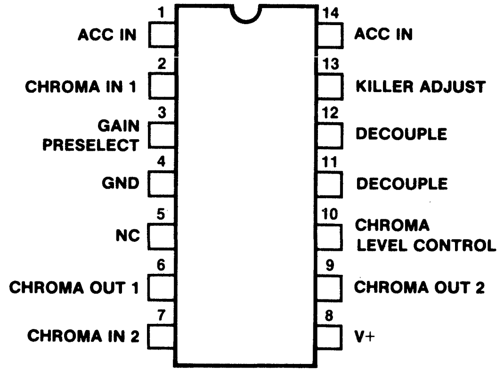
13

LINEAR

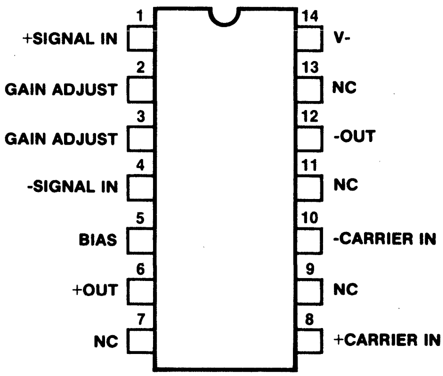
L-C20
μA767



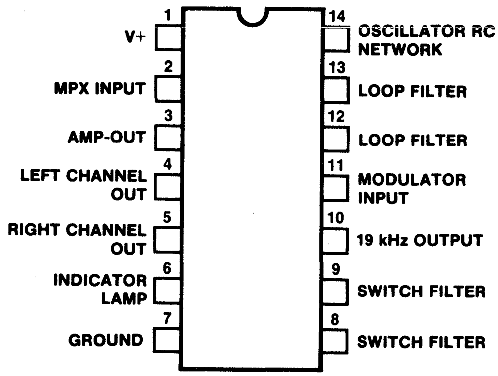
L-C21
μA781



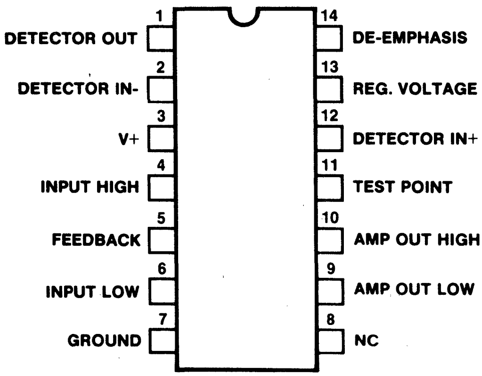
L-C22
μA796



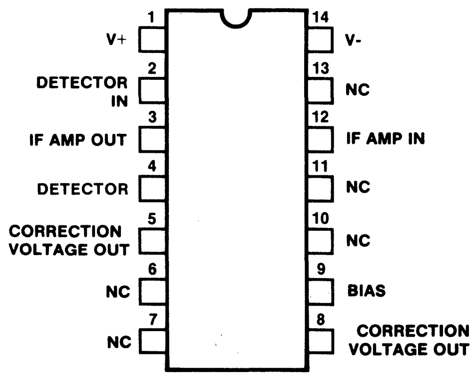
L-C23
μA1310



L-C24
μA2136

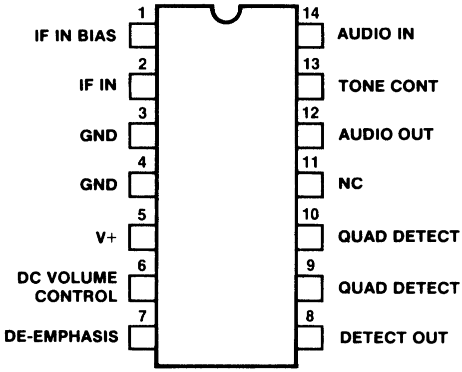


L-C25
μA3064

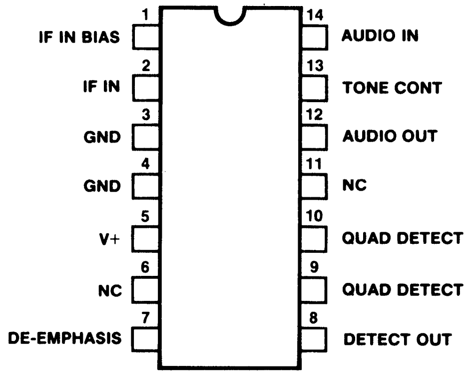


LINEAR

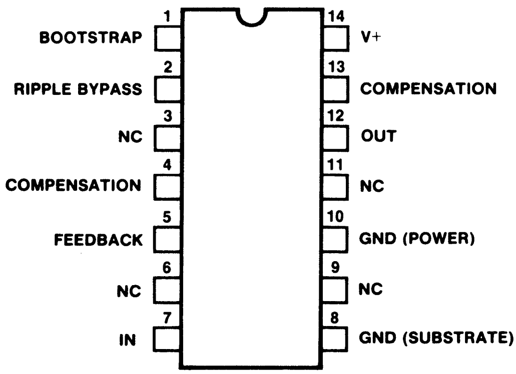
L-C26
μA3065



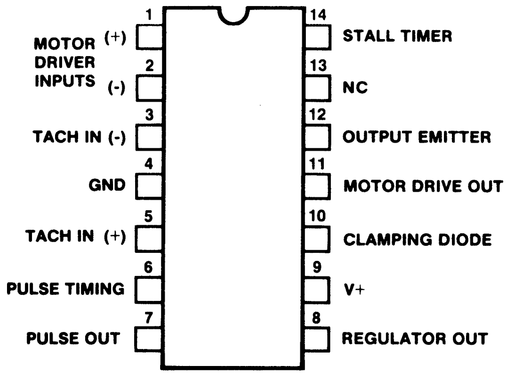
L-C27
μA3075



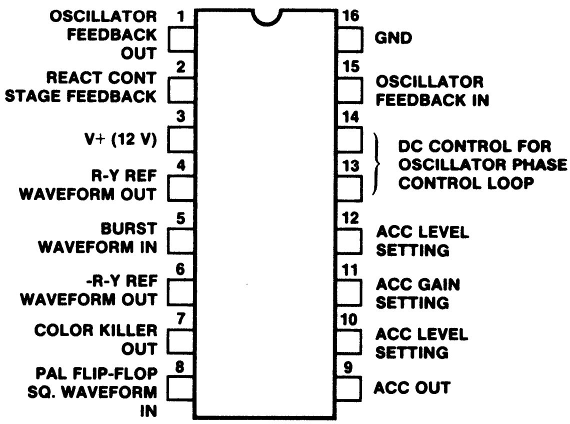
L-C29
TBA820, TBA820L



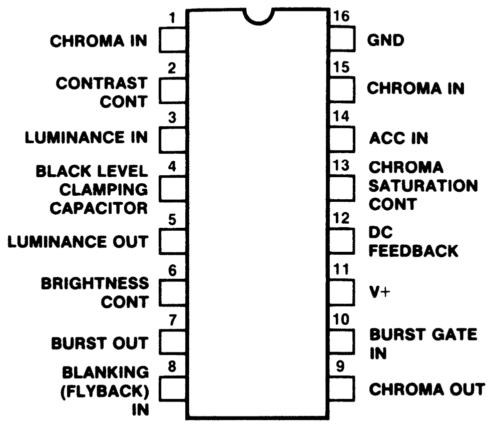
L-C30
μA7392



L-C31
TBA540

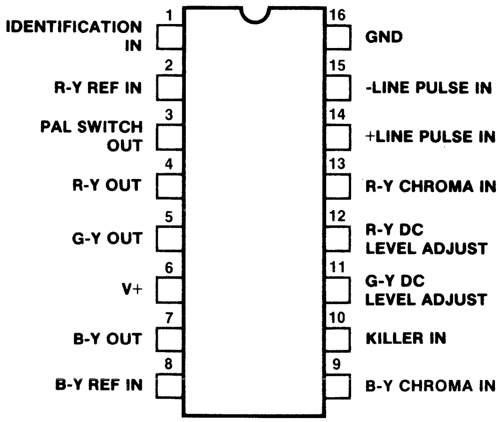


L-C32
TBA560C

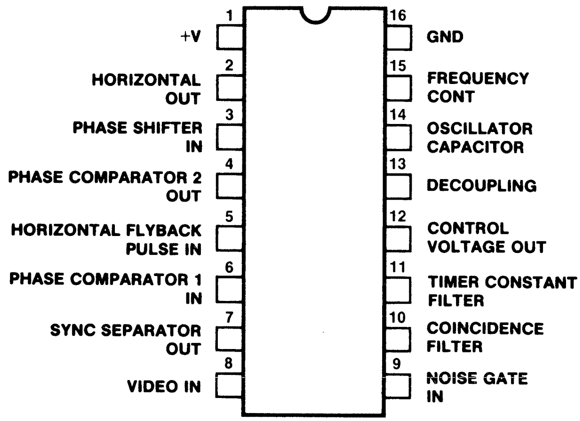


LINEAR

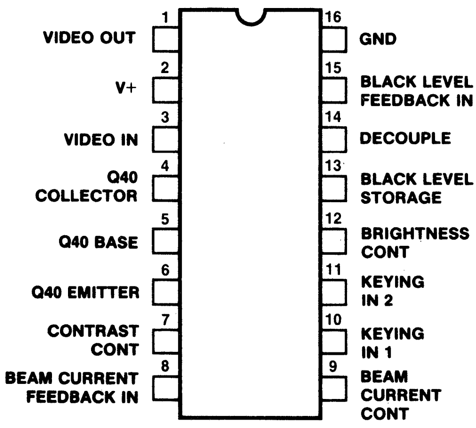
L-C33
TAA630S



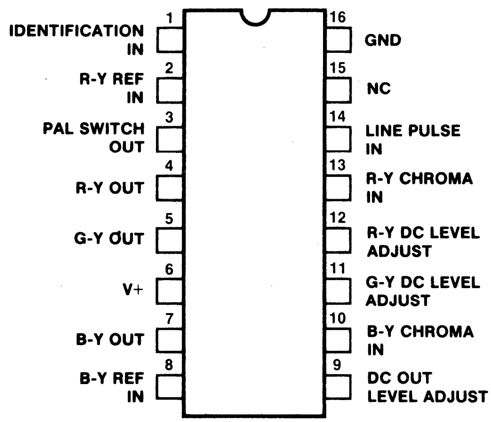
L-C34
TBA920, TBA920S



L-C35
TBA970

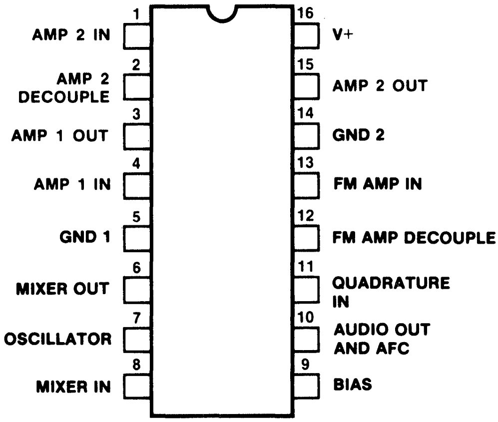


L-C36
TBA990

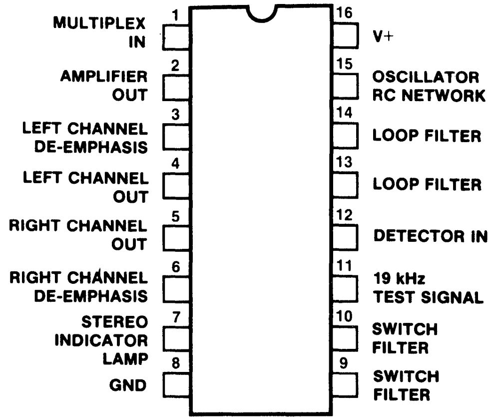


LINEAR

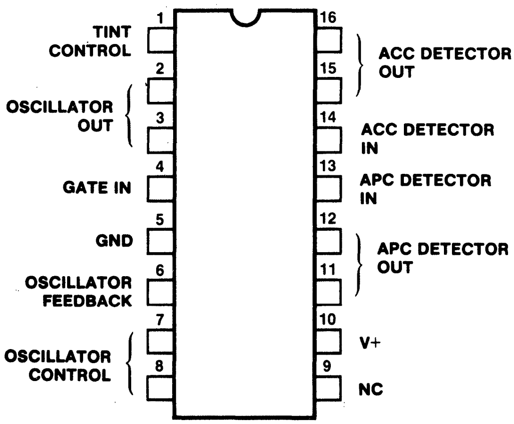
L-C37
μA721



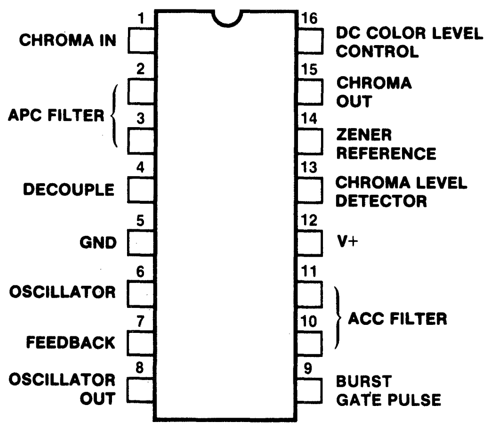
L-C38
μA758



L-C39
μA780



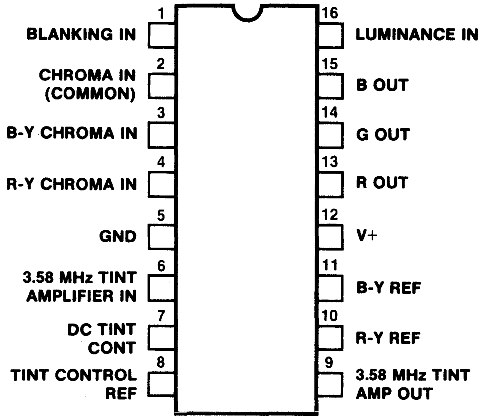
L-C40
μA787



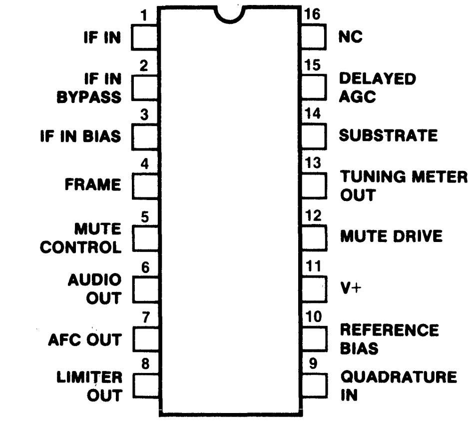
13

LINEAR

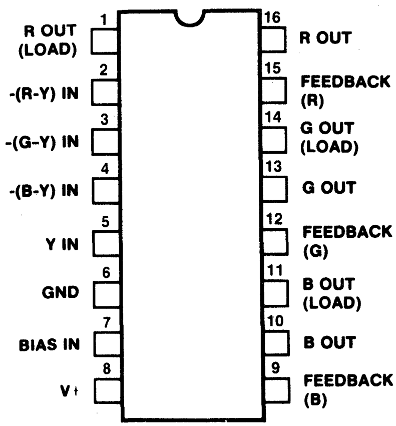
L-C41
μA788



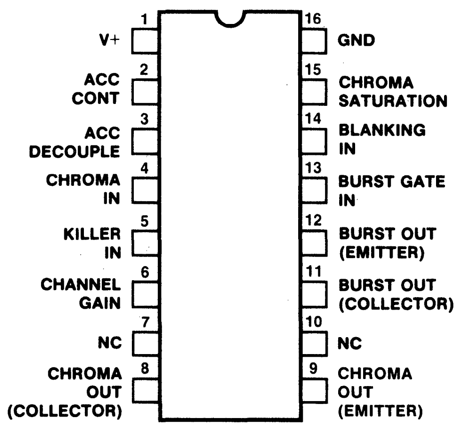
L-C42
μA3089



L-C43
TBA530

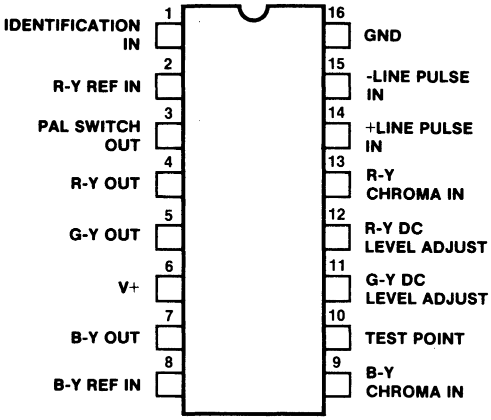


L-C44
TBA510

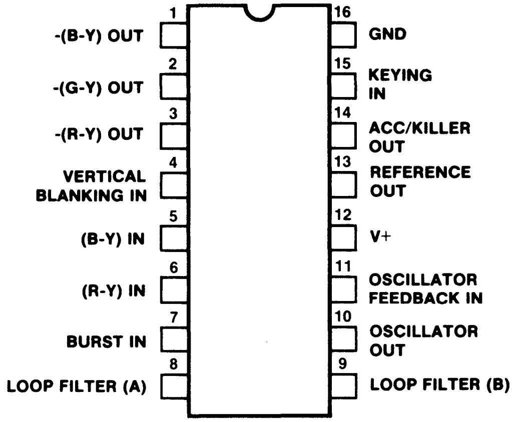


LINEAR

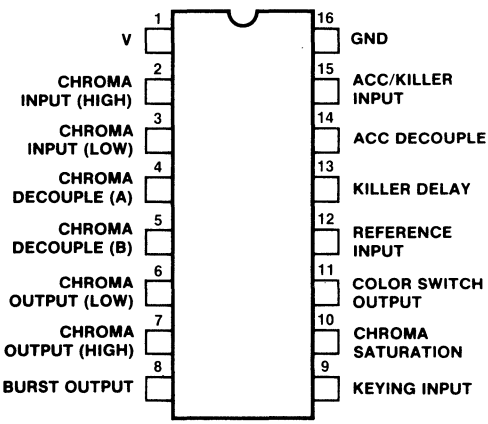
L-C45
TBA520



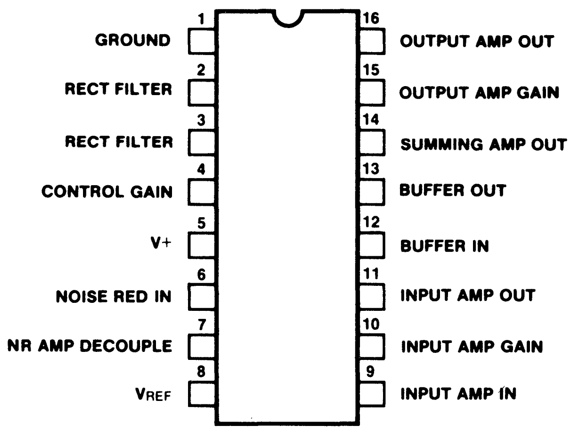
L-C46
TDA2521



L-C47
TDA2510



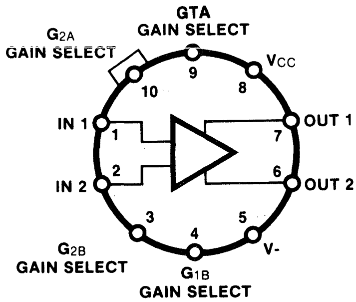
L-C48
μA7300



13

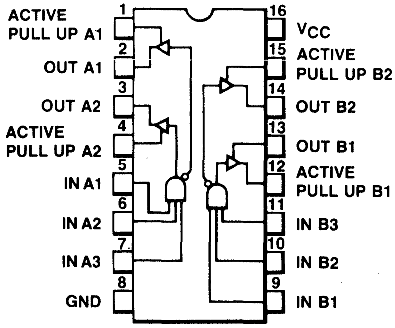
INTERFACE

I1
μA733

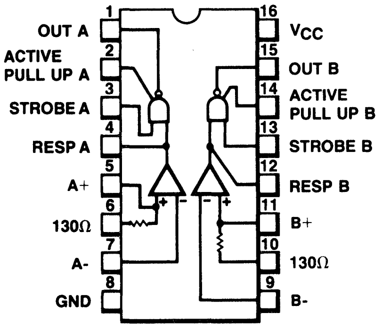


Flatpak and Dip Not Shown

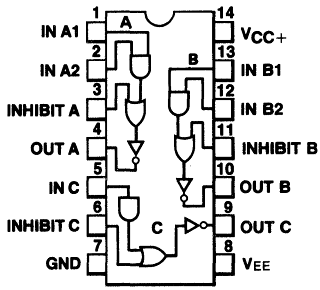
I2
9614



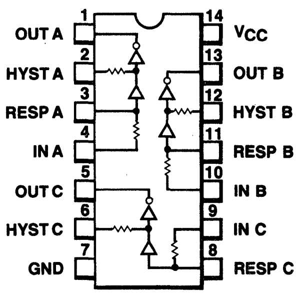
I3
9615



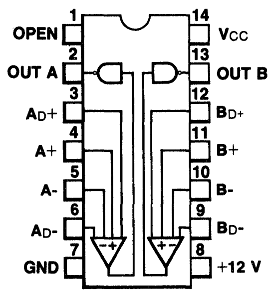
I4
9616



I5
9617

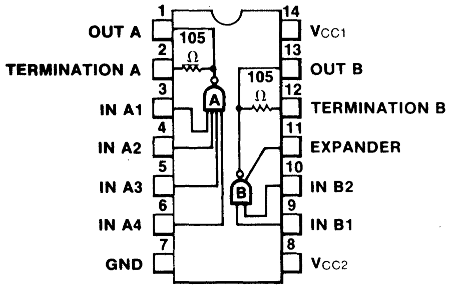


I6
9620

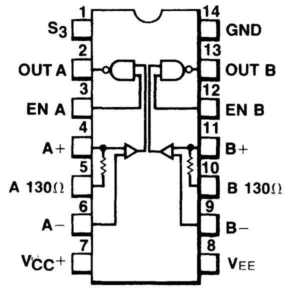


INTERFACE

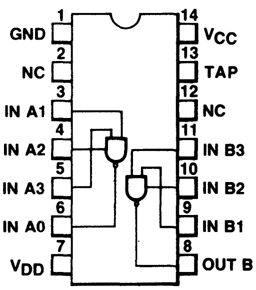
I7
9621



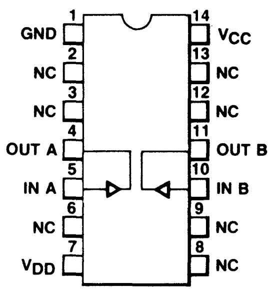
I8
9622



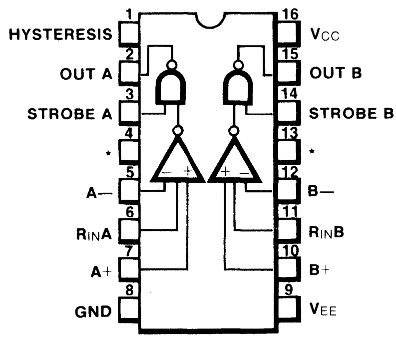
I9
9624



I10
9625

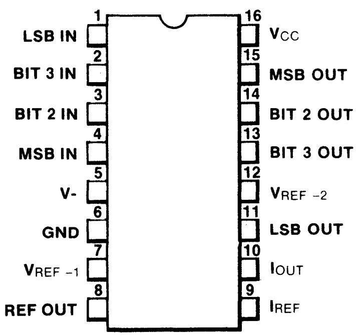


I11
9627

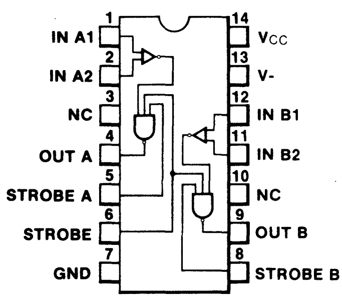


*Internal Connection

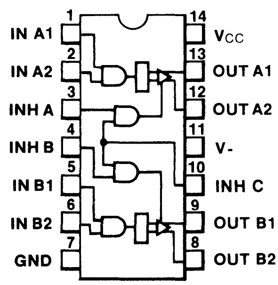
I12
9650



I13
55/75107, 55/75108
75207, 75208



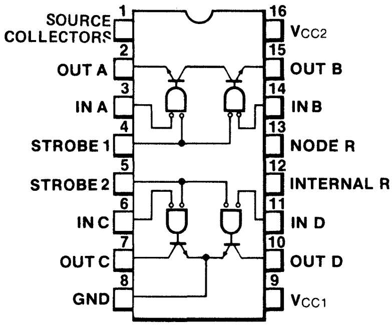
I14
55/75109, 55/75110



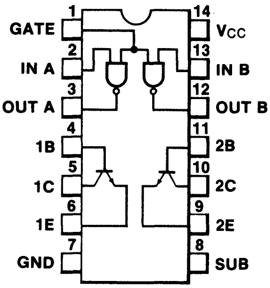
13

INTERFACE

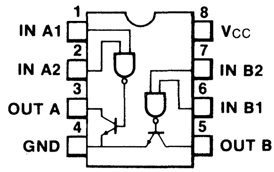
I15
55/75325



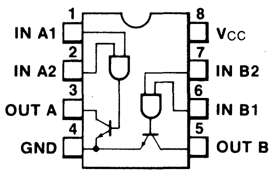
I16
55/75430, 55/75450, 55/75460



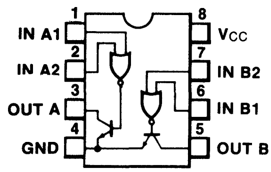
I17
55/75431, 55/75451 55/75461, 55/75471



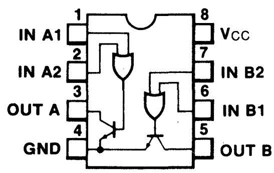
I18
55/75432, 55/75452, 55/7562, 55/7572



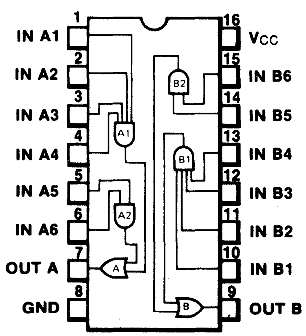
I19
55/75433, 55/75453, 55/75463, 55/75473



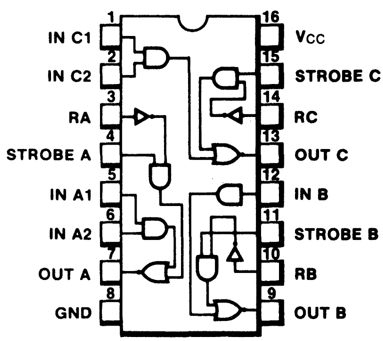
I20
55/75434, 55/75454, 55/75464, 55/75474



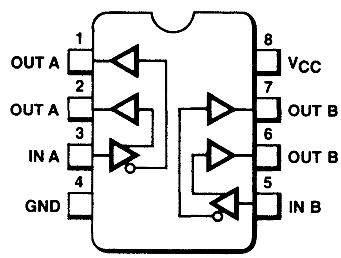
I21
8T13, 8T23, 55/75121, 75123



I22
8T14, 8T24, 55/75122, 75124

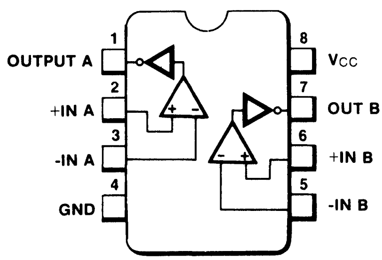


I23
9612

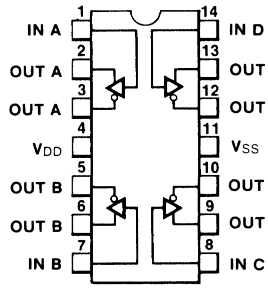


INTERFACE

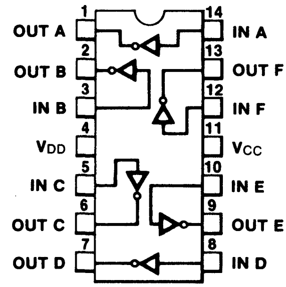
I24
9613



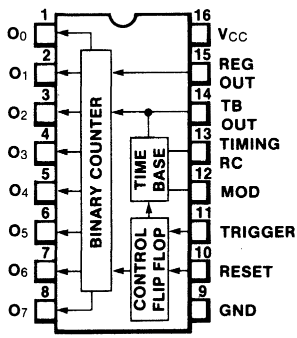
I25
75491



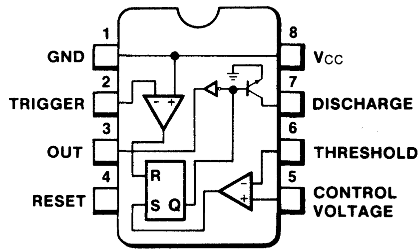
I26
75492, 9664



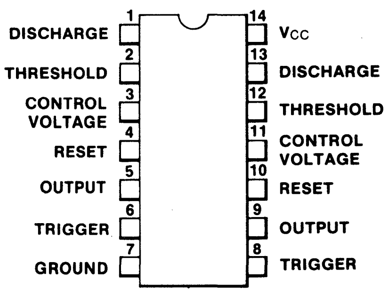
I27
μA2240



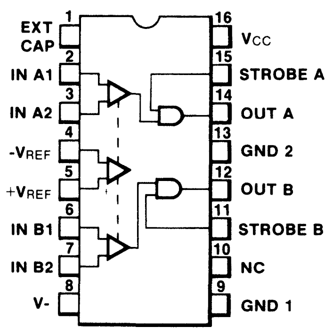
I28
μA555



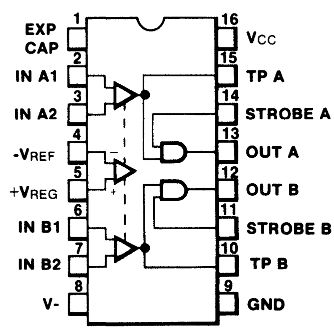
I29
μA556



I30
7524, 7525

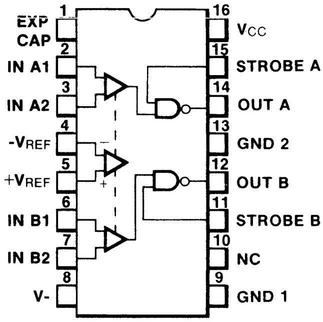


I31
7528, 7529

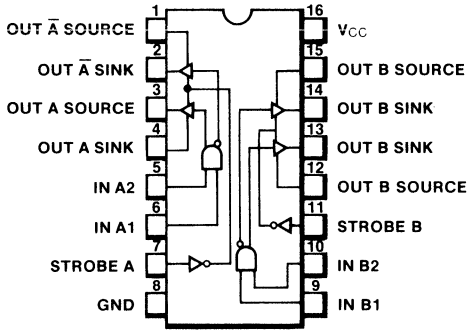


INTERFACE

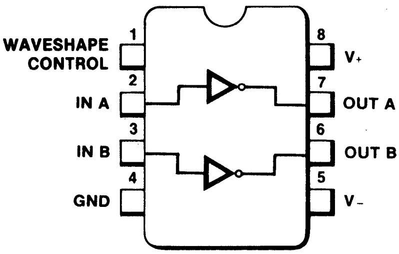
132
7534, 7535, 75234, 75235



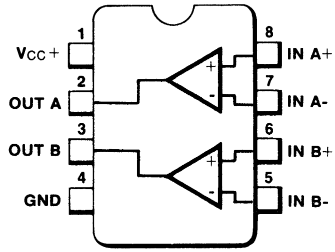
133
9634



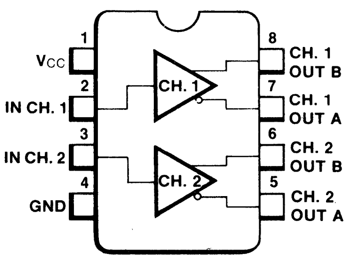
134
9636



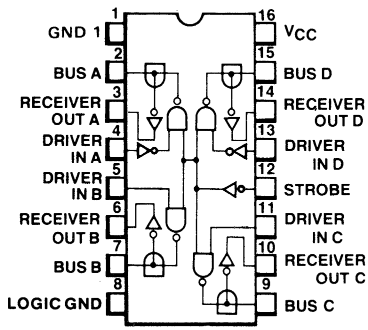
135
9637A



136
9638

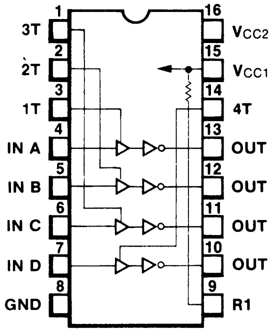


137
9640/26S10



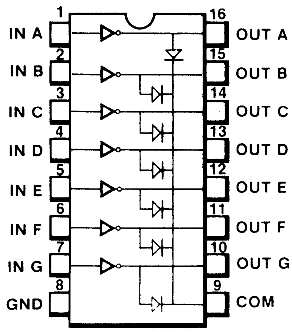
INTERFACE

138
75154

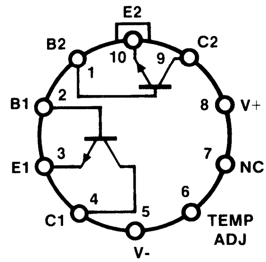


Minidip Not Shown

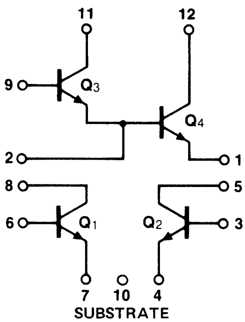
139
9665, 9666, 9667, 9668



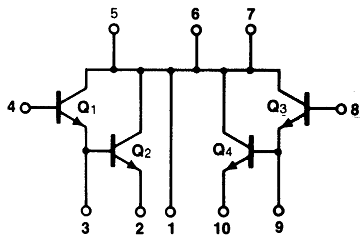
140
μA726



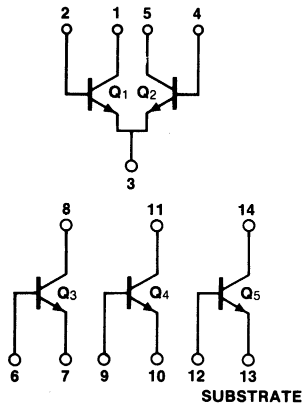
141
μA3018, μA3018A



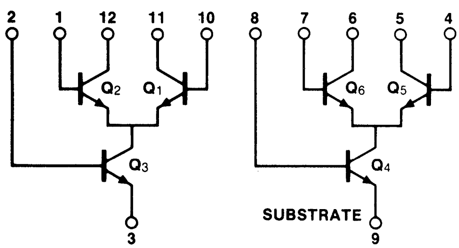
142
μA3036



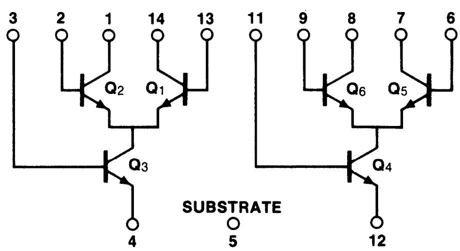
143
μA3045, μA3046, μA3086



144
μA3026



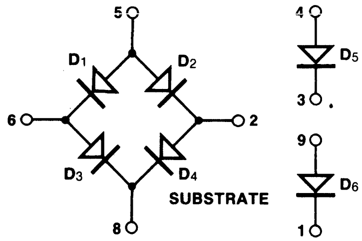
145
μA3054



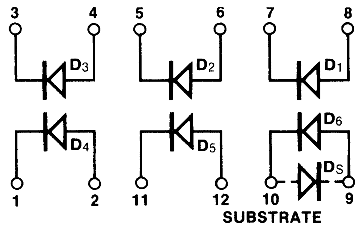
13

INTERFACE

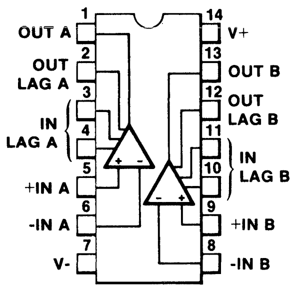
I46
μA3039



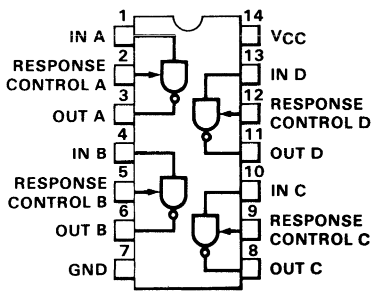
I47
μA3019



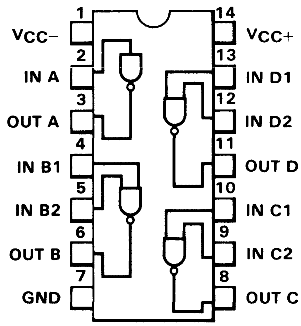
I48
μA739



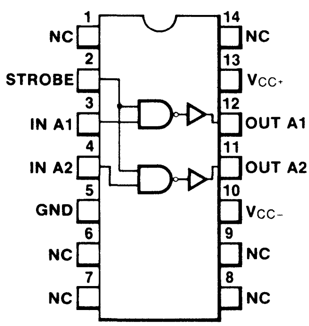
I49
μA1488



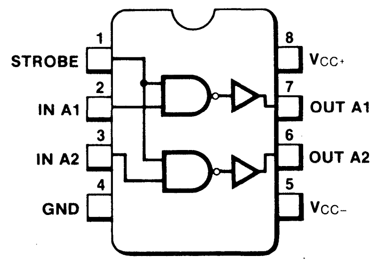
I50
μA1489, μA1489A



I51
75150

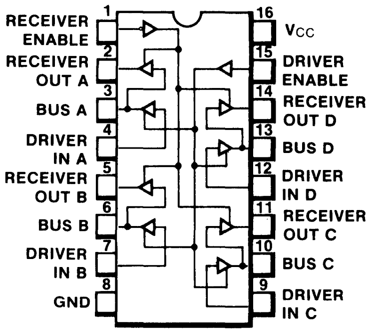


I52
75150

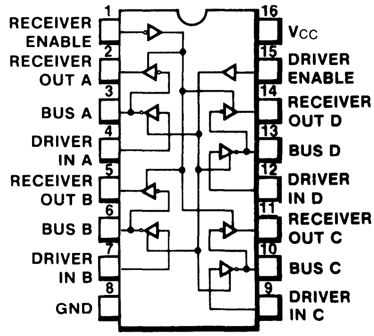


INTERFACE

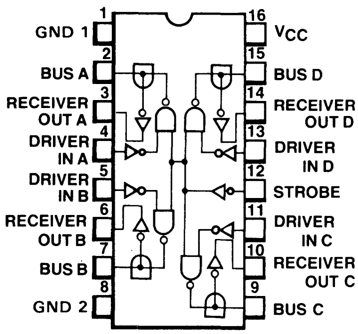
153
8T26



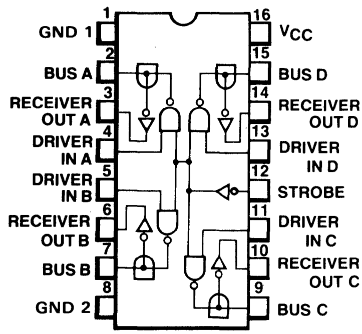
154
8T28



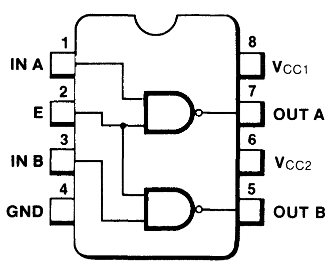
155
9641/26S11



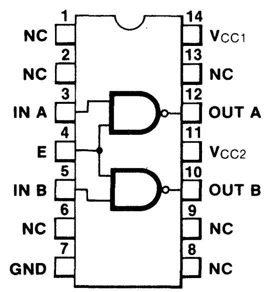
156
9642



157
9643, 9644



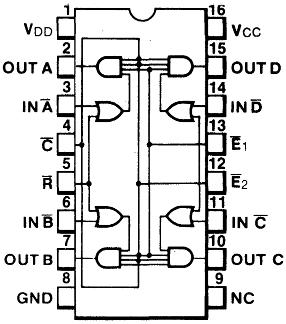
158
9643



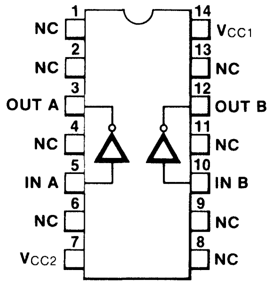
13

INTERFACE

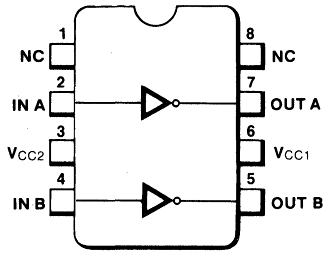
159
9645



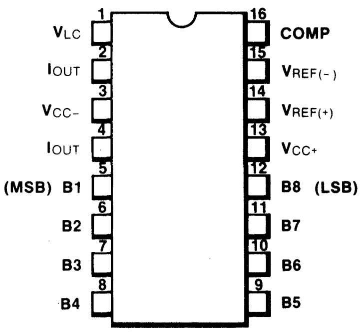
160
9646



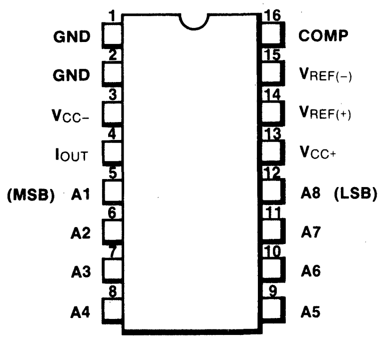
161
9646



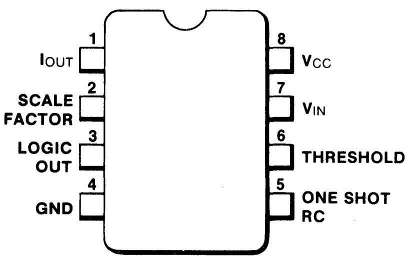
162
μA0801/DAC-08



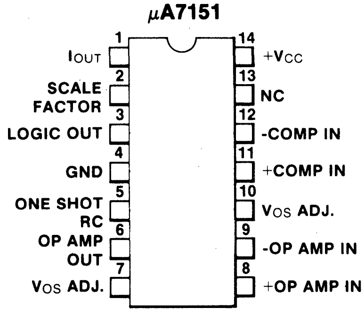
163
μA0802/1408



164
μA4151

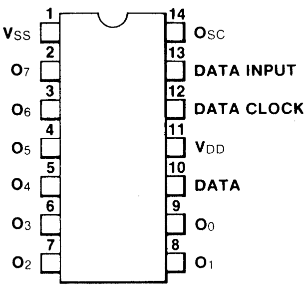


165
μA7151

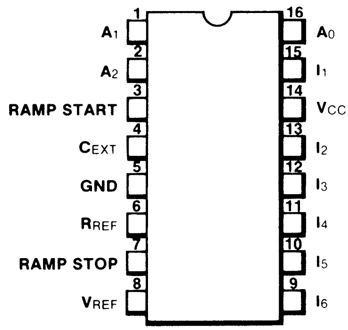


INTERFACE

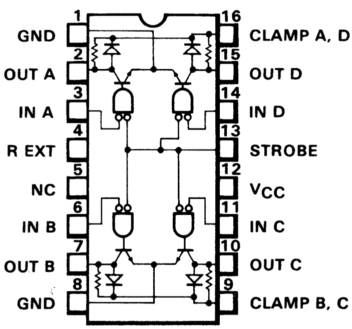
I66
9706



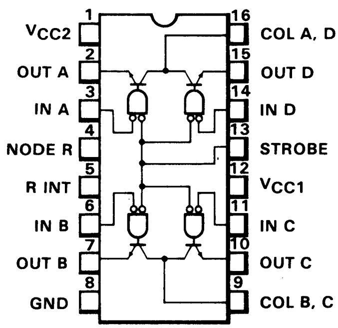
I67
9708



I68
55/75326



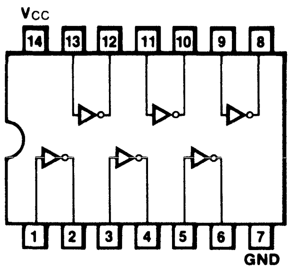
I69
55/75327



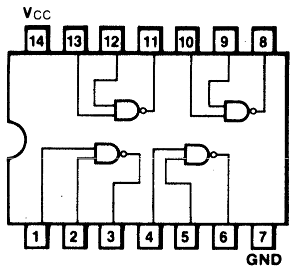
13

DIGITAL - TTL

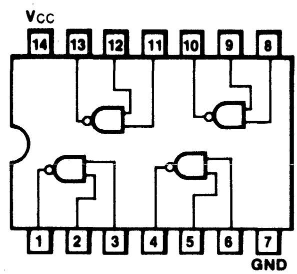
D1
9016, 9S04, 54/7404, 54H/74H04, 54S/74S04, 54LS/74LS04, 9017, 9S05A, 54/7405, 54H/74H05, 54S/74S05, 54LS/74LS05, 54/7406, 54/7414, 54LS/74LS14, 54/7416



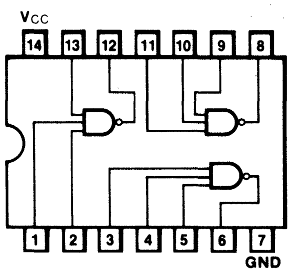
D2
9002, 54/7400, 54H/74H00, 54S/74S00, 54LS/74LS00, 9012, 54H/74H01, 54/7403, 54S/74S03, 54LS/74LS03, 7426, 54LS/74LS26 54/7437, 54LS/74LS37, 54/7438, 74LS38, 54/74132, 54S/74S132, 74LS132



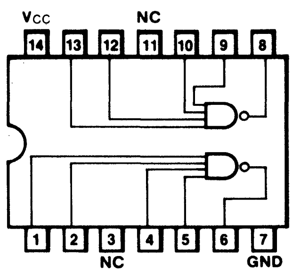
D3
54/7401, 96101, 54/7439



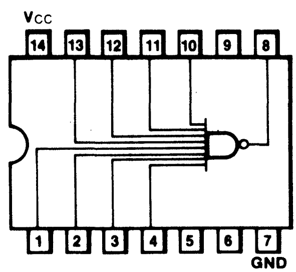
D4
9003, 54/7410, 54H/74H10, 54S/74S10, 54LS/74LS10, 54/7412



D5
9004, 54/7420, 54H/74H20, 54S/74S20, 54LS/74LS20, 54/7422, 54H/74H22, 74S22, 54LS/74LS22, 9009, 54/7440, 54H/74H40, 54S/74S40, 54LS/74LS40, 54S/74S140

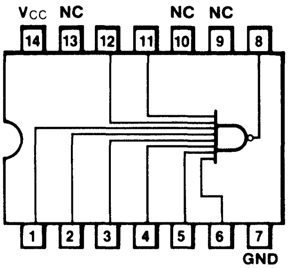


D6
9007

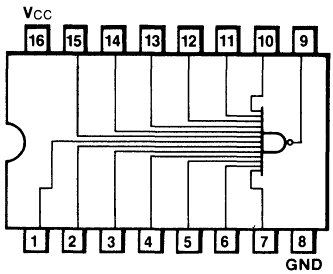


DIGITAL - TTL

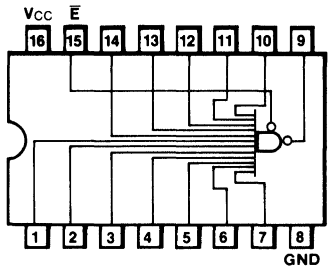
D7
54/7430, 54H/74H30
54S/74S30, 54LS/74LS30



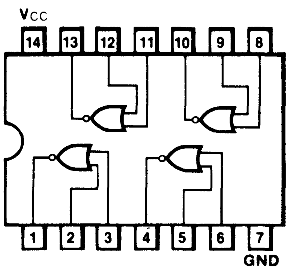
D8
54S/74S133,
54LS/74LS133



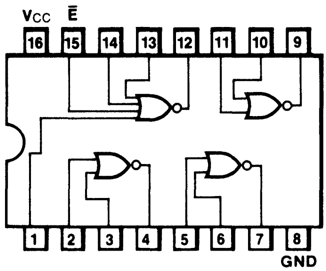
D9
54S/74S134



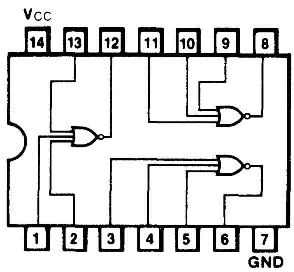
D10
54/7402, 54S/74S02,
54LS/74LS02, 54LS/74LS28
74LS33



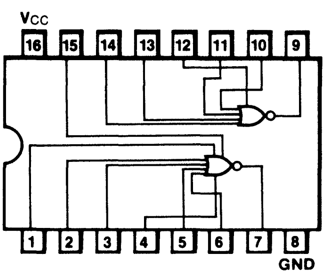
D11
9015



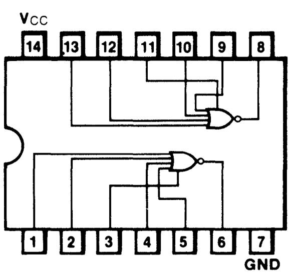
D12
54/7427, 54LS/74LS27



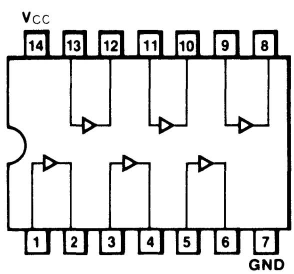
D13
54/7425



D14
54/7423



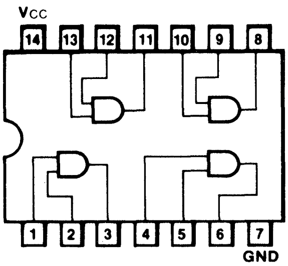
D15
54/7407, 54/7417



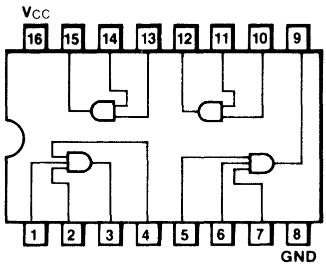
13

DIGITAL - TTL

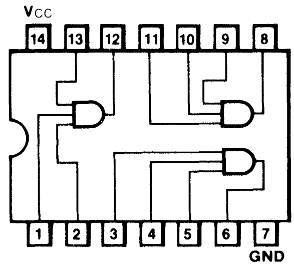
D16
547408, 54H/74H08, 54S/74S08, 54LS/74LS08 54/7409, 54S/74S09, 54LS/74LS09



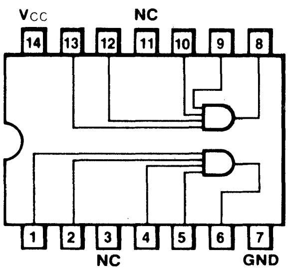
D17
9S41



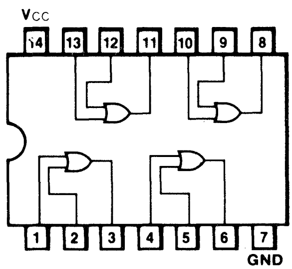
D18
54/7411, 54H/74H11, 54S/74S11, 54LS/74LS11, 54S/74S15, 54LS/74LS15



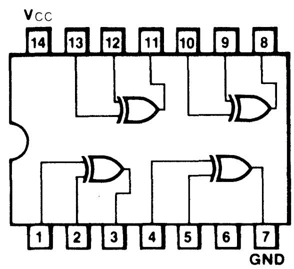
D19
54/7421, 54H/74H21 54LS/74LS21



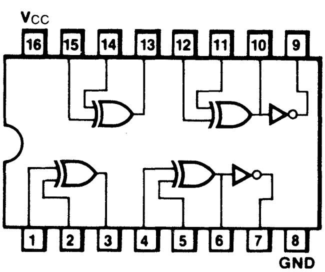
D20
54/7432, 54S/74S32 54LS/74LS32



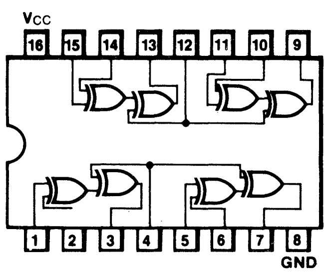
D21
54/7486, 54S/74S86, 54LS/74LS86, 54LS/74LS136



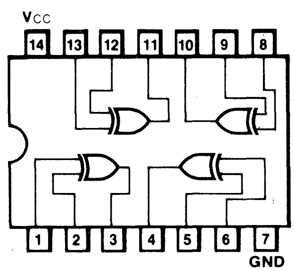
D22
9014



D23
54S/74S135

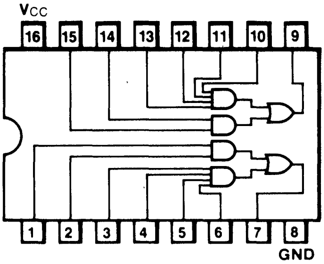


D24
9386, 74LS266

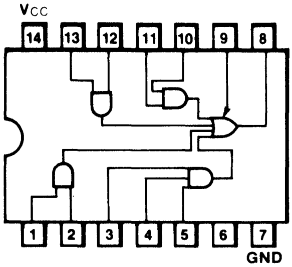


DIGITAL - TTL

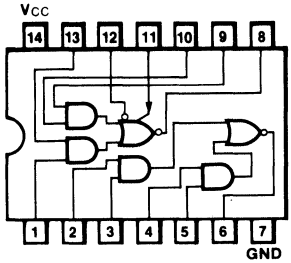
D25
9S42



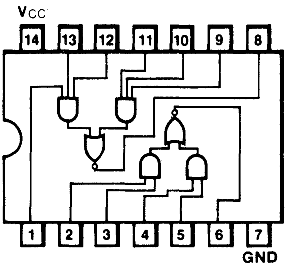
D26
54H/74H52



D27
9005, 54/7450, 54H/74H50

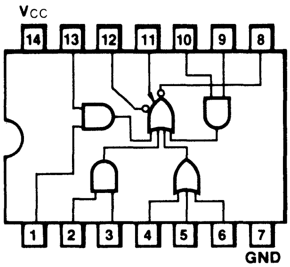


D28
54/7451*, 54H/74H51*,
54S/74S51*, 54LS/74LS51



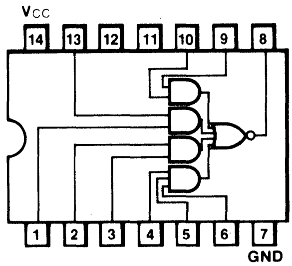
*Make no external connection to pins 11 & 12

D29
9008, 54/7453, 54H/74H53

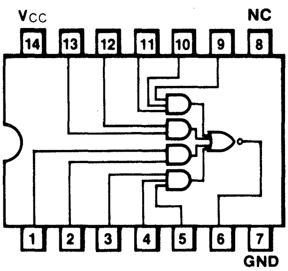


9008, 54/7453, 54H/74H53

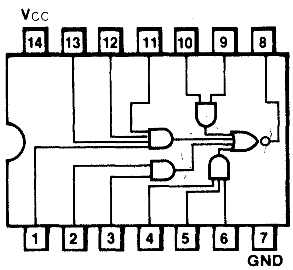
D30
54/7454, 54H/74H54



D31
54LS/75LS54

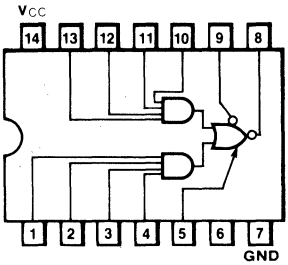


D32
74S64, 74S65

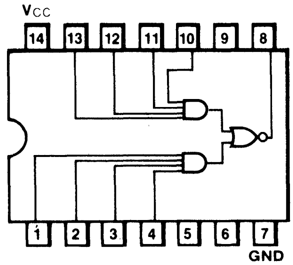


DIGITAL - TTL

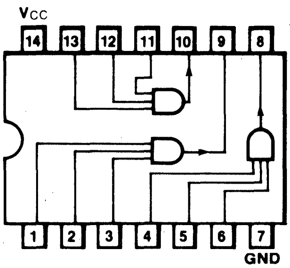
D33
54H/74H55



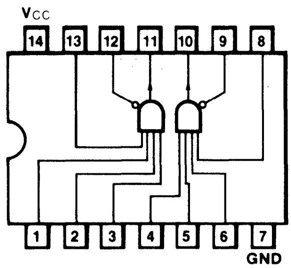
D34
54LS/74LS55



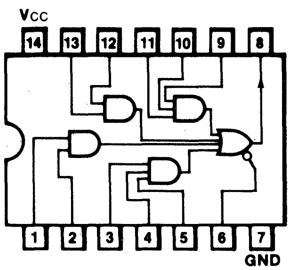
D35
54H/74H61



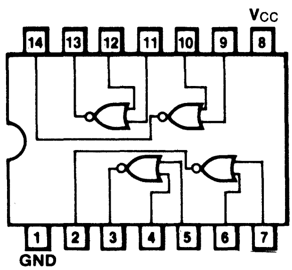
D36
9006, 54/7460,
54H/74H60



D37
54H/74H62

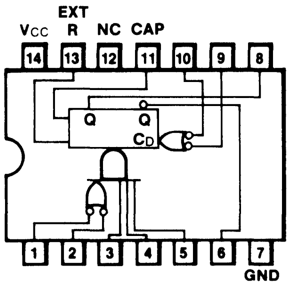


D39
96106

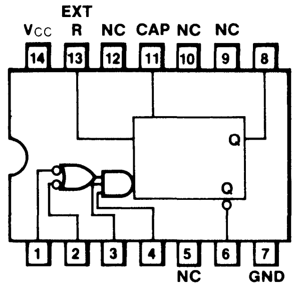


DIGITAL - TTL

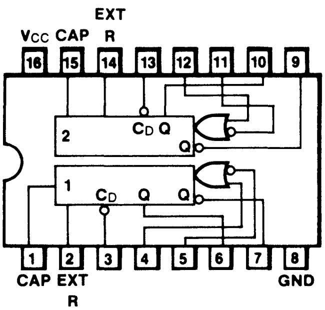
D40
9600



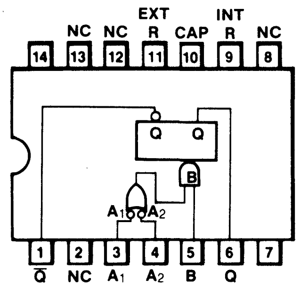
D41
9601



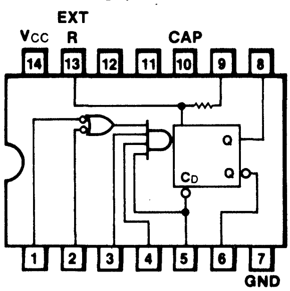
D42
9602, 96L02, 96S02, 96LS02



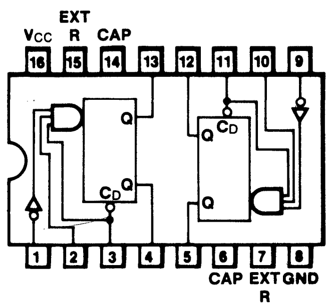
D43
9603/74121



D44
54/74122



D45
54/74123



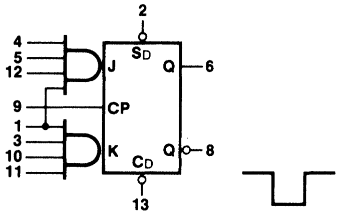
13

DIGITAL - TTL

OUTPUT CHANGES ON POSITIVE GOING EDGE

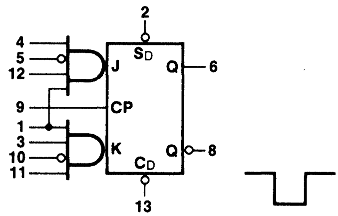
MASTER/SLAVE

D50
9000



V_{CC} = Pin 14
GND = Pin 7

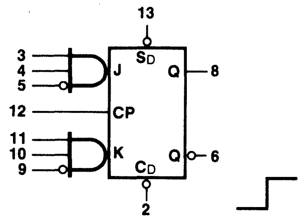
D51
9001



V_{CC} = Pin 14
GND = Pin 7

EDGE-TRIGGERED

D54
54/7470

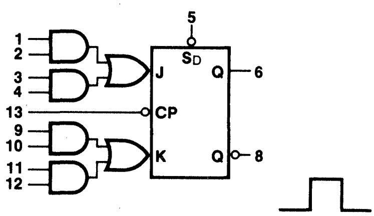


V_{CC} = Pin 14
GND = Pin 7

OUTPUT CHANGES ON NEGATIVE GOING EDGE

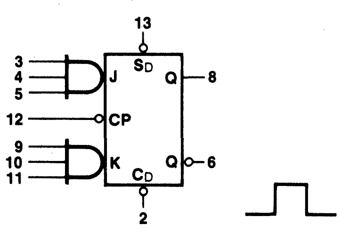
MASTER/SLAVE

D52a
54H/74H71



V_{CC} = Pin 14
GND = Pin 7

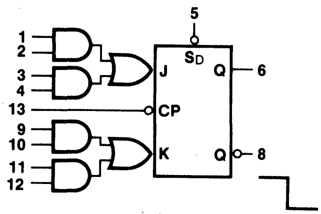
D53a
54/7472
54H/74H72



V_{CC} = Pin 14
GND = Pin 7

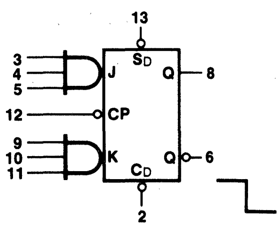
EDGE-TRIGGERED

D52b
54H/74H101



V_{CC} = Pin 14
GND = Pin 7

D53b
54H/74H102



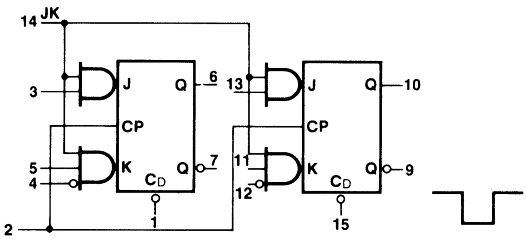
V_{CC} = Pin 14
GND = Pin 7

DIGITAL - TTL

OUTPUT CHANGES ON POSITIVE GOING EDGE

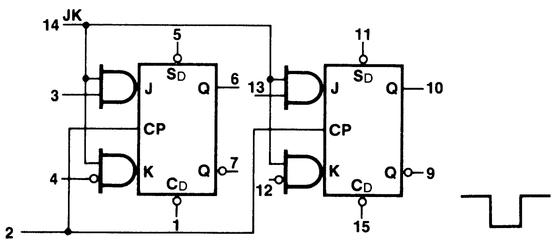
MASTER/SLAVE

D55
9020



V_{CC} = Pin 16
GND = Pin 8

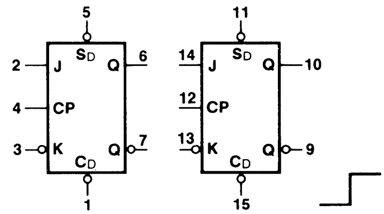
D56
9022



V_{CC} = Pin 16
GND = Pin 8

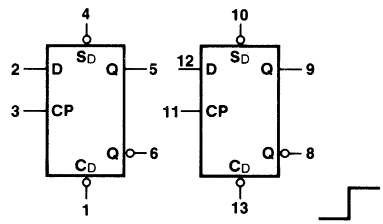
EDGE-TRIGGERED

D60
9024, 54/74109, 54S/74S109, 54LS/74LS109



V_{CC} = Pin 16
GND = Pin 8

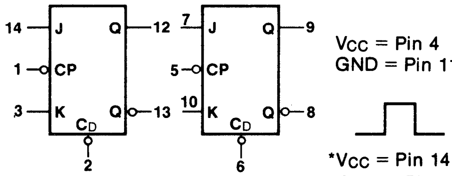
D61
54/7474, 54H/74H74, 54S/74S74, 54LS/74LS74



V_{CC} = Pin 14
GND = Pin 7

OUTPUT CHANGES ON NEGATIVE GOING EDGE

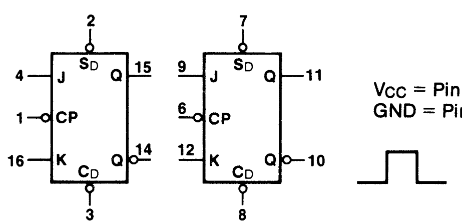
D57a
54/7473, 54H/74H73, 54LS/74LS73
*54/74107, *54LS/74LS107



V_{CC} = Pin 4
GND = Pin 11

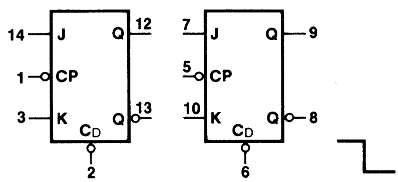
*V_{CC} = Pin 14
GND = Pin 7
Pins are rotated

D58
54/7476, 54H/74H76, 54LS/74LS76



V_{CC} = Pin 5
GND = Pin 13

D57b
54H/74H103



V_{CC} = Pin 4
GND = Pin 11

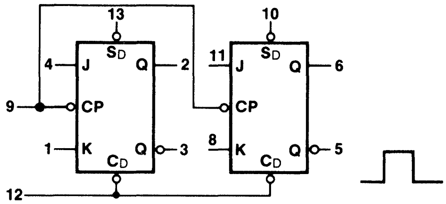
13

OUTPUT CHANGES ON NEGATIVE GOING EDGE

DIGITAL - TTL

MASTER/SLAVE

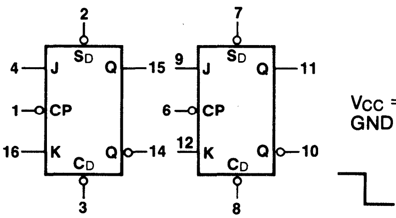
D59a
54H/74H78



V_{CC} = Pin 14
GND = Pin 7

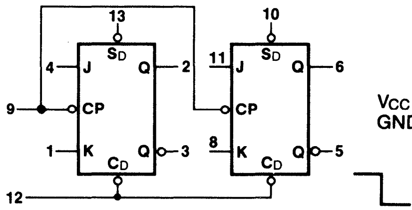
EDGE-TRIGGERED

D58
54H/74H106



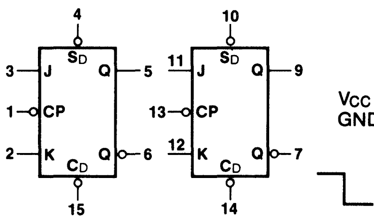
V_{CC} = Pin 5
GND = Pin 13

D59b
54H/74H108



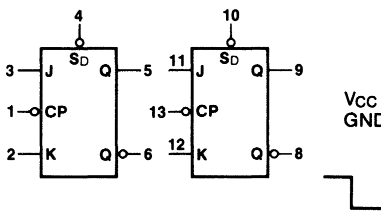
V_{CC} = Pin 14
GND = Pin 7

D62
54S/74S112, 54LS/74LS112



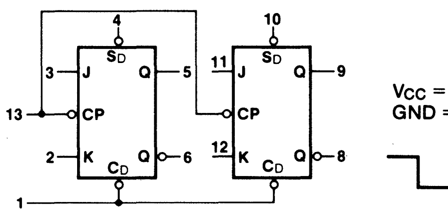
V_{CC} = Pin 16
GND = Pin 8

D63
54S/74S113, 54LS/74LS113



V_{CC} = Pin 14
GND = Pin 7

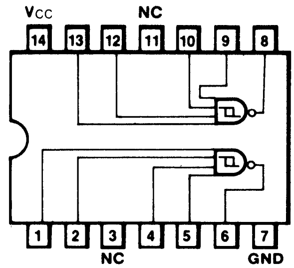
D64
54S/74S114, 54LS/74LS114



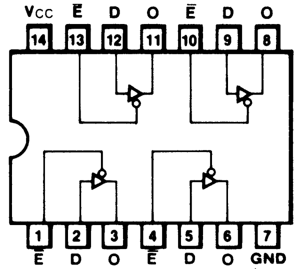
V_{CC} = Pin 14
GND = Pin 7

DIGITAL - TTL

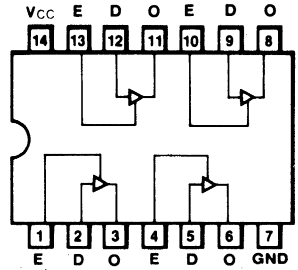
D65
54/7413, 54LS/74LS13



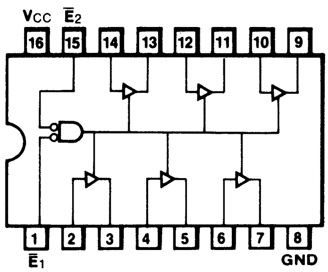
D66
54/74125, 54LS/74LS125



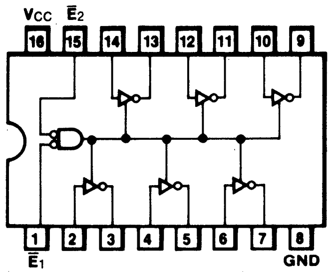
D67
54/74126, 54LS/74LS126



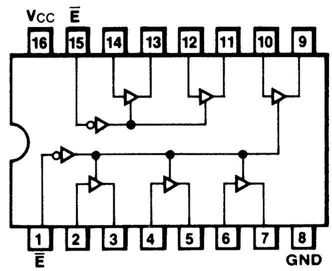
D68
54LS/74LS365



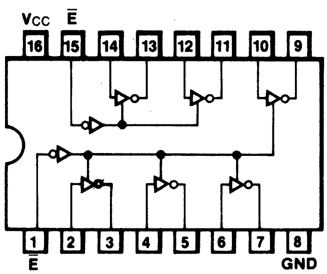
D69
54LS/74LS366



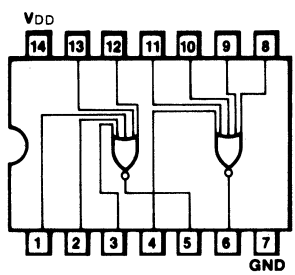
D70
54LS/74LS367



D71
54LS/74LS368



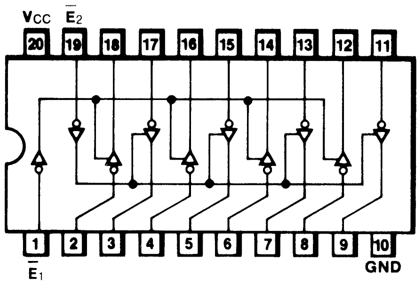
D72
54LS/74LS260



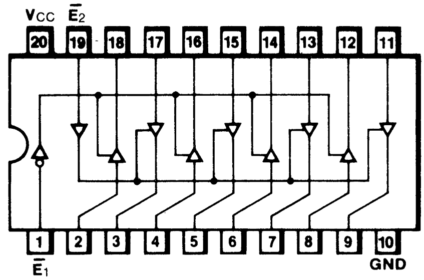
13

DIGITAL - TTL

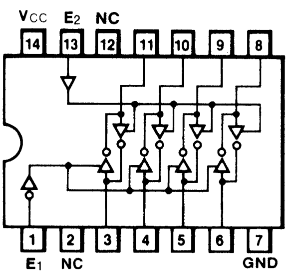
D73
54LS/74LS240



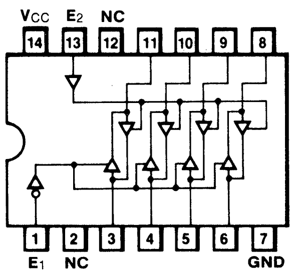
D74
54LS/74LS241



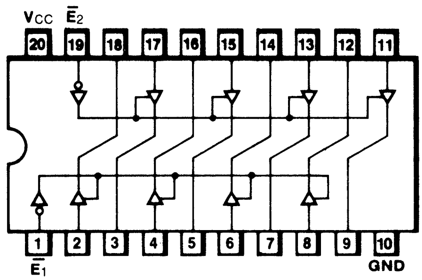
D75
54LS/74LS242



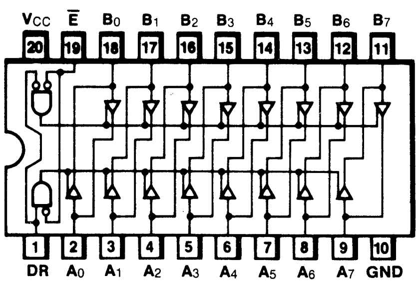
D76
54LS/74LS243



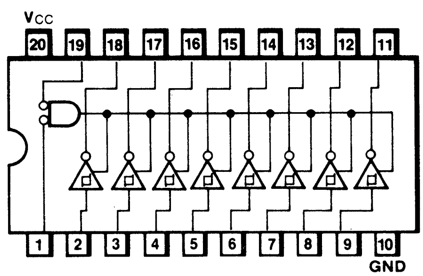
D77
54LS/74LS244



D79
54LS/74LS245

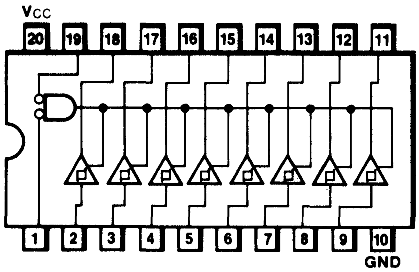


D80
54LS/74LS540

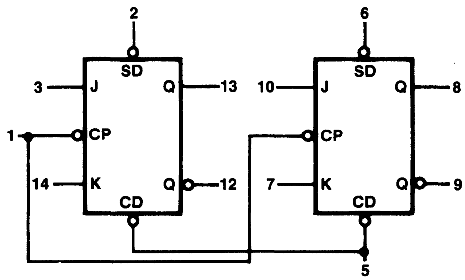


DIGITAL - TTL

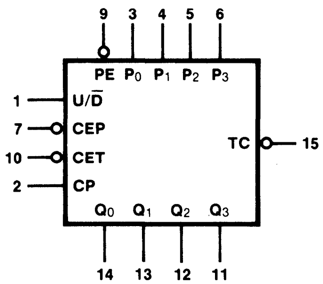
D81
54LS/74LS541



D82
54LS/74LS78

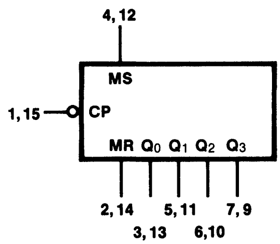


D83
54LS/74LS168, 54LS/74LS169



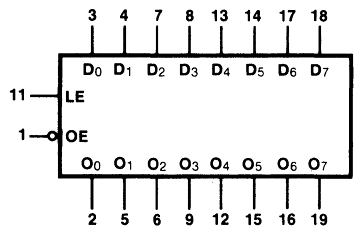
VCC = Pin 16
GND = Pin 8

D84
54LS/74LS490 (each half)



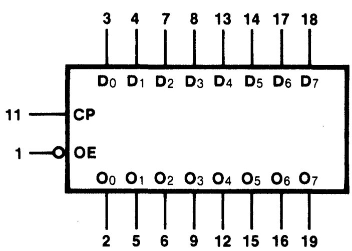
VCC = Pin 16
GND = Pin 8

D85
54LS/74LS373



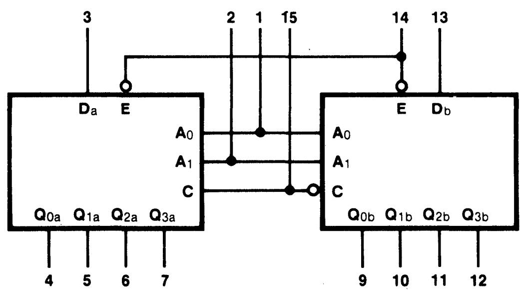
VCC = Pin 20
GND = Pin 10

D86
54LS/74LS374



VCC = Pin 20
GND = Pin 10

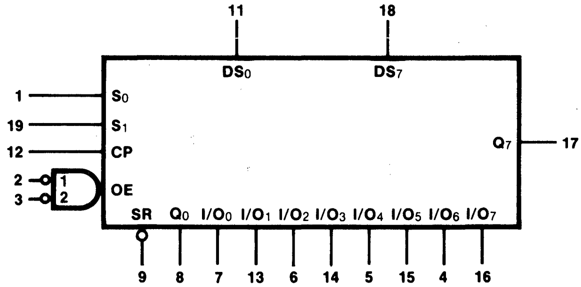
D87
54LS/74LS256



VCC = Pin 16
GND = Pin 8

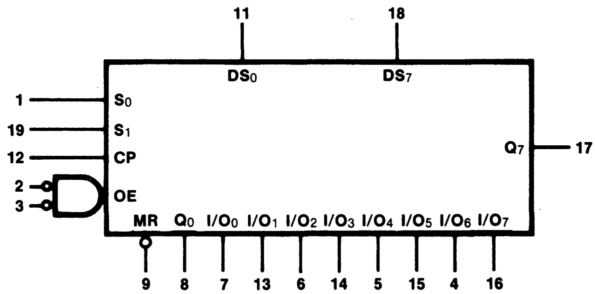
DIGITAL - TTL

D88
54LS/74LS299



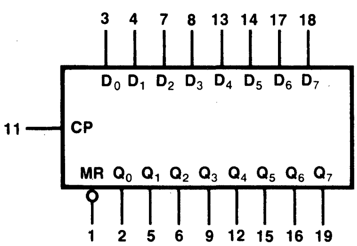
V_{CC} Pin 20
GND = Pin 10

D89
54LS/74LS323



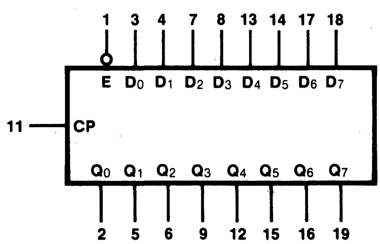
V_{CC} = Pin 20
GND = Pin 10

D90
54LS/74LS273



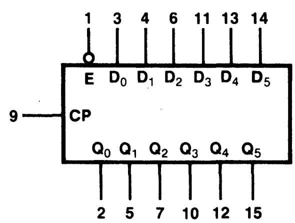
V_{CC} = Pin 20
GND = Pin 10

D91
54LS/74LS377



V_{CC} = Pin 20
GND = Pin 10

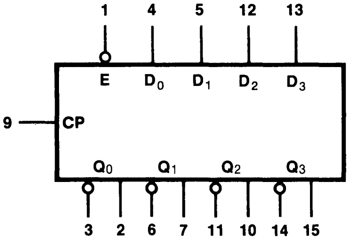
D92
54LS/74LS378



V_{CC} = Pin 16
GND = 8

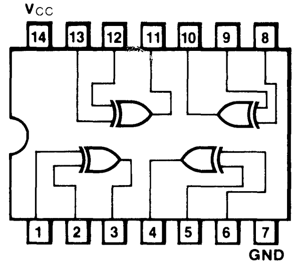
DIGITAL - TTL

D93
54LS/74LS379

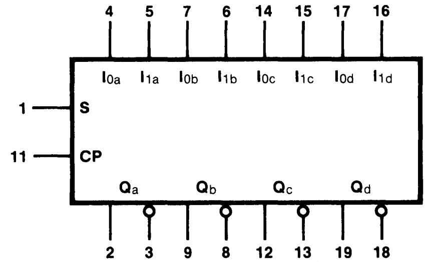


V_{CC} = Pin 16
GND = Pin 8

D94
9386, 74LS266, 54LS/74LS386

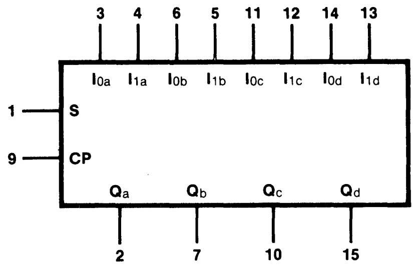


D95
54LS/74LS398



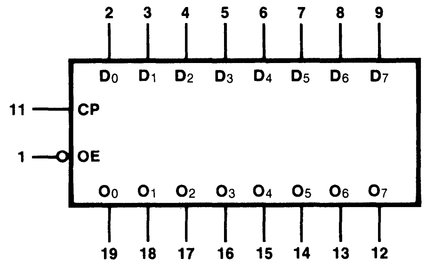
V_{CC} = Pin 20
GND = Pin 10

D96
54LS/74LS399



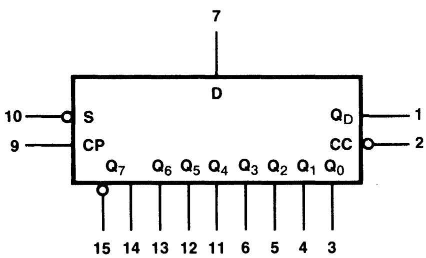
V_{CC} = Pin 16
GND = Pin 8

D97
54LS/74LS574



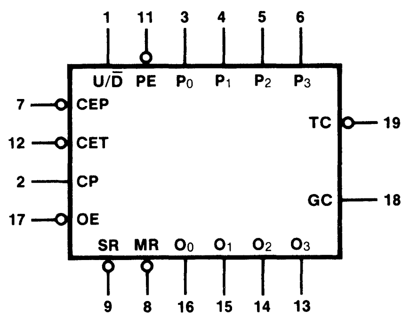
V_{CC} = Pin 20
GND = Pin 10

D98
54LS/74LS502



V_{CC} = Pin 16
GND = Pin 8

D99
54LS/74LS568,
54LS/74LS569

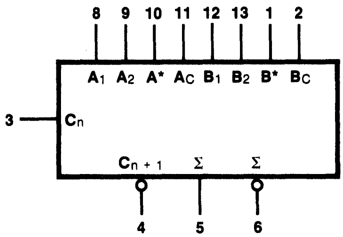


V_{CC} = Pin 20
GND = Pin 10

13

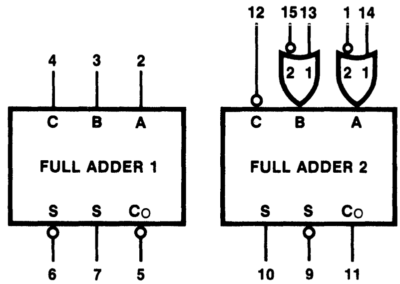
DIGITAL - TTL

D100
54/7480



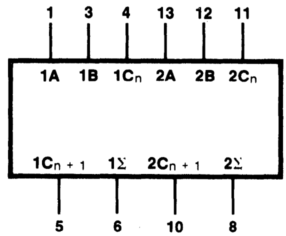
VCC = Pin 14
GND = Pin 7

D101
9304



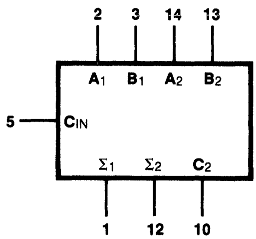
VCC = Pin 16
GND = 8

D102
93H/74H183



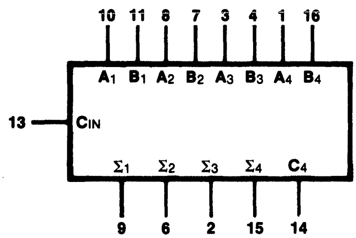
VCC = Pin 14
GND = Pin 7

D103
54/7482



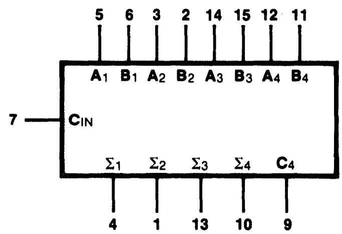
VCC = Pin 4
GND = Pin 11
NC = Pin 6, 7, 8, 9

D104
54/7483A, 54LS/74LS83



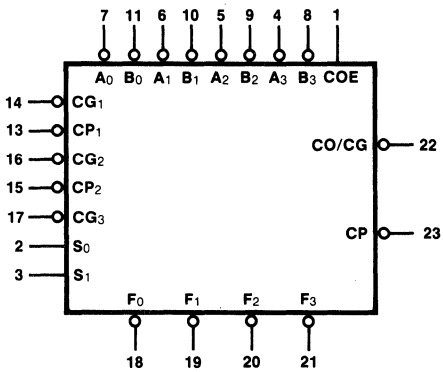
VCC = Pin 5
GND = Pin 12

D105
54/74283, 54LS/74LS283



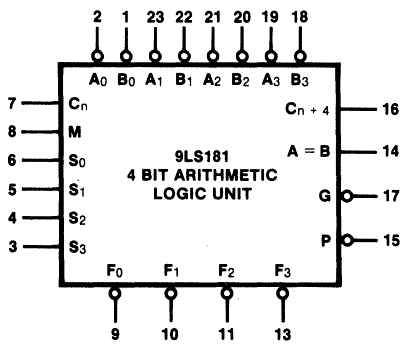
VCC = Pin 16
GND = Pin 8

D106
9340



VCC Pin 24
GND = Pin 12

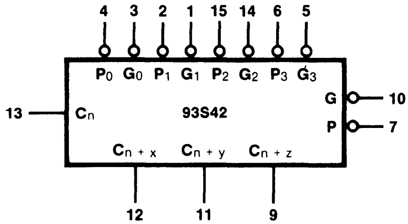
D107
93L41, 93S41/74S181,
54/74181, 54LS/74LS181



VCC Pin 24
GND = Pin 12

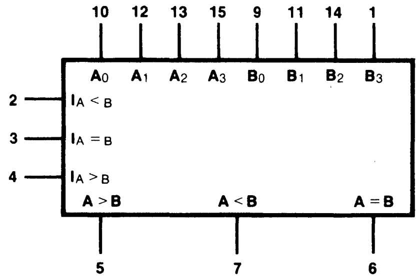
DIGITAL - TTL

D108
54/74182, 54S/74S182, 54LS/74LS182



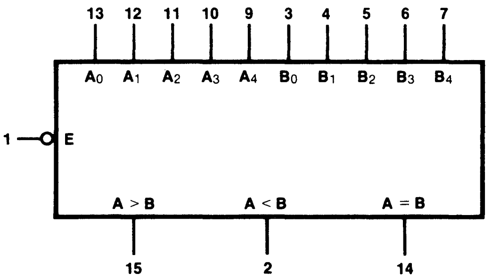
VCC = Pin 16
GND = Pin 8

D109
54/7485, 54LS/74LS85



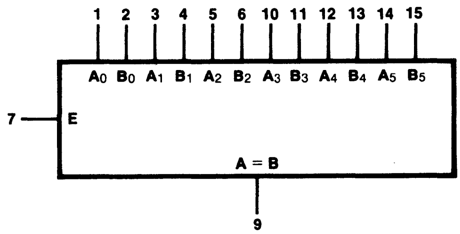
VCC = Pin 16
GND = Pin 8

D110
9324, 93L24



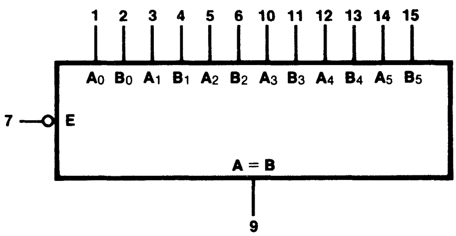
VCC = Pin 16
GND = Pin 8

D111
93S46



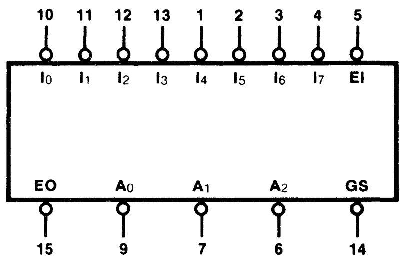
VCC = Pin 16
GND = Pin 8

D112
93S47



VCC = Pin 16
GND = Pin 8

D113
9318, 93L18

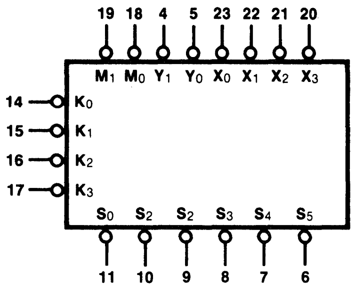


VCC = Pin 16
GND = Pin 8

13

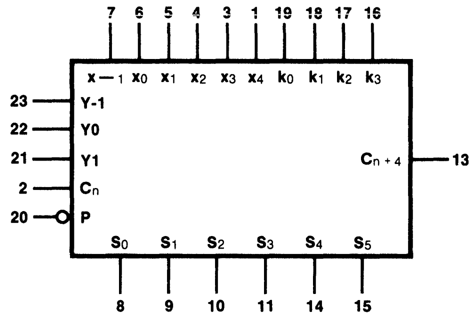
DIGITAL - TTL

D114
9344



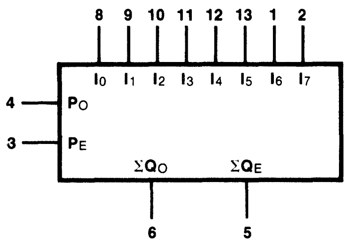
VCC = Pin 24
GND = Pin 12
NC = Pin 1, 2, 3, 13

D115
93S43



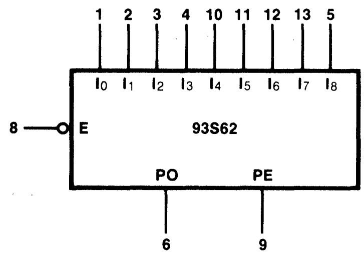
VCC = Pin 24
GND = 12

D116
54/74180



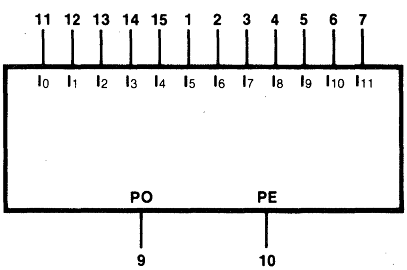
VCC = Pin 14
GND = Pin 7

D117
93S62



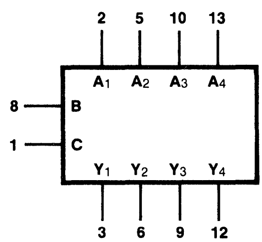
VCC = Pin 14
GND = Pin 7

D118
9348



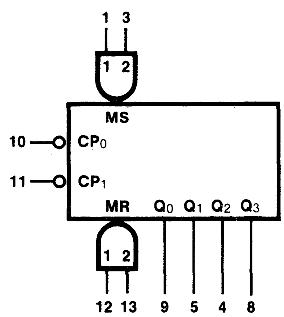
VCC = Pin 16
GND = Pin 8

D119
93H87/74H87



VCC = Pin 14
GND = Pin 7

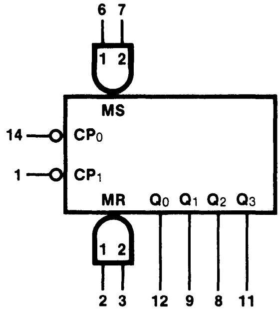
D120
54/74290, 54LS/74LS290



VCC = Pin 14
GND = Pin 7
NC = Pins 2, 6

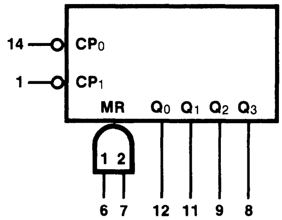
DIGITAL-TTL

D121
54/7490A, 54LS/74LS90



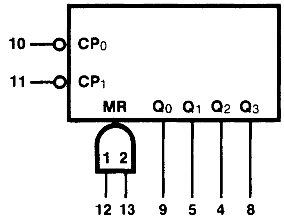
Vcc = Pin 5
GND = Pin 10
NC = Pin 4, 13

D122
54/7492, 74LS92



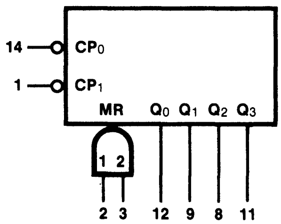
Vcc = Pin 5
GND = Pin 10
NC = 2, 3, 4, 13

D123
54/74293, 54LS/74LS293



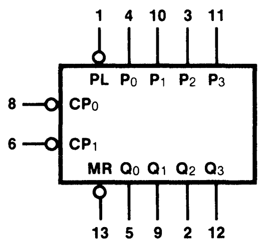
Vcc = Pin 14
GND = Pin 7
NC = Pins 1, 2, 3, 6

D124
54/7493A, 54LS/74LS93



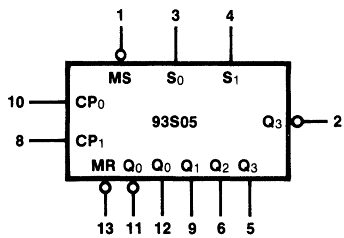
Vcc Pin 5
GND = Pin 10
NC = Pins 4, 6, 7, 13

D125
54/74176, 54/74177, 54/74196, 54LS/74LS196, 54/74197, 54LS/74LS197



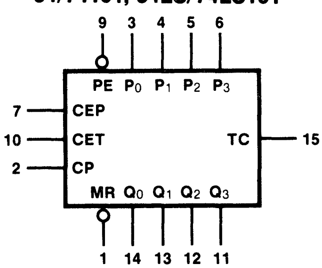
Vcc = Pin 14
GND = Pin 7

D126
9305, 93S05



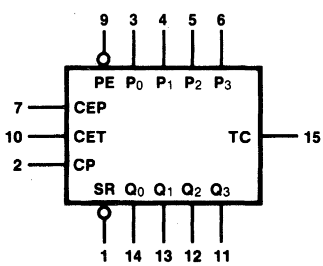
Vcc = Pin 14
GND = Pin 7

D127
9310, 93L10, 93S10, 9316, 93L16, 93S16, 54/74160, 54LS/74LS160, 54/74161, 54LS/74LS161



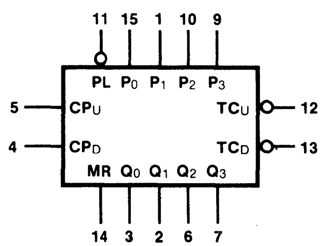
Vcc = Pin 16
GND = Pin 8

D128
54/74162, 54LS/74LS162, 54/74163, 54LS/74LS163



Vcc = Pin 16
GND = Pin 8

D129
54/74192, 54LS/74LS192, 54/74193, 54LS/74LS193

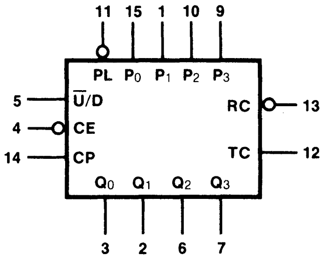


Vcc = Pin 16
GND = Pin 8

13

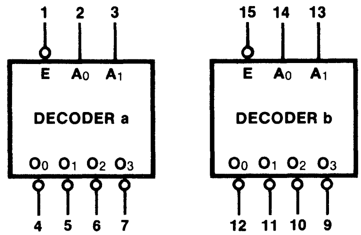
DIGITAL - TTL

D130
54/74190, 74LS190
54/74191, 74LS191



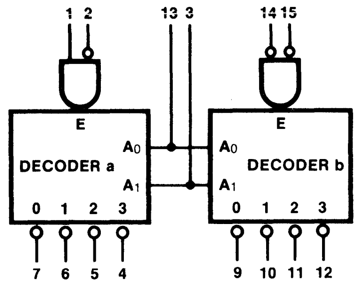
VCC = Pin 16
GND = Pin 8

D131
9321, 93L21,
54/74S139, 54LS/74LS139



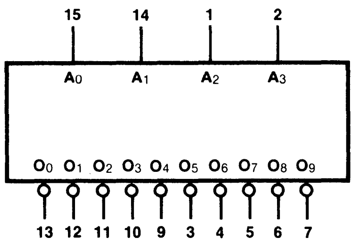
VCC = Pin 16
GND = Pin 8

D132
54/74155, 54LS/74LS155
54/74156, 54LS/74LS156



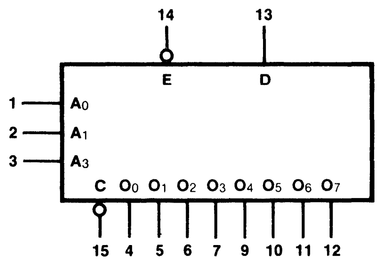
VCC = Pin 16
GND = Pin 8

D133
9301, 93L01, 9302



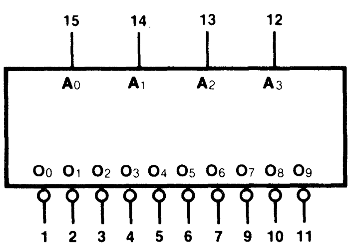
VCC Pin 16
GND = Pin 8

D134
9334, 93L34, 54LS/74LS259



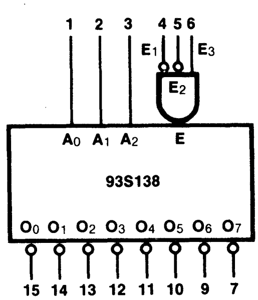
VCC = Pin 16
GND = Pin 8

D135
54/7442, 54LS/74LS42,
54/7443, 54/7444, 54/7445
54/74145, 54LS/74LS145



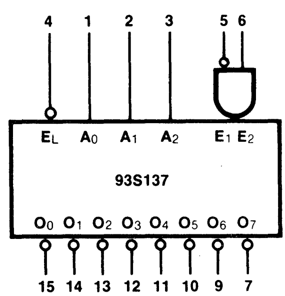
VCC = Pin 16
GND = Pin 8

D136
54S/74S138, 54LS/74LS138



VCC = Pin 16
GND = Pin 8

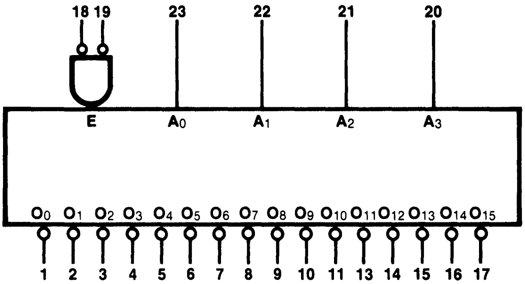
D137
93S137



VCC = Pin 16
GND = Pin 8

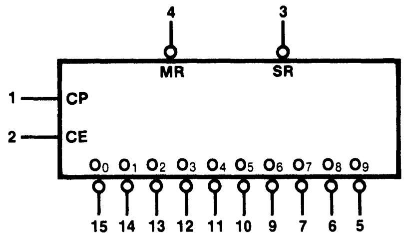
DIGITAL - TTL

D138
9311, 93L11, 54/74154



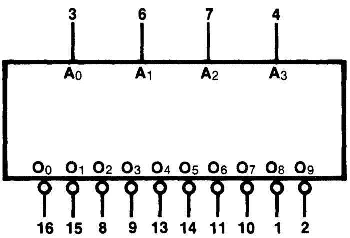
V_{CC} = Pin 24
GND = Pin 12

D139
9319, 9320



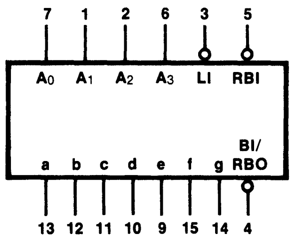
V_{CC} = Pin 16
GND = Pin 8

D140
9315
54/7441, 74141



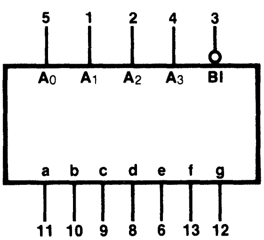
V_{CC} = Pin 5
GND = Pin 12

D141
9307, 54/7448,
54LS/74LS48, 54LS/74LS248
54LS/74LS249



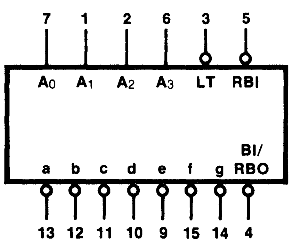
V_{CC} = Pin 16
GND = Pin 8

D142
54/7449, 54LS/74LS49



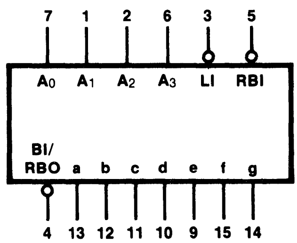
V_{CC} = Pin 14
GND = Pin 7

D143
9317B, 9317C, 54/7446,
54/7447, 54LS/74LS47,
54LS/74LS247



V_{CC} = Pin 16
GND = Pin 8

D144
9368

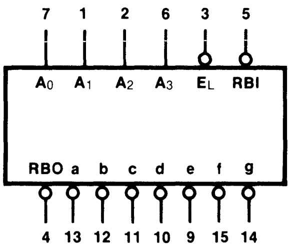


V_{CC} = Pin 16
GND = Pin 8

13

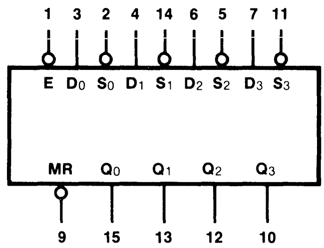
DIGITAL - TTL

D145
9370, 9374



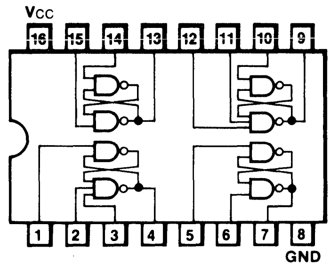
VCC = Pin 16
GND = Pin 8

D146
9314, 93L14

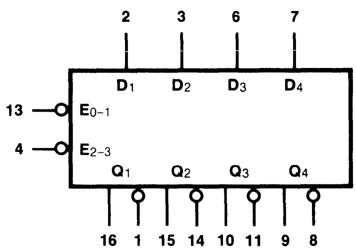


VCC = Pin 16
GND = Pin 8

D147
54/74279, 54LS/74LS279

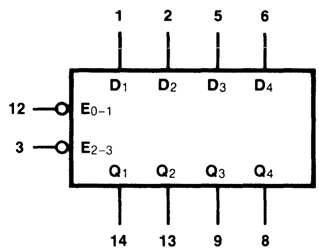


D148
54/7475, 54LS/74LS75



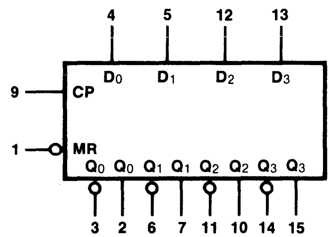
VCC = Pin 5
GND = Pin 12

D149
54/7477, 54LS/74LS77



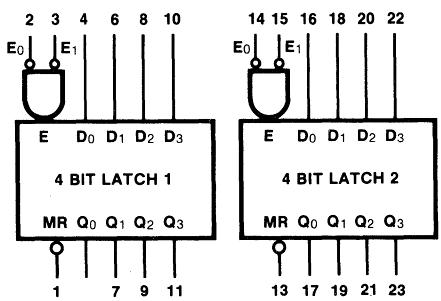
VCC = Pin 4
GND = Pin 11
NC = Pins 7, 10

D150
54/74175, 54S/74S175, 54LS/74LS175



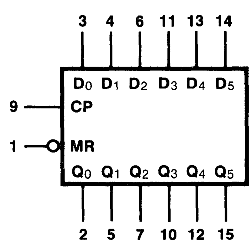
VCC = Pin 16
GND = Pin 8

D151
9308, 93L08, 54/74116



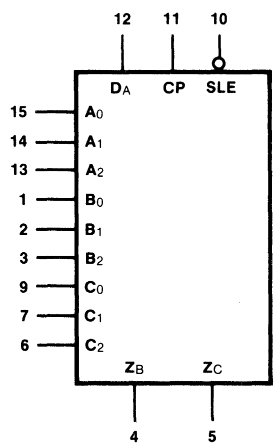
VCC = Pin 24
GND = Pin 12

D152
54/74174, 54S/74S174, 54LS/74LS174



VCC = Pin 16
GND = Pin 8

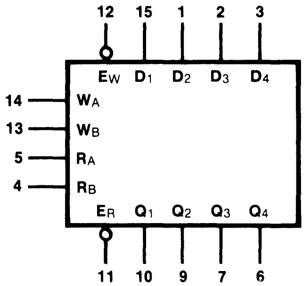
D153
9338, 93L38



VCC = Pin 16
GND = Pin 8

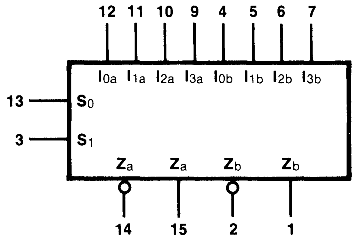
DIGITAL - TTL

D154
54/74170, 54LS/74LS170, 54LS/74LS670



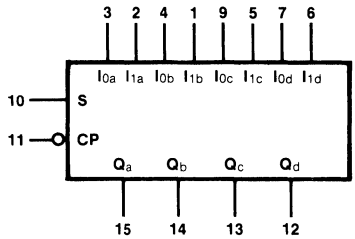
VCC = Pin 16
GND = Pin 8

D155
9309, 93L09



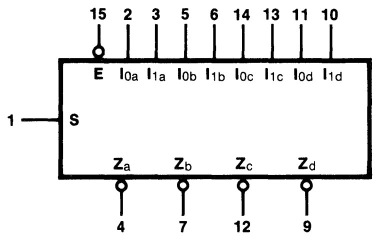
VCC = Pin 16
GND = Pin 8

D156
54/74298, 54LS/74LS298



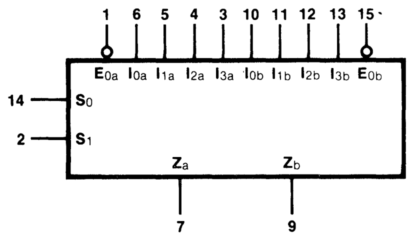
VCC = Pin 16
GND = Pin 8

D157
9322, 93L22, 54/74157, 54S/74S157, 54LS/74LS157, 54S/74S158, 54LS/74LS158, 54S/74S257, 54LS/74LS257, 54S/74S258, 54LS/74LS258



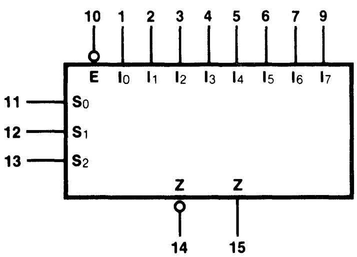
VCC = Pin 16
GND = Pin 8

D158
54/74153, 54S/74S153, 54LS/74LS153, 54S/74S253, 54LS/74LS253



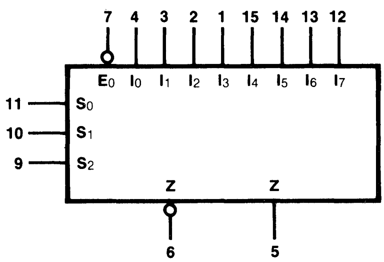
VCC = Pin 16
GND = Pin 8

D159
9312, 93L12, 93S12, 9313



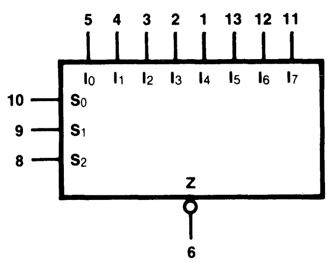
VCC = Pin 16
GND = Pin 8

D160
54/74151A, 54S/74S151, 54LS/74LS151, 54S/74S251, 54LS/74LS251



VCC = Pin 16
GND = Pin 8

D161
54/74152A, 54LS/74LS152

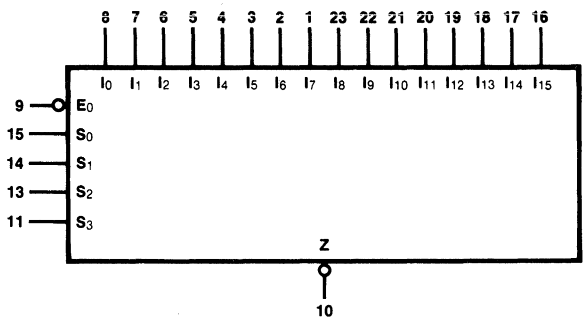


VCC = Pin 14
GND = Pin 7

13

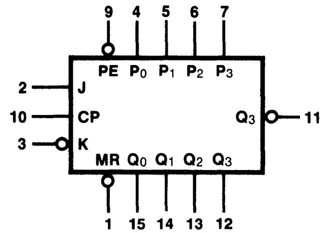
DIGITAL - TTL

D162
54/74150



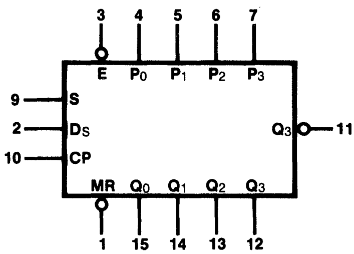
VCC = Pin 24
GND = Pin 12

D163
9300, 93H00, 93L00, 93S00, 54/74195, 54LS/74LS195



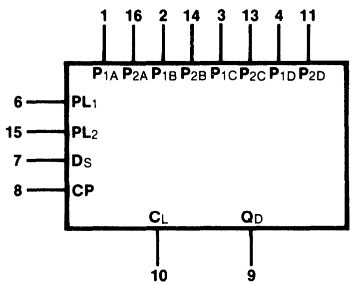
VCC = Pin 16
GND = Pin 8

D164
93H72



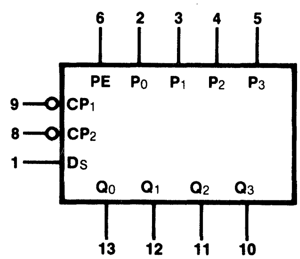
VCC = Pin 16
GND = Pin 8

D165
54/7494



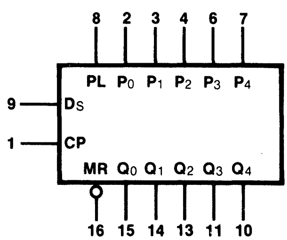
VCC = Pin 5
GND = Pin 12

D166
54/7495, 54LS/74LS95, 54LS/74LS95B



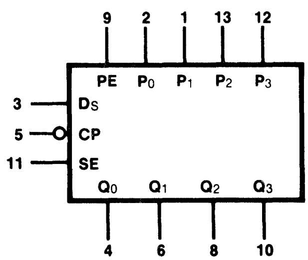
VCC = Pin 14
GND = Pin 7

D167
54/7496



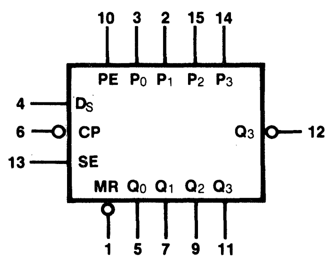
VCC = Pin 5
GND = Pin 12

D168
54/74178



VCC = Pin 14
GND = Pin 7

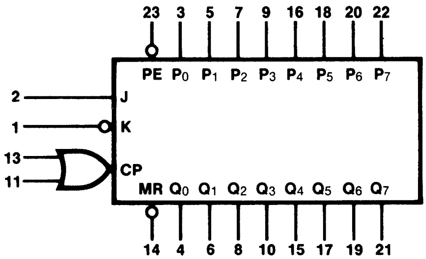
D169
54/74179



VCC = Pin 16
GND = Pin 8

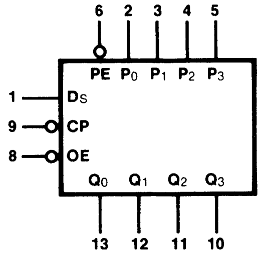
DIGITAL - TTL

D170
54/74199



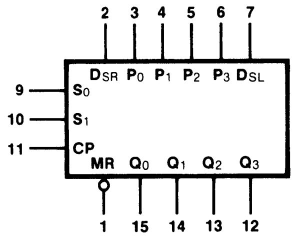
VCC = Pin 24
GND = Pin 12

D171
54LS/74LS295, 54LS/74LS295A



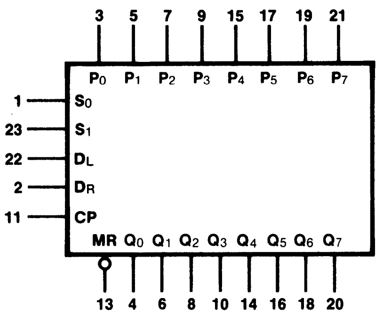
VCC = Pin 14
GND = Pin 7

D172
54/74194, 54S/74S194, 54LS/74LS194



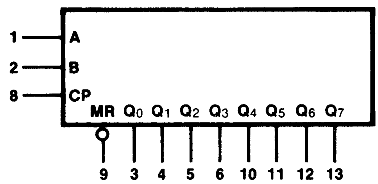
VCC = Pin 16
GND = Pin 8

D173
54/74198



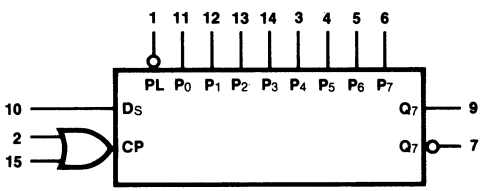
VCC = Pin 24
GND = Pin 12

D174
54/74164, 54LS/74LS164



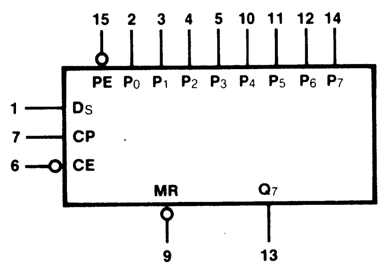
VCC = Pin 14
GND = Pin 7

D175
54/74165, 54LS/74LS165



VCC = Pin 16
GND = Pin 8

D176
54/74166

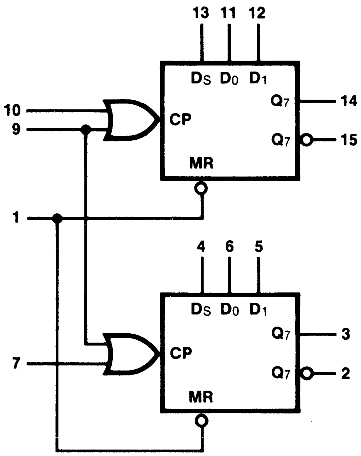


VCC = Pin 16
GND = Pin 8

13

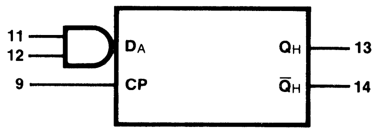
DIGITAL-TTL

D177
9328, 93L28



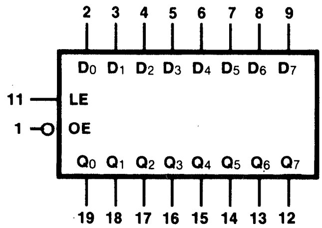
Vcc = Pin 16
GND = Pin 8

D178
54/7491



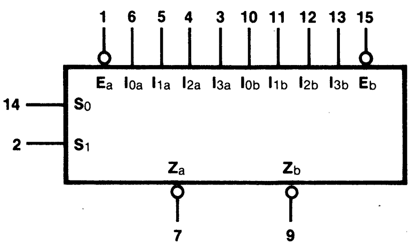
Vcc = Pin 5
GND = Pin 10

D179
54LS/74LS573



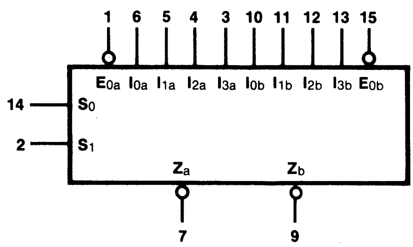
Vcc = Pin 20
GND = Pin 10

D180
54LS/74LS352



Vcc = Pin 16
GND = Pin 8

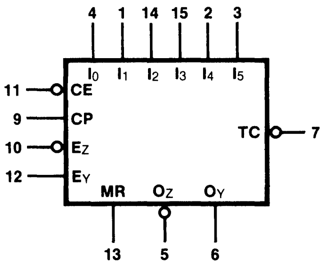
D181
54LS/74LS353



Vcc = Pin 16
GND = Pin 8

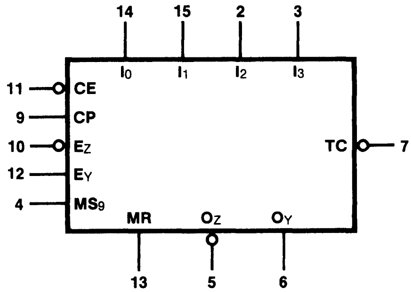
DIGITAL-TTL

D187
9397, 7497



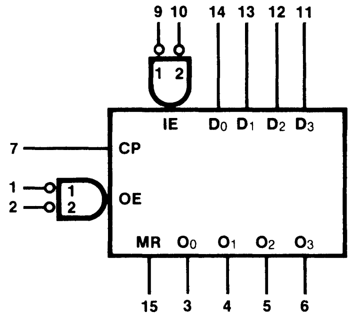
V_{CC} = Pin 16
GND = Pin 8

D188
93167, 74167



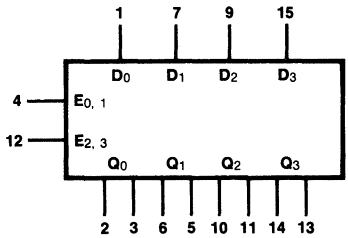
V_{CC} = Pin 16
GND = Pin 8

D189
54LS/74LS173



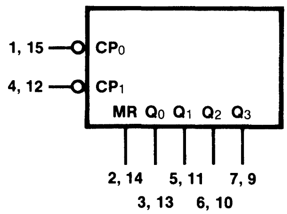
V_{CC} = Pin 16
GND = Pin 8

D190
54LS/74LS375



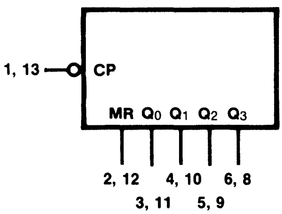
V_{CC} = Pin 16
GND = Pin 8

D194
54LS/74LS390 (each half)



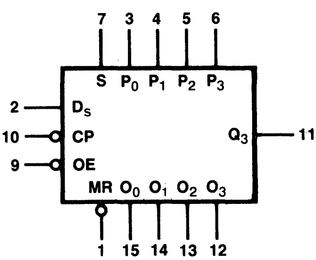
V_{CC} = Pin 16
GND = Pin 8

D195
54LS/74LS393 (each half)



V_{CC} = Pin 14
GND = Pin 7

D196
54LS/74LS395

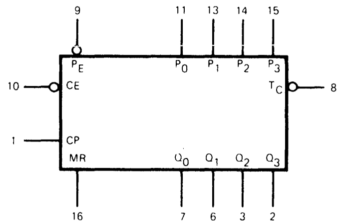


V_{CC} = Pin 16
GND = Pin 8

13

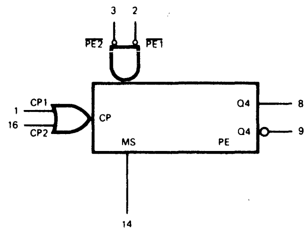
DIGITAL-ECL

E1
95H16



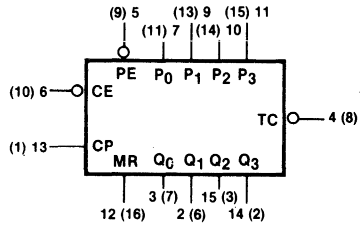
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E2
95H90/95H91



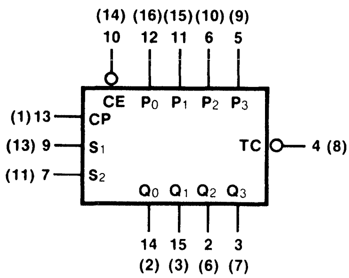
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E3
95010/95016/10010/10016



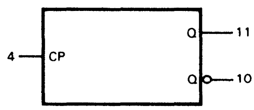
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E4
10136/10137
10536/10537



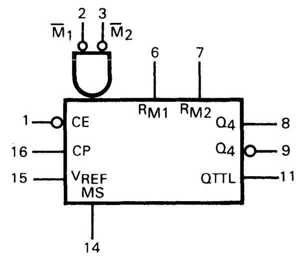
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E5
11C05



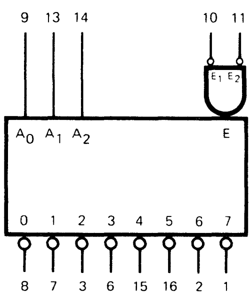
V_{CC} = Pin 14
V_{EE} = Pin 7
Bias Filter = Pin 6

E6
11C90



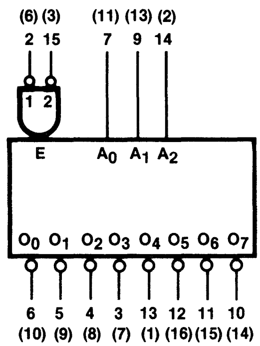
V_{CC} = Pin 4, V_{CCA} = Pin 5
V_{EE} = Pin 12, V_{EE} = Pin 13 (TTL)

E7
9538



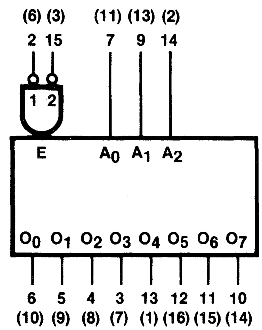
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E8
10161/10561



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

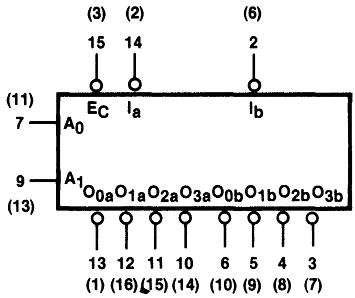
E9
10162/10562



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

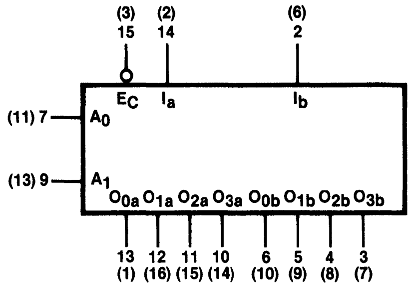
DIGITAL-ECL

E10
10171/10571



VCC1 = Pin 1 (5)
VCC2 = Pin 16 (4)
VEE = Pin 8 (12)
( ) = Flatpak

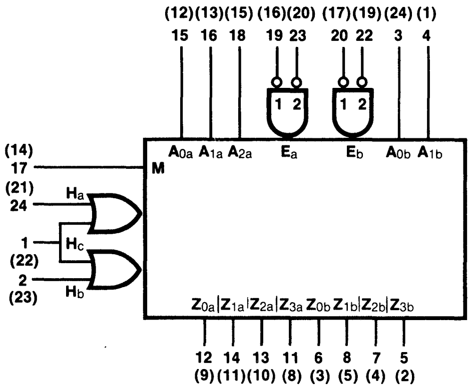
E11
10172/10572



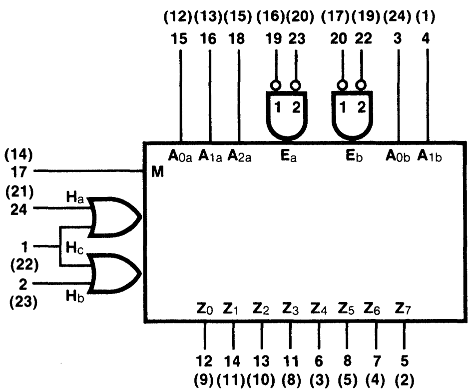
VCC1 = Pin 1 (5)
VCC2 = Pin 16 (4)
VEE = Pin 8 (12)
( ) = Flatpak

E12
100170

Single 1-of-8 Application

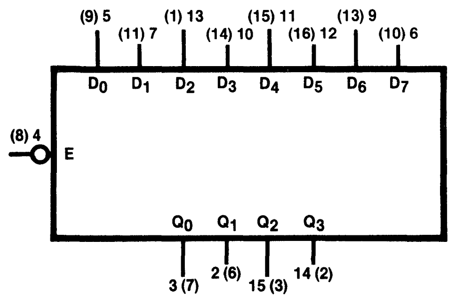


Dual 1-of-4 Application



VCC = Pin 9 (6)
VCCA = Pins 8 (5), 10 (7)
VEE = Pin 21 (18)
( ) = DIP

E13
10165/10565

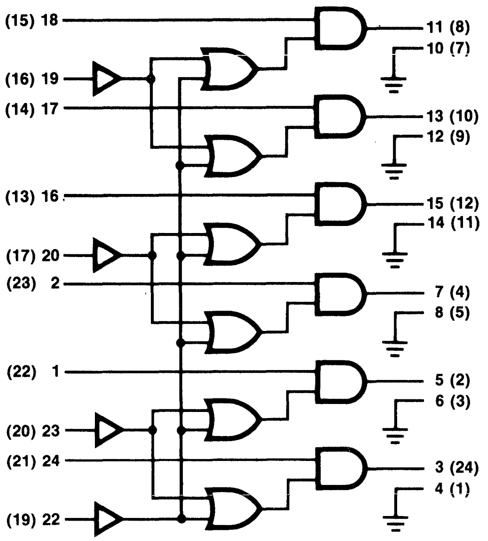


VCC1 = Pin 1 (5)
VCC2 = Pin 16 (4)
VEE = Pin 8 (12)
( ) = Flatpak

13

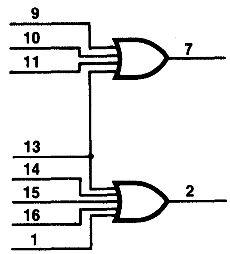
DIGITAL-ECL

E14
100123



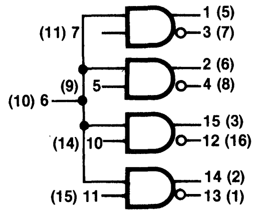
V_{CC} = Pin 9 (6)
V_{EE} = Pin 21 (18)
( ) = DIP

E15
9595



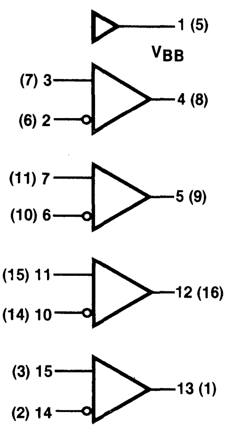
V_{CC} = Pin 5
V_{CCA} = Pin 6
V_{EE} = Pin 12
GND = Pin 4

E16
95124/10124/10524



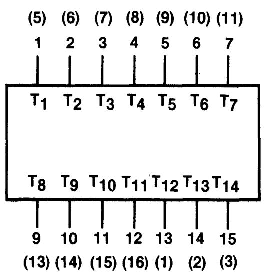
V_{CC} = Pin 9 (13)
V_{EE} = Pin 8 (12)
GND = Pin 16 (4)
( ) = Flatpak

E17
10125/10525



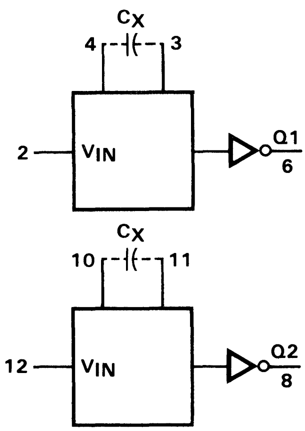
V_{CC} = Pin 9 (13)
V_{EE} = Pin 8 (12)
GND = Pin 16 (4)
( ) = Flatpal

E18
10014



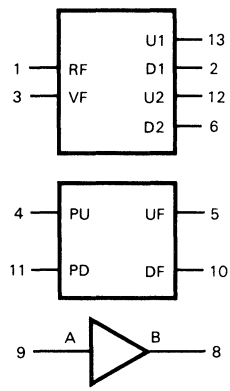
V_{CC} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E19
11C24



V_{CC} (VCM) = Pins 1, 13
V_{CC} = (Buffer) = Pin 14
GND (VCM) = Pins 5, 9
GND (BUFFER) = Pin 7

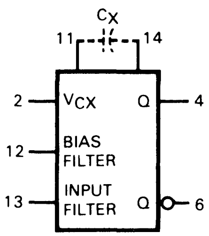
E20
11C44



V_{CC} = Pin 14
GND = Pin 7

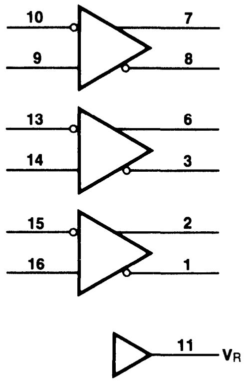
DIGITAL-ECL

E21
11C58



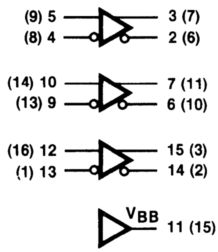
V_{CC1} = Pin 1
V_{CC2} = Pin 5
V_{EE} = Pin 8

E22
9582



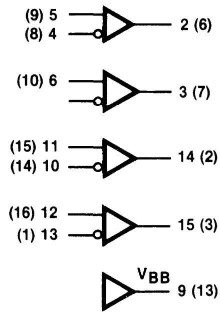
V_{CC1} = Pin 4
V_{CC2} = Pin 5
V_{EE} = Pin 12

E23
95115/10115/10515



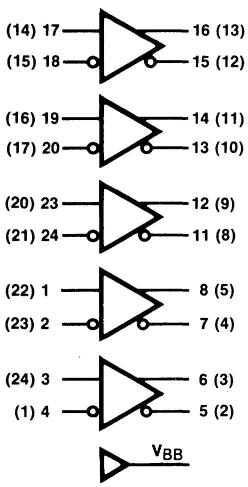
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E24
95116/10114/10116
10514/10516



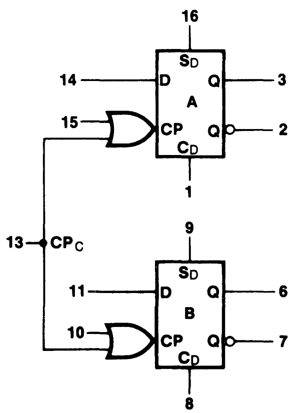
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E25
100114



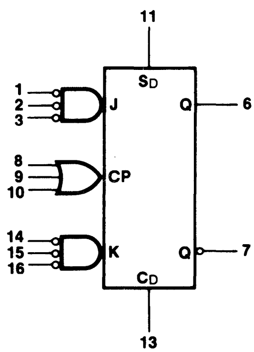
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E26
9528/95H28



V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E27
95H29

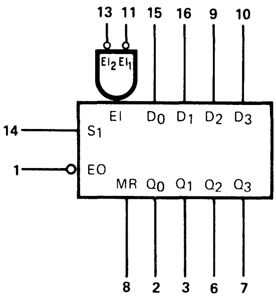


V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

13

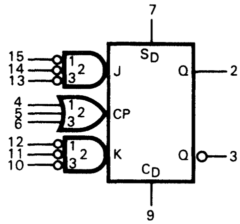
DIGITAL-ECL

E28
9534



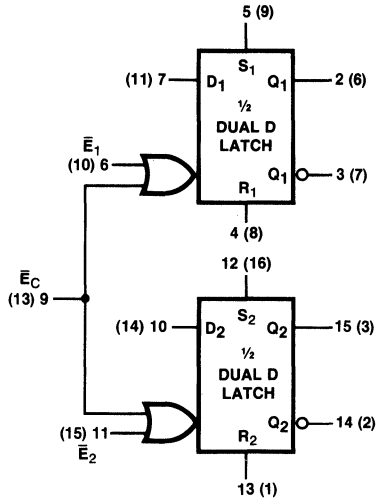
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E29
95029



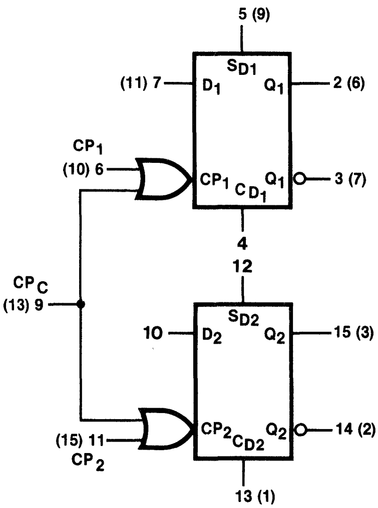
V_{CC1} = Pin 1
V_{CC2} = Pin 16
V_{EE} = Pin 8

E30
95130/10130/10530



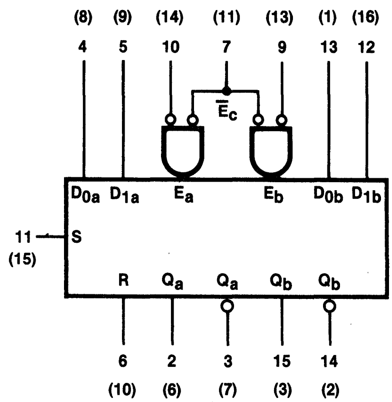
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E31
95231/10231/10131
10531/10631



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

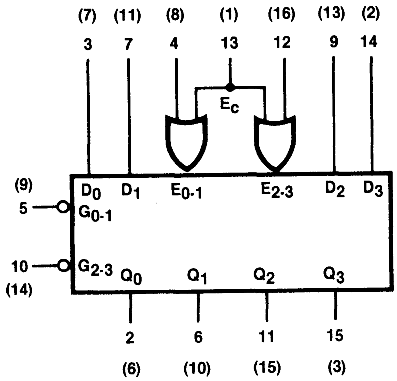
E32
10132/10532



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

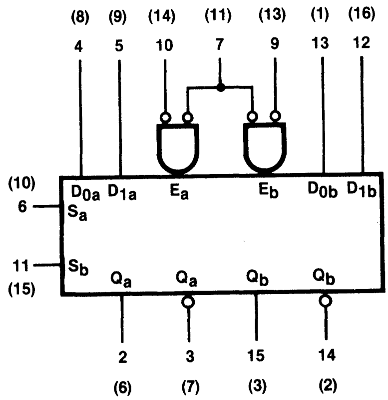
DIGITAL-ECL

E33
10133/10533



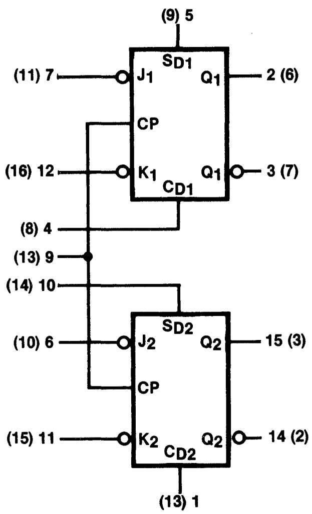
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E34
10134/10534



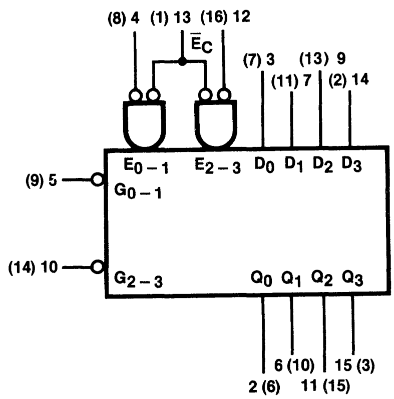
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E35
10135/10535



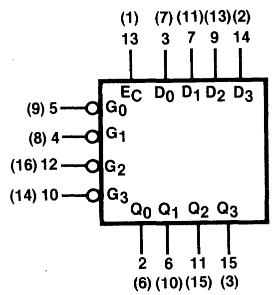
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E36
10153/10553



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E37
10168/10568

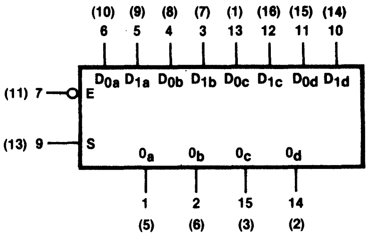


V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

13

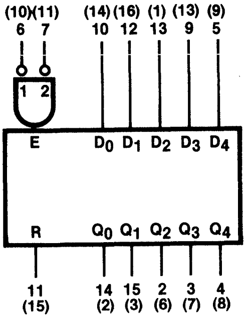
DIGITAL-ECL

E38
10173/10573



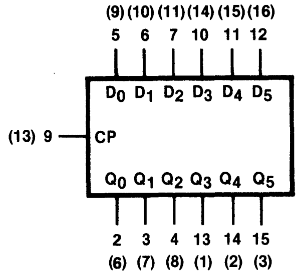
V_{CC} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E39
10175/10575



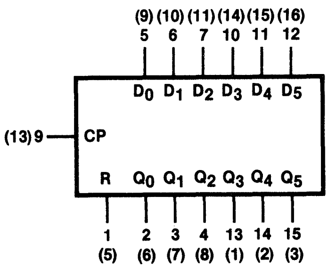
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E40
10176/10576



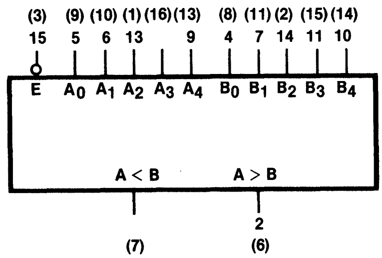
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E41
10186/10586



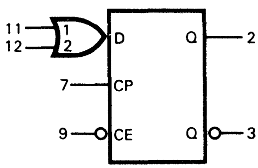
V_{CC} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E42
10166/10566



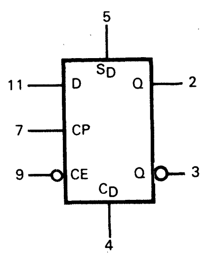
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E43
11C06



V_{CC1} = Pin 1
V_{CC2} = Pin 16
V_{EE} = Pin 8

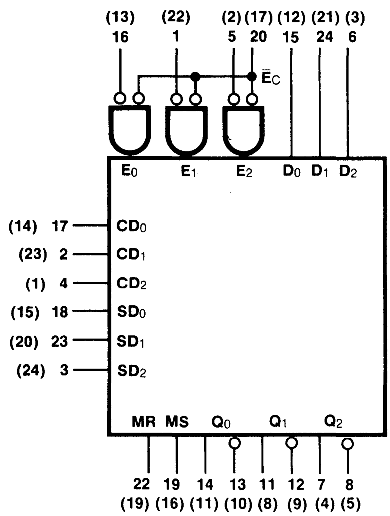
E44
11C70



V_{CC1} = Pin 1
V_{CC2} = Pin 16
V_{EE} = Pin 8

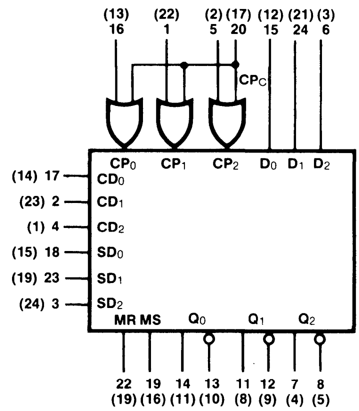
DIGITAL-ECL

E45
100130



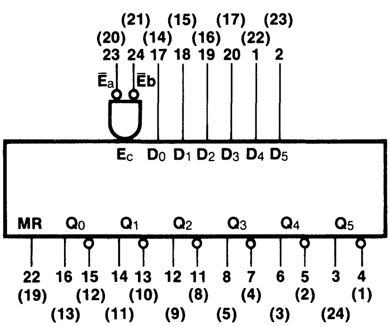
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E46
100131



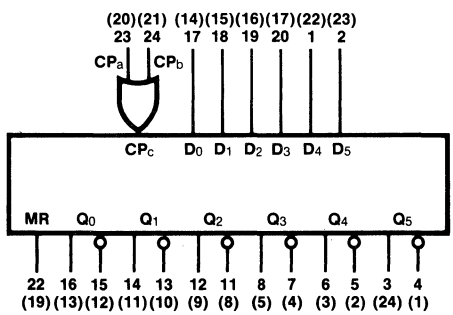
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E47
100150



V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E48
100151

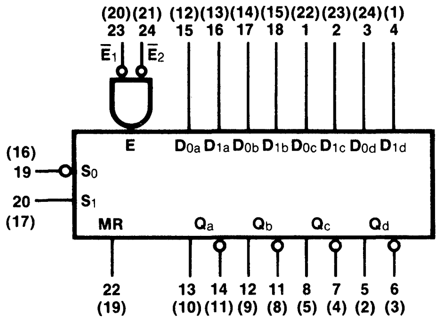


V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

13

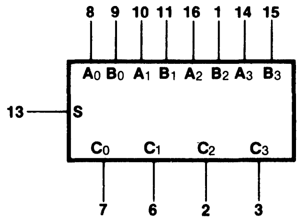
DIGITAL-ECL

E49
100155



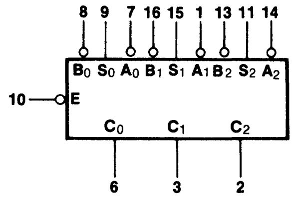
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E50
9579



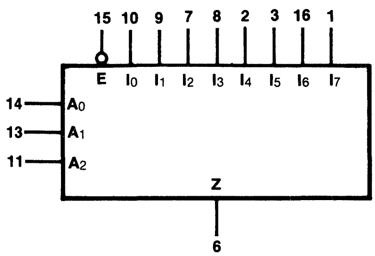
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E51
9580



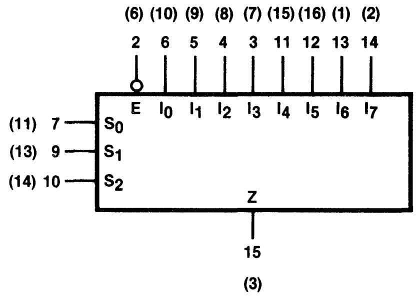
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E52
9581



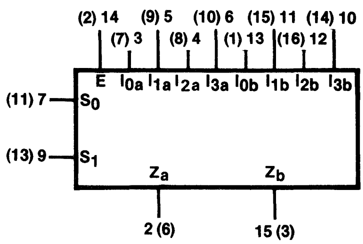
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E53
10164/10564



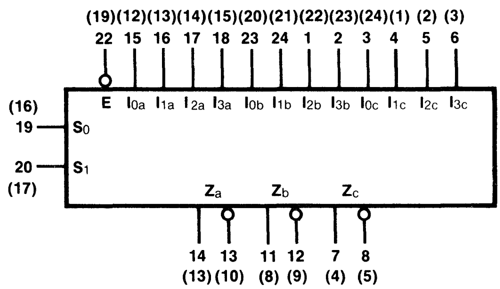
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E54
10174/10574



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

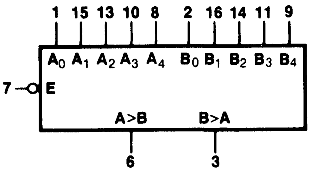
E55
100171



V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

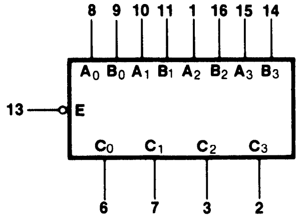
DIGITAL-ECL

E56
95H55



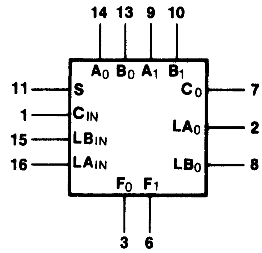
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E57
9578



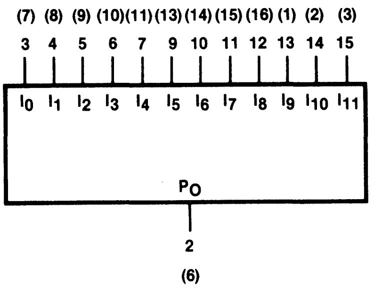
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E58
95H84



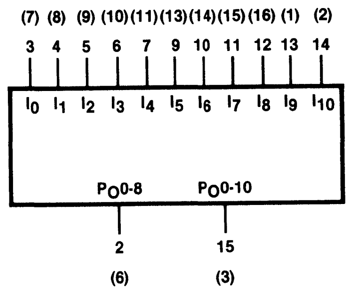
V_{CC} = GND = Pins 4, 5
V_{EE} = Pin 12

E59
10160/10560



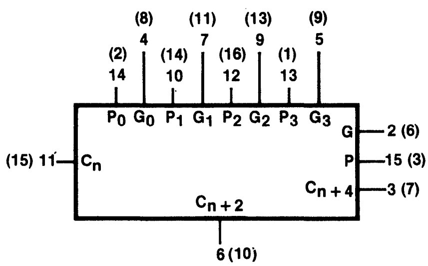
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E60
10170/10570



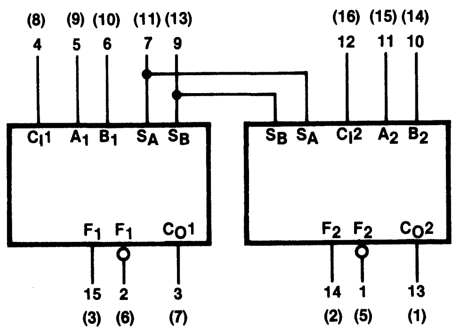
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E61
10179/10579



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E62
10180/10580

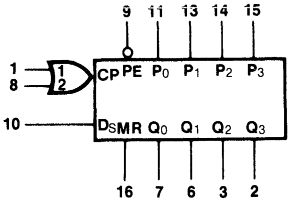


V_{CC} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

13

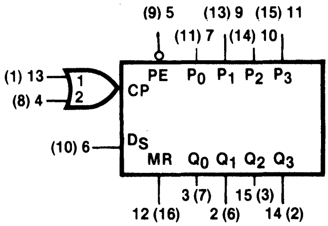
DIGITAL-ECL

E63
95H00



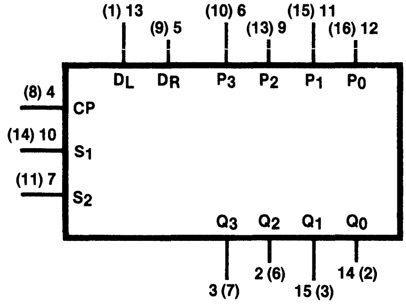
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E64
95000/10000



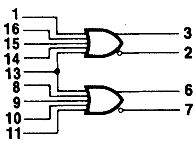
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E65
10141/10541



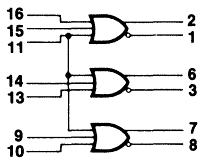
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E66
9502/95H02/
95H22/95L22



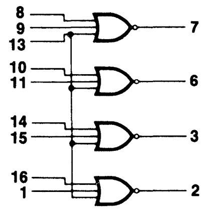
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E67
9503/95H03/
95H23/95L23



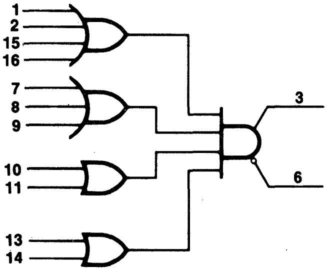
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E68
9504/95H04/
95H24/95L24



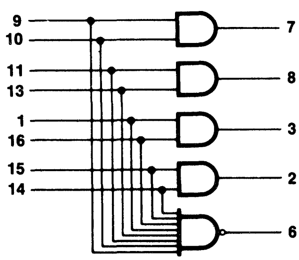
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E69
9505



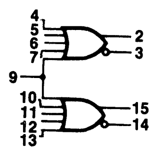
V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

E70
9507



V_{CC} = Pin 4
V_{CCA} = Pin 5
V_{EE} = Pin 12

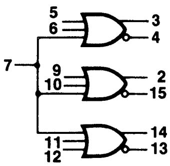
E71
95002



V_{CC1} = Pin 1
V_{CC2} = Pin 16
V_{EE} = Pin 8

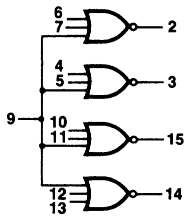
DIGITAL-ECL

E72
95003



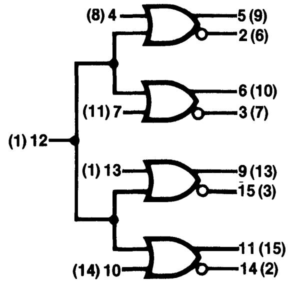
V_{CC1} = Pin 1
V_{CC2} = Pin 16
V_{EE} = Pin 8

E73
95004



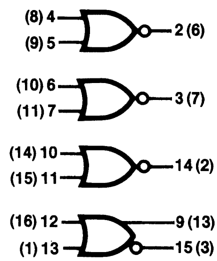
V_{CC1} = Pin 1
V_{CC2} = Pin 16
V_{EE} = Pin 8

E74
95101/10101/10501



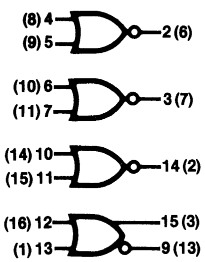
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E75
95102/10102/10502



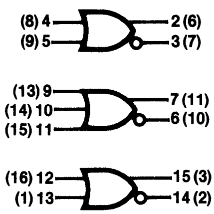
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E76
95103/10103/10503



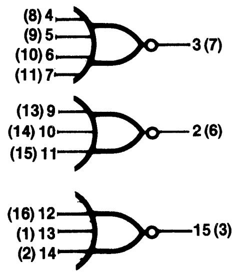
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E77
95105/10105/10505



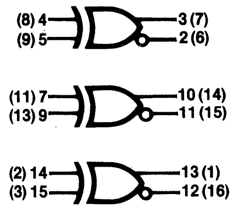
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E78
95106/10106/10506
10123/10523



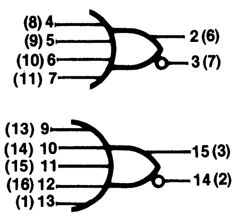
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E79
95107/10107/10507



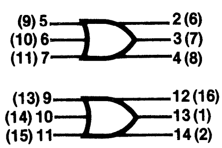
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E80
95109/10109/10509



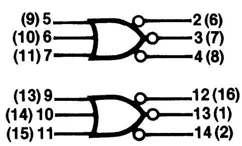
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E81
95110/10110/10210
10510/10610



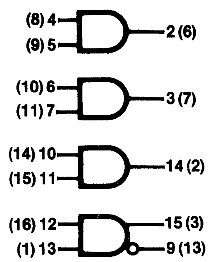
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E82
95111/10111/10211
10511/10611



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E83
10104/10504

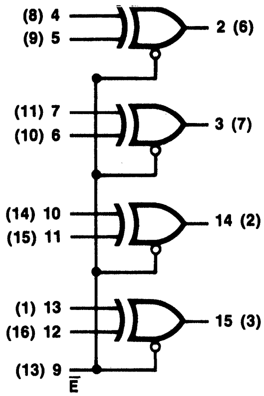


V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

13

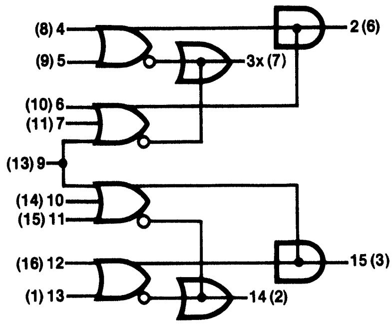
DIGITAL-ECL

E84
10113/10513



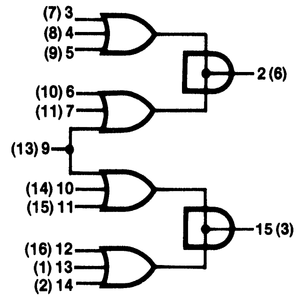
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E85
10117/10517



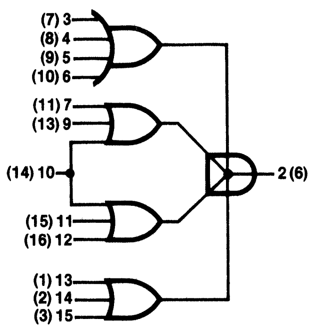
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E86
10118/10518



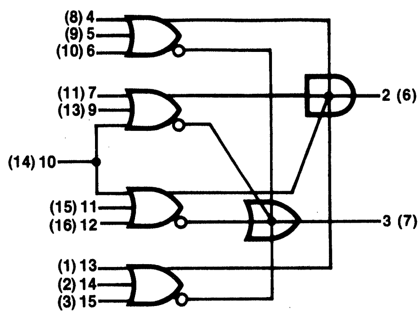
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E87
10119/10519



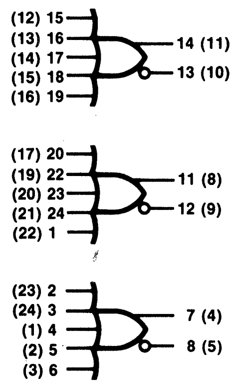
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E88
10121/10521



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

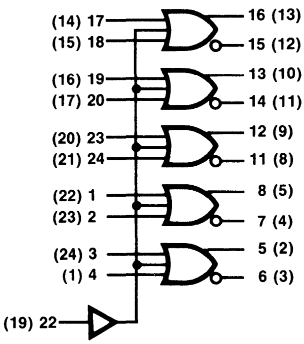
E89
100101



V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

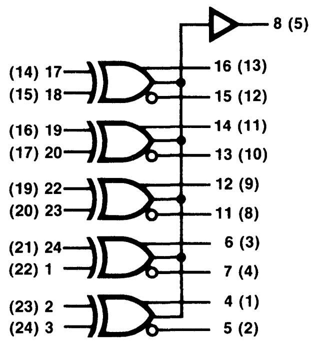
DIGITAL-ECL

E90
100102



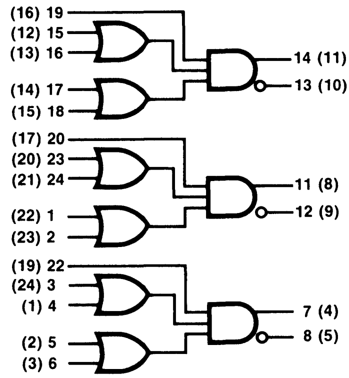
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E91
100107



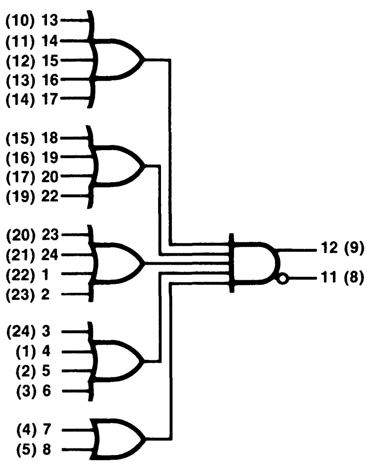
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E92
100117



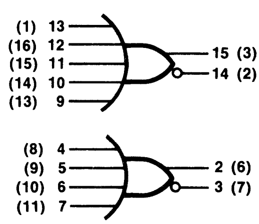
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E93
100118



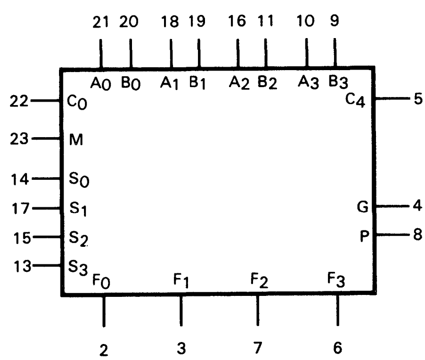
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E94
11C01



V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E95
10181/10581

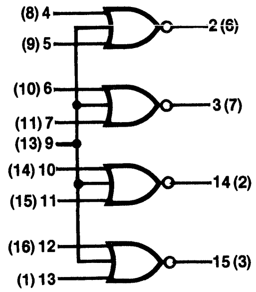


V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

13

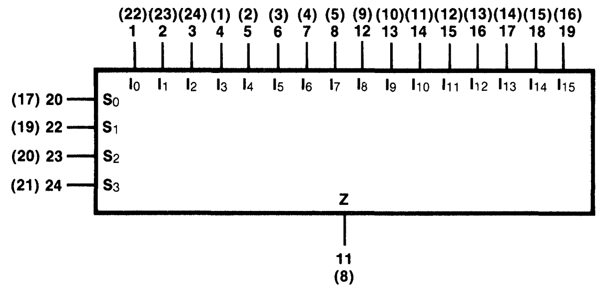
DIGITAL-ECL

E96
10100/10500



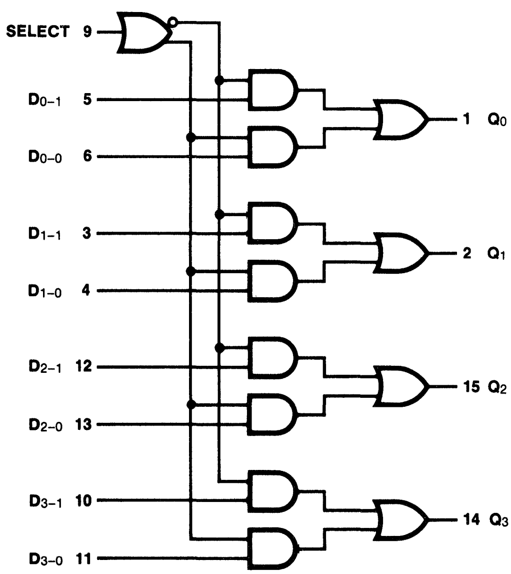
V_{CC1} = Pin 1 (5)
V_{CC2} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E97
100164



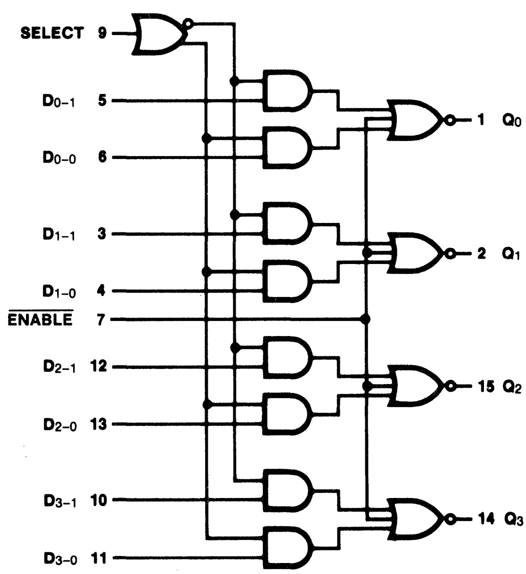
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E98
10158/10558



V_{CC} = Pin 16
V_{EE} = Pin 8

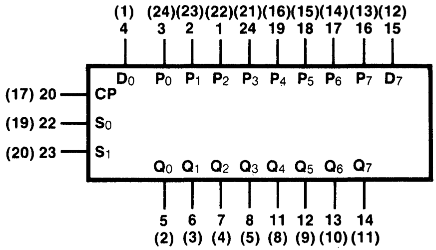
E99
10159/10559



V_{CC} = Pin 16
V_{EE} = Pin 8

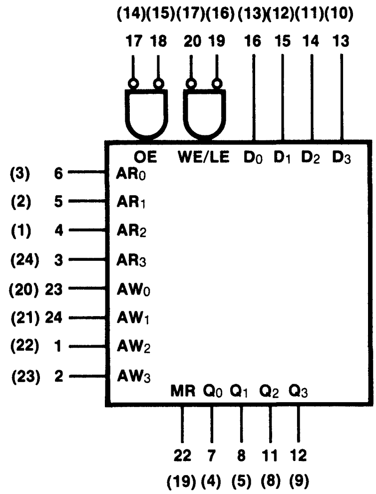
DIGITAL-ECL

E100
100141



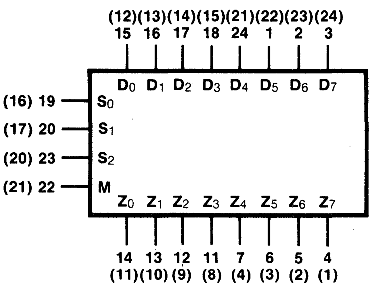
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E101
100145A



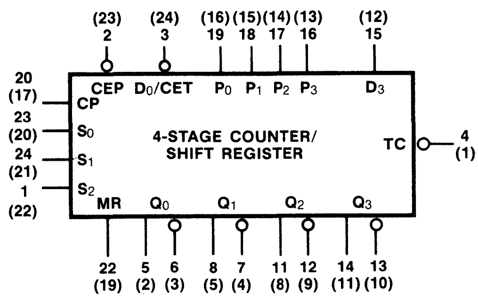
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E102
100158



V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E103
100136

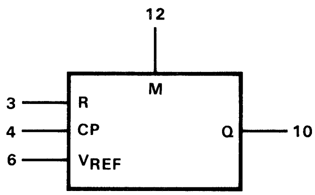


V_{CC} = Pin 9 (6)
V_{CCA} = Pins 8 (5), 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

13

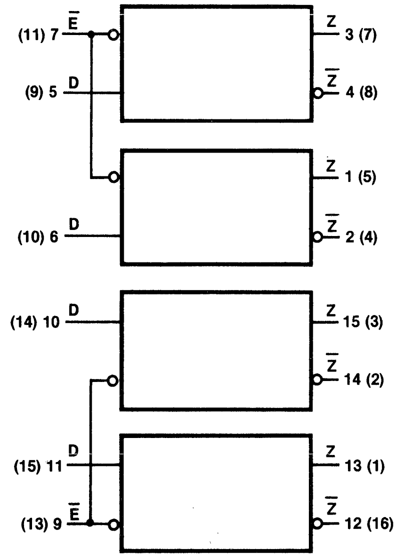
DIGITAL-ECL

E104
11C83



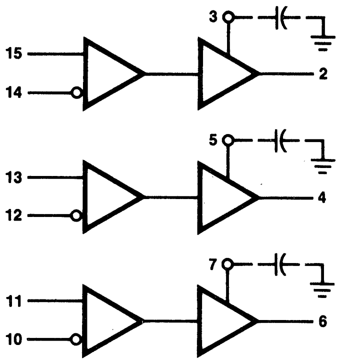
V_{CC} = Pin 1
V_{CCA} = Pin 14
GND = Pin 7

E105
10192/10592



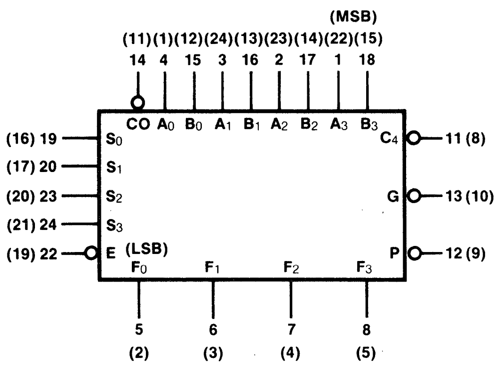
V_{CC} = Pin 16 (4)
V_{EE} = Pin 8 (12)
( ) = Flatpak

E106
10177/10577



V_{CC} = GND = Pins 1 (5), 16 (4)
V_{EE} = Pin 8 (12) = -5.2 V dc ± 5%
V_{SS} = Pin 9 (13) = +5.0 V dc or +6.0 V dc ± 10%

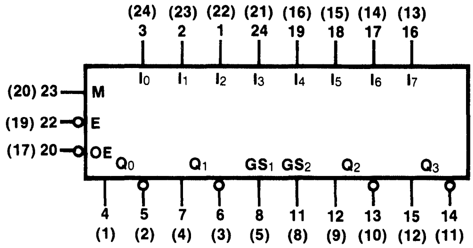
E107
100181



V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

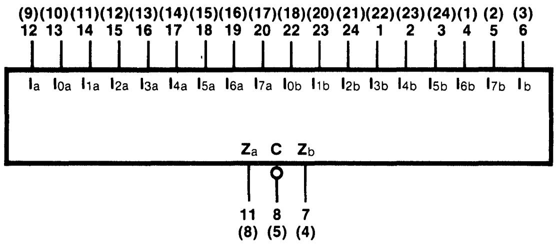
DIGITAL-ECL

E108
100165



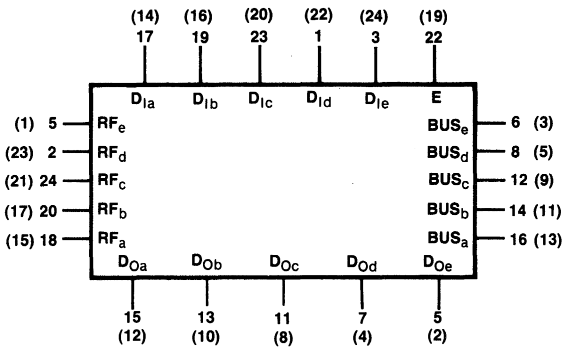
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E109
100160



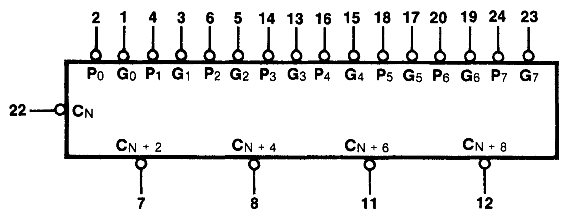
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E110
100194



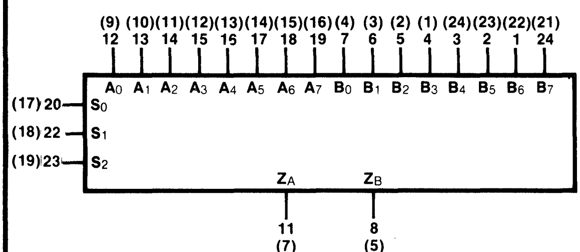
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E111
100179



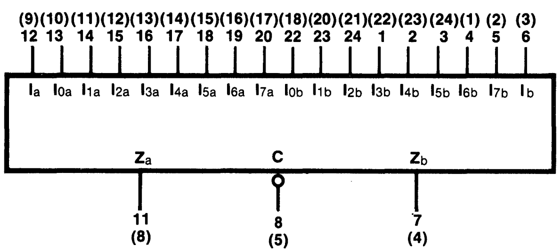
V_{CC} = Pin 9 (6)
V_{CCA} = Pin 10 (7)
V_{EE} = Pin 21 (18)
( ) = DIP

E112
100163



V_{CC} = 9 (6)
V_{CCA} = 10 (7)
V_{EE} = 21 (18)
( ) = DIP

E114
100166

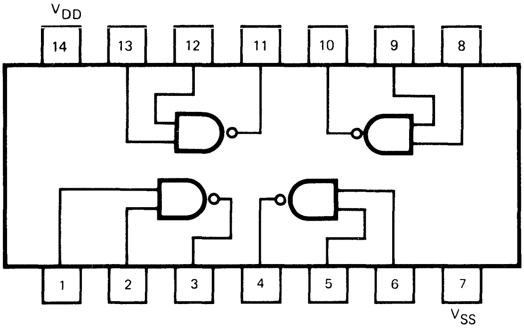


V_{CC} = Pin 9
V_{CCA} = Pin 10
V_{EE} = Pin 21
( ) = DIP

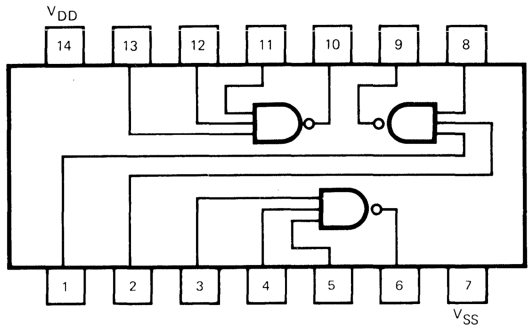
13

DIGITAL-CMOS

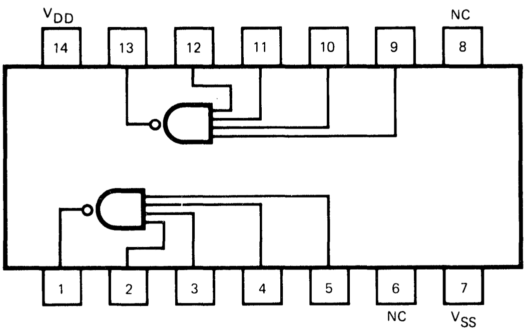
C1
4011B



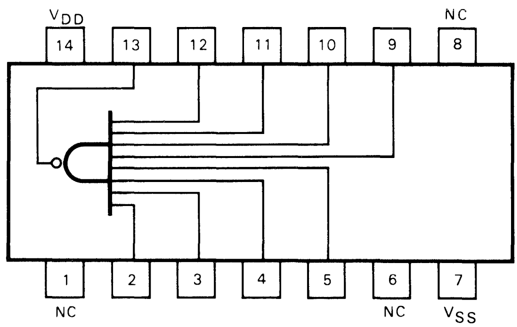
C2
4023B



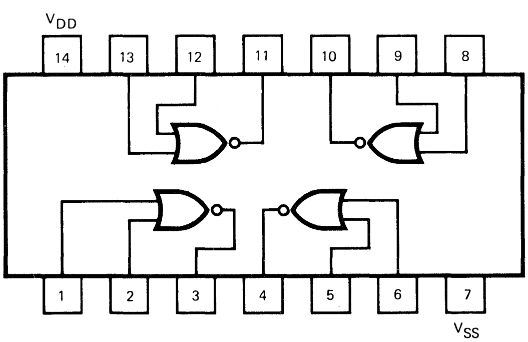
C3
4012B



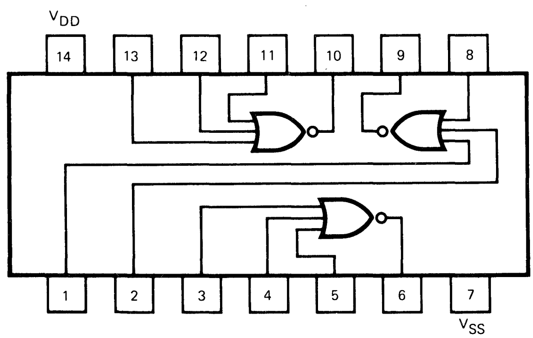
C4
4068B



C5
4001B



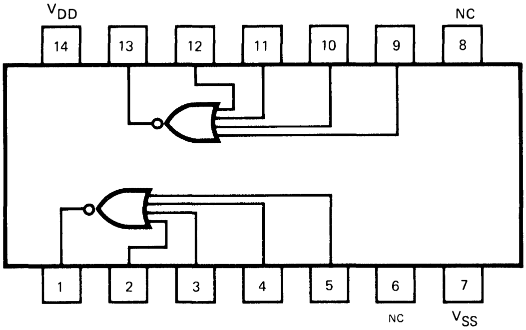
C6
4025B



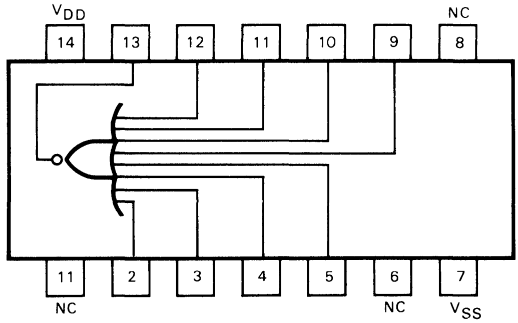
NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

DIGITAL-CMOS

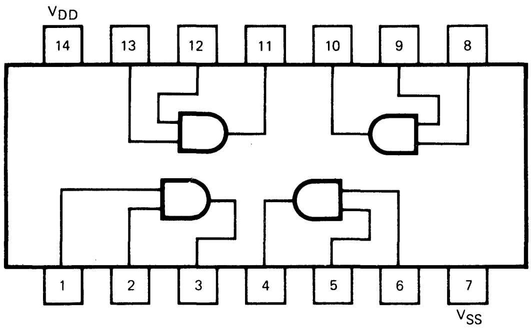
C7
4002B



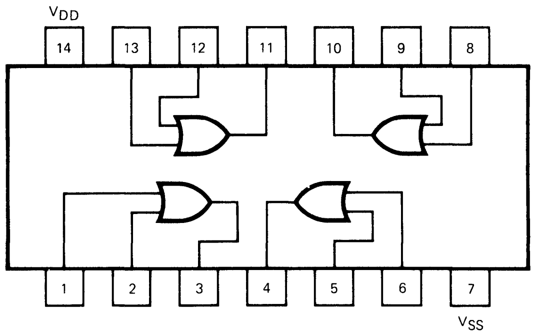
C8
4078B



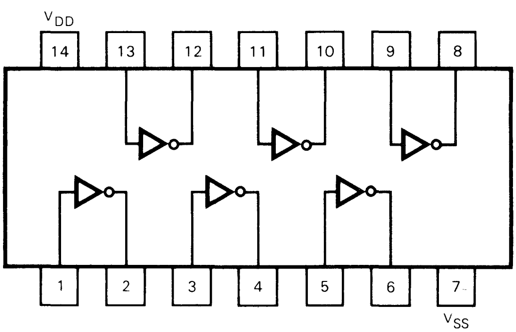
C9
4081B



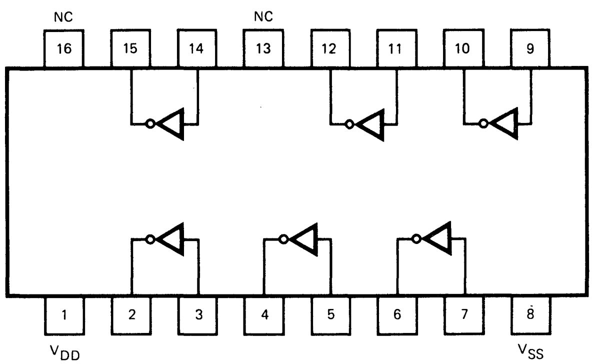
C10
4071B



C11
4069B, 40014B



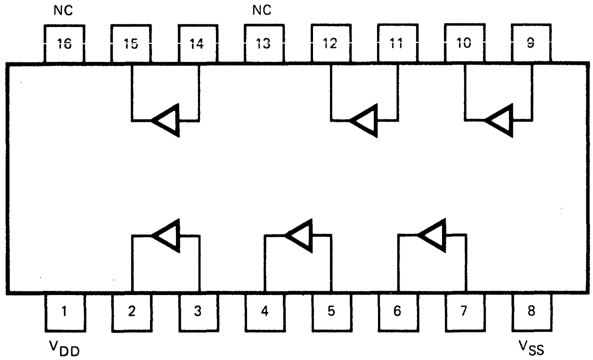
C12
4049B



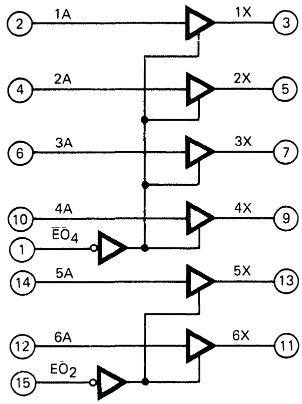
NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

DIGITAL-CMOS

C13
4050B

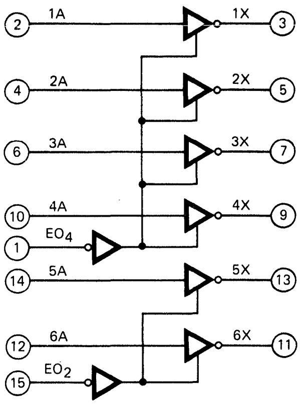


C15
40097B



V_{DD} = Pin 16
V_{SS} = Pin 8

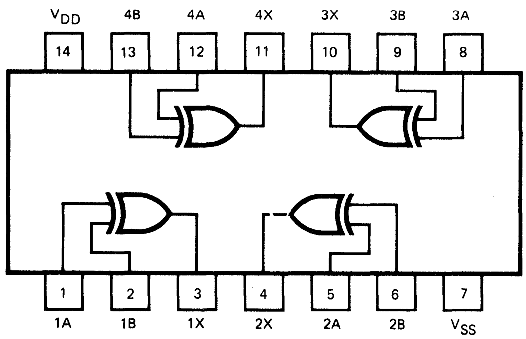
C14
40098B



V_{DD} = Pin 16
V_{SS} = Pin 8

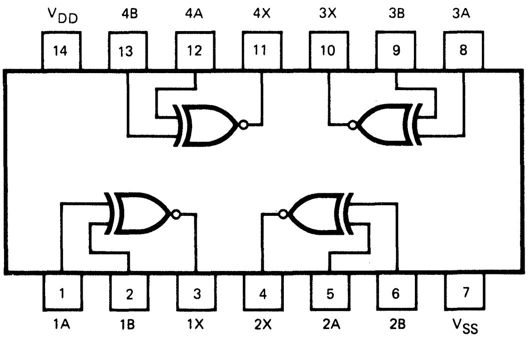
C16
4030B, 4070B

$X = \overline{A}B + A\overline{B}$



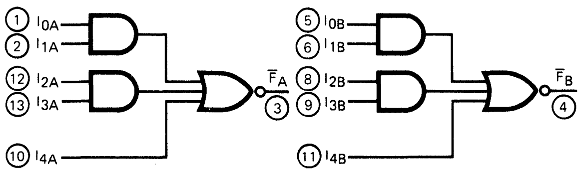
C17
4077B

$X = AB + \overline{A}\overline{B}$



C18
4085B

$\overline{F} = \overline{I_0 \cdot I_1 + I_2 \cdot I_3 + I_4}$

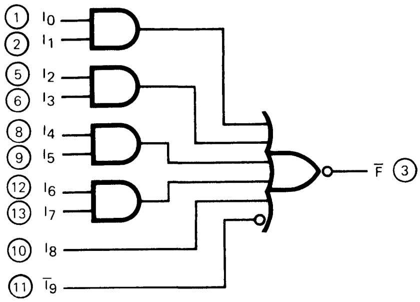


V_{DD} = Pin 14
V_{SS} = Pin 7

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

DIGITAL-CMOS

C19
4086B

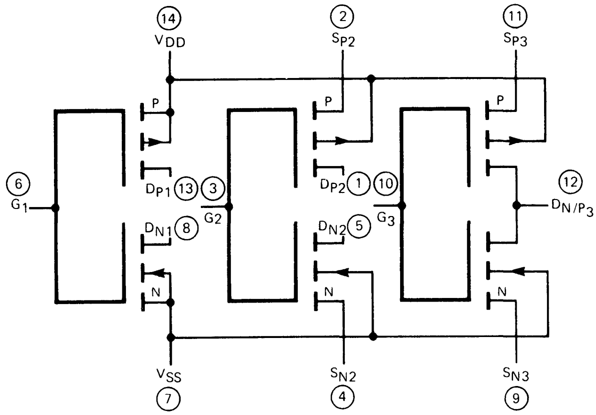


$\overline{F} = \overline{I_0 \bullet I_1 + I_2 \bullet I_3 + I_4 \bullet I_5 + I_6 \bullet I_7 + I_8 + I_9}$

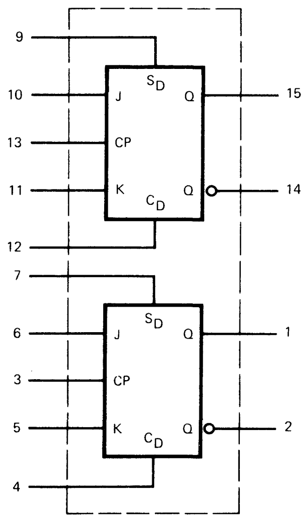
NOTE:
A HIGH on I_8 or a LOW on I_9 forces the output ($\overline{F}$) LOW.

V_{DD} = Pin 14 V_{SS} = Pin 7 NC = Pin 4

C20
4007B

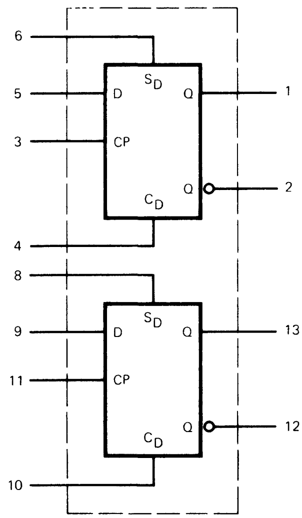


C21
4027B



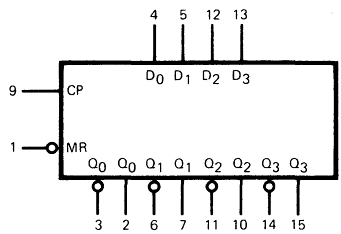
V_{DD} = Pin 16
V_{SS} = Pin 8

C22
4013B



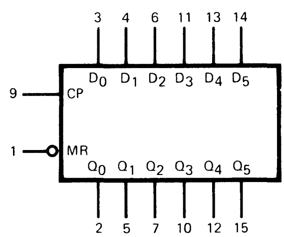
V_{DD} = Pin 14
V_{SS} = Pin 7

C23
40175B



V_{DD} = Pin 16
V_{SS} = Pin 8

C24
40174B



V_{DD} = Pin 16
V_{SS} = Pin 8

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

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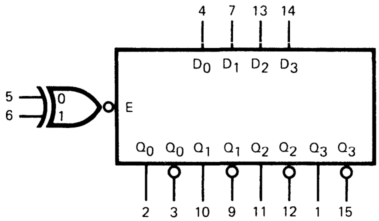
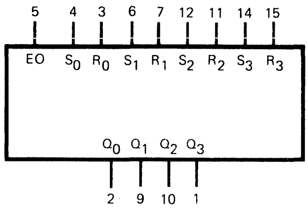
DIGITAL-CMOS

C25
4042B



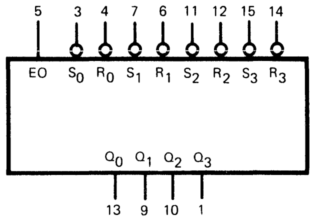
V_{DD} = Pin 16
V_{SS} = Pin 8

C26
4043B



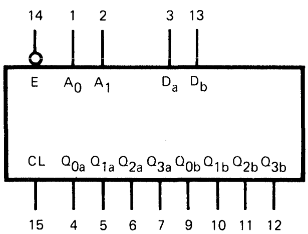
V_{DD} = Pin 16
V_{SS} = Pin 8
NC = Pin 13

C27
4044B



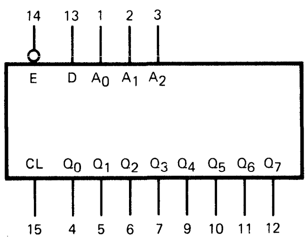
V_{DD} = Pin 16
V_{SS} = Pin 8
NC = Pin 2

C28
4723B



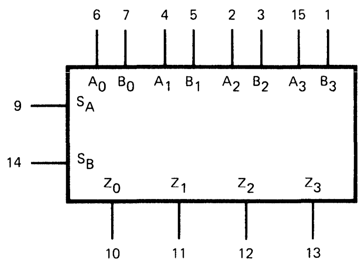
V_{DD} = Pin 16
V_{SS} = Pin 8

C29
4724B



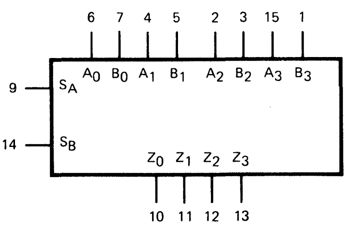
V_{DD} = Pin 16
V_{SS} = Pin 8

C30
4019B



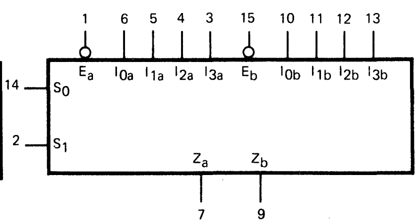
V_{DD} = Pin 16
V_{SS} = Pin 8

C31
4519B



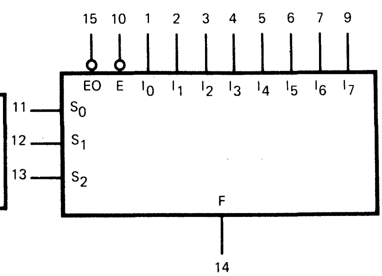
V_{DD} = Pin 16
V_{SS} = Pin 8

C32
4539B



V_{DD} = Pin 16
V_{SS} = Pin 8

C33
4512B

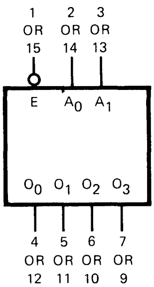


V_{DD} = Pin 16
V_{SS} = Pin 8

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

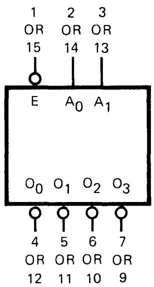
DIGITAL-CMOS

C34
4555B



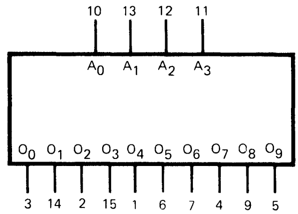
V_{DD} = Pin 16
V_{SS} = Pin 8

C35
4556B



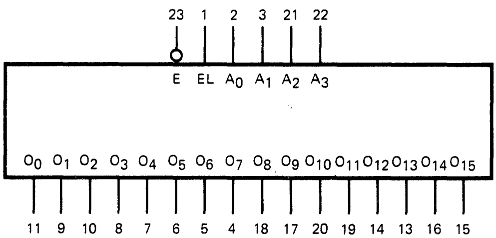
V_{DD} = Pin 16
V_{SS} = Pin 8

C36
4028B



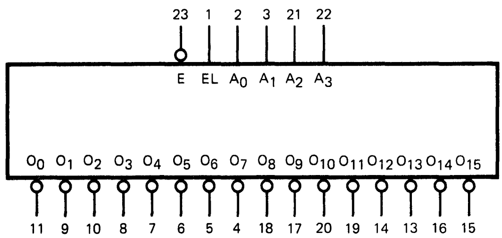
V_{DD} = Pin 16
V_{SS} = Pin 8

C37
4514B



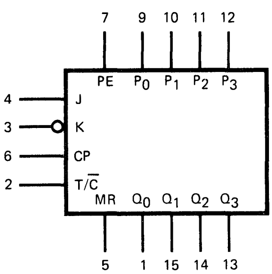
V_{DD} = Pin 24
V_{SS} = Pin 12

C38
4515B



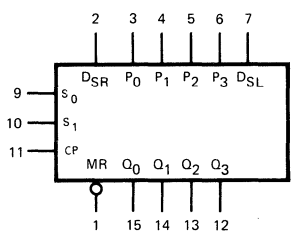
V_{DD} = Pin 24
V_{SS} = Pin 12

C39
4035B



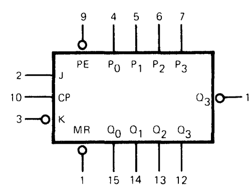
V_{DD} = Pin 16
V_{SS} = Pin 8

C40
40194B



V_{DD} = Pin 16
V_{SS} = Pin 8

C41
40195B



V_{DD} = Pin 16
V_{SS} = Pin 8

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

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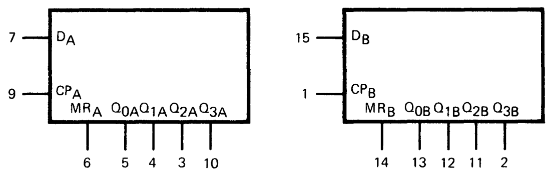
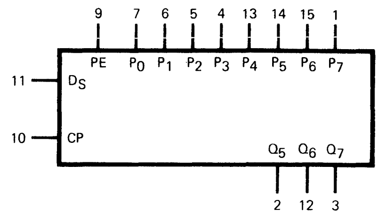
DIGITAL-CMOS

C42
4015B



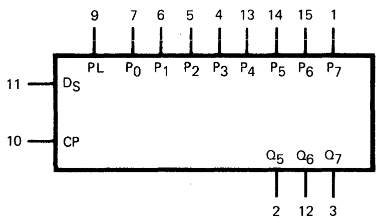
V_{DD} = Pin 16
V_{SS} = Pin 8

C43
4014B



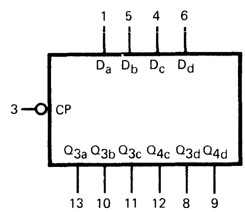
V_{DD} = Pin 16
V_{SS} = Pin 8

C44
4021B



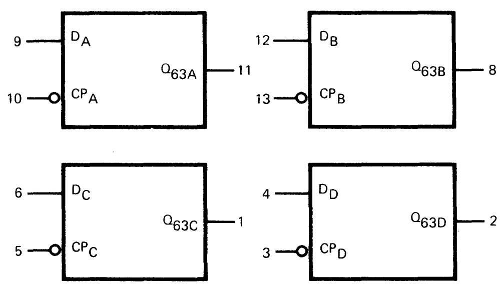
V_{DD} = Pin 16
V_{SS} = Pin 8

C45
4006B



V_{DD} = Pin 14
V_{SS} = Pin 7
NC = Pin 2

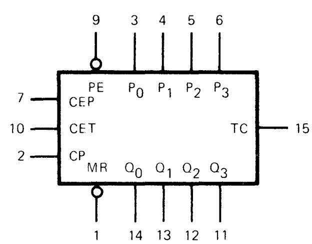
C46
4731B *



V_{DD} = Pin 14
V_{SS} = Pin 7

*Pinout shown is for dual in-line package only.
See CMOS databook for flatpak pinout.

C47
40160B, 40161B

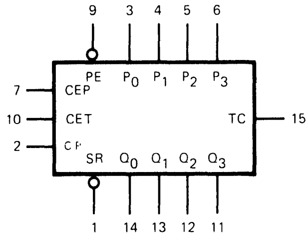


V_{DD} = Pin 16
V_{SS} = Pin 8

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

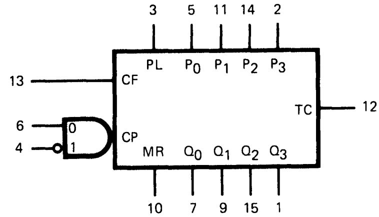
DIGITAL-CMOS

C48
40162B, 40163B



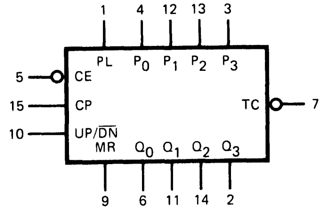
V_{DD} = Pin 16
V_{SS} = Pin 8

C49
4522B, 4526B



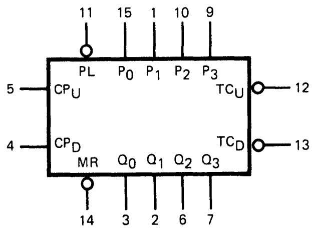
V_{DD} = Pin 16
V_{SS} = Pin 8

C50
4510B, 4516B



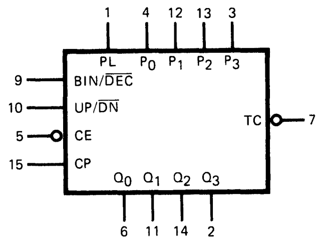
V_{DD} = Pin 16
V_{SS} = Pin 8

C51
40192B, 40193B



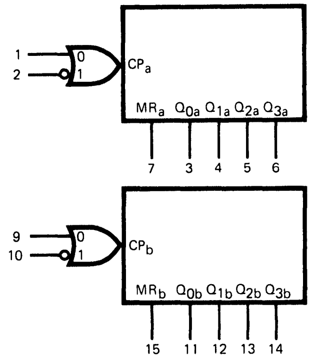
V_{DD} = Pin 16
V_{SS} = Pin 8

C52
4029B



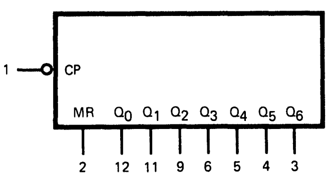
V_{DD} = Pin 16
V_{SS} = Pin 8

C53
4518B, 4520B



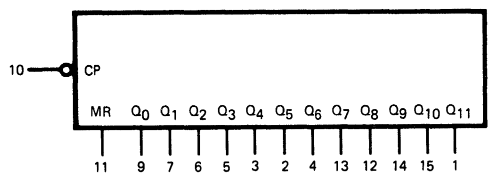
V_{DD} = Pin 16
V_{SS} = Pin 8

C54
4024B



V_{DD} = Pin 14
V_{SS} = Pin 7
NC = Pins 8, 10 and 13

C55
4040B

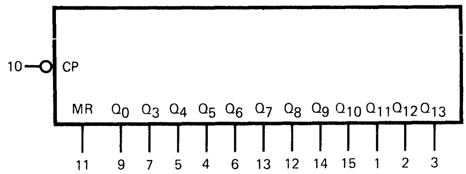


V_{DD} = Pin 16
V_{SS} = Pin 8

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

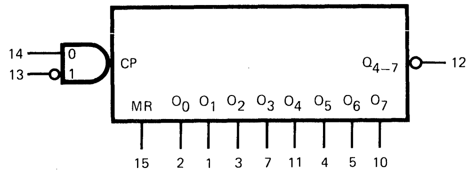
DIGITAL-CMOS

C56
4020B



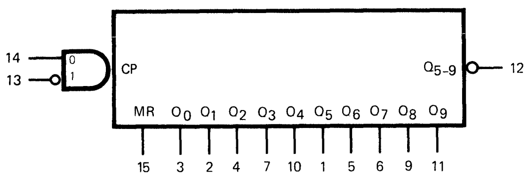
V_{DD} = Pin 16
V_{SS} = Pin 8

C57
4022B



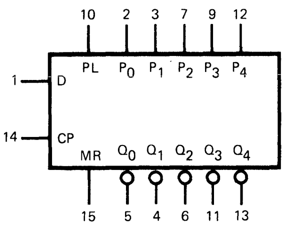
V_{DD} = Pin 16
V_{SS} = Pin 8
NC = Pin 6, 9

C58
4017B



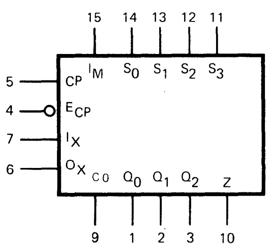
V_{DD} = Pin 16
V_{SS} = Pin 8

C59
4018B



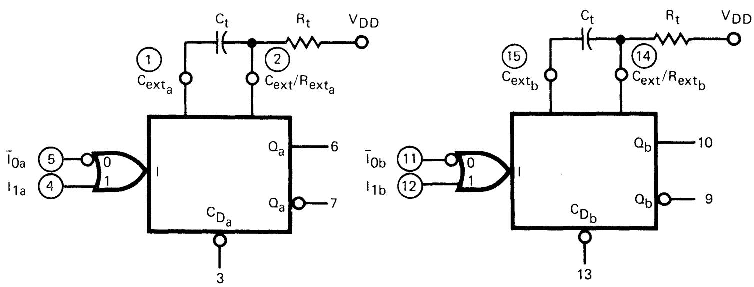
V_{DD} = Pin 16
V_{SS} = Pin 8

C60
4702B



V_{DD} = Pin 16
V_{SS} = Pin 8

C61
4528B

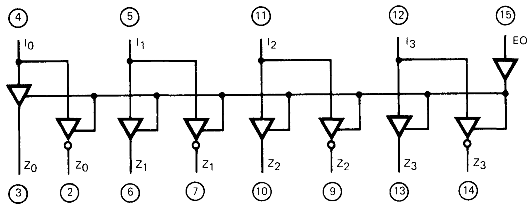


V_{DD} = Pin 16
V_{SS} = Pin 8

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

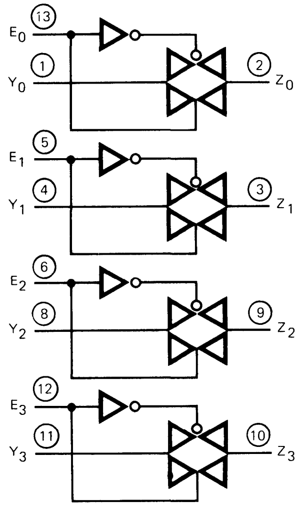
DIGITAL-CMOS

C62
4104B



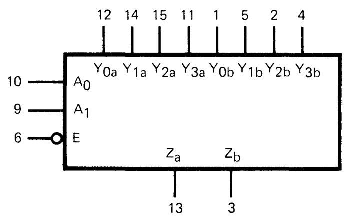
V_{DDO} = Pin 1
V_{DDI} = Pin 16
V_{SS} = Pin 8

C63
4016B, 4066B



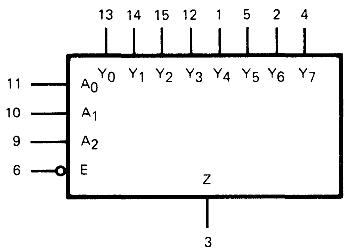
V_{DD} = Pin 14
V_{SS} = Pin 7

C64
4052B



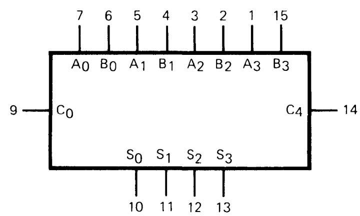
V_{DD} = Pin 16
V_{SS} = Pin 8
V_{EE} = Pin 7

C65
4051B



V_{DD} = Pin 16
V_{SS} = Pin 8
V_{EE} = Pin 7

C66
4008B



V_{DD} = Pin 16
V_{SS} = Pin 8

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

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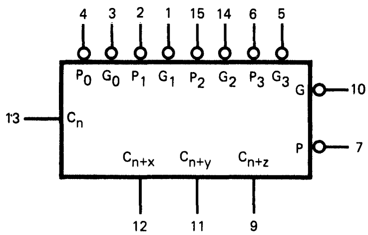
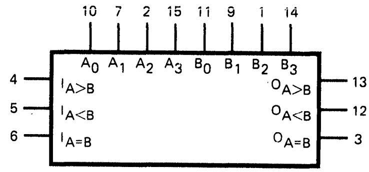
DIGITAL-CMOS

C68
4582B



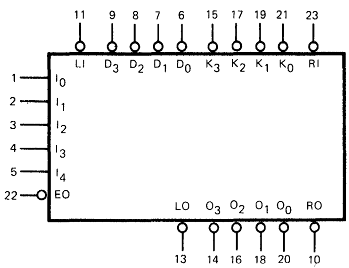
V_{DD} = Pin 16
V_{SS} = Pin 8

C69
40085B



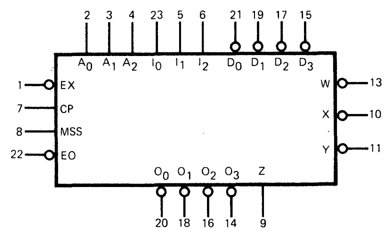
V_{DD} = Pin 16
V_{SS} = Pin 8

C70
4704B



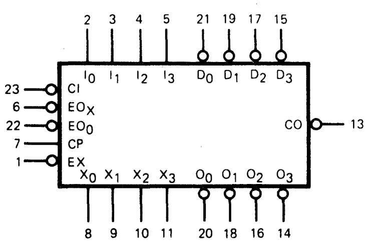
V_{DD} = Pin 24
V_{SS} = Pin 12

C71
4705B



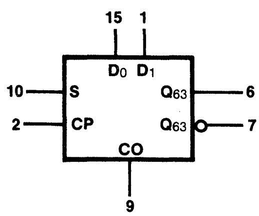
V_{DD} = Pin 24
V_{SS} = Pin 12

C72
4707B



V_{DD} = Pin 24
V_{SS} = Pin 12

C78
4031B

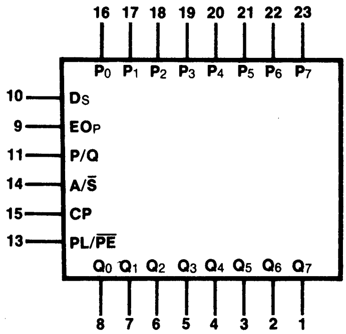


V_{DD} = Pin 16
V_{SS} = Pin 8
NC = Pins 3, 4, 5, 11, 12, 13, 14

NOTE: The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-Line Packages.

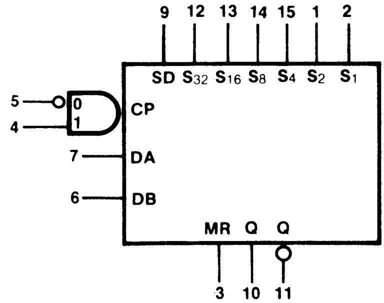
DIGITAL-CMOS

C79
4034B



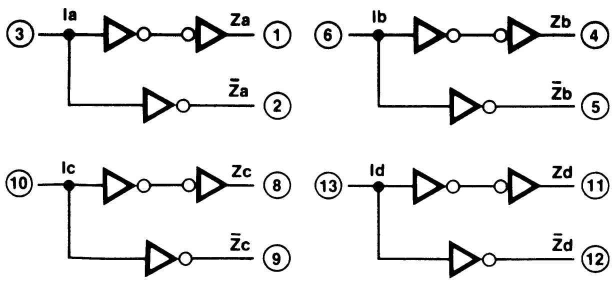
V_{DD} = Pin 24
V_{SS} = Pin 12

C80
4557B



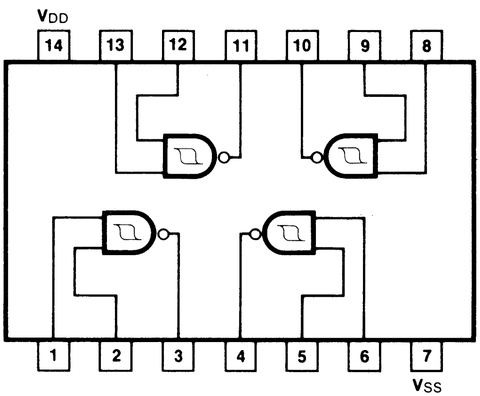
V_{DD} = Pin 16
V_{SS} = Pin 8

C81
4041



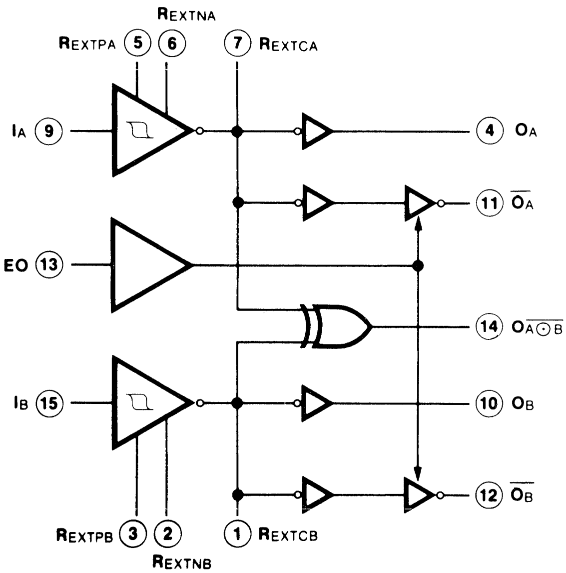
V_{DD} = Pin 14
V_{SS} = Pin 7

C82
4093B



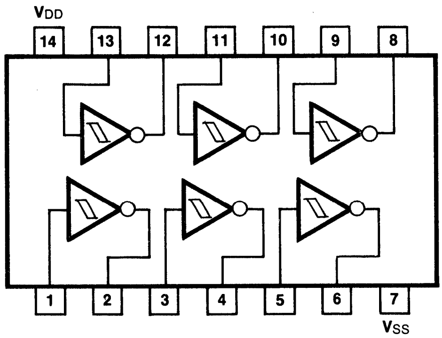
DIGITAL-CMOS

C83
4583B

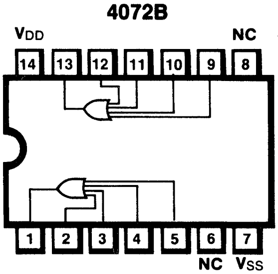


V_{DD} = Pin 16
V_{SS} = Pin 8
○ = Pin Numbers

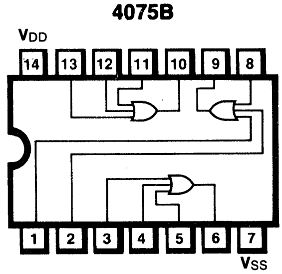
C84
40014B



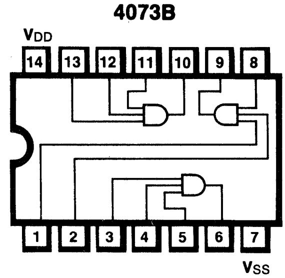
C85
4072B



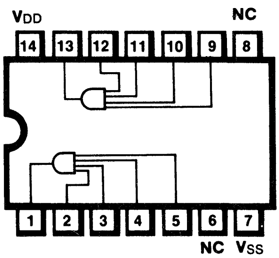
C86
4075B



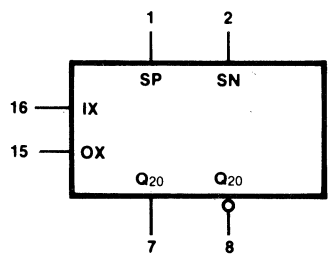
C87
4073B



C88
4082B

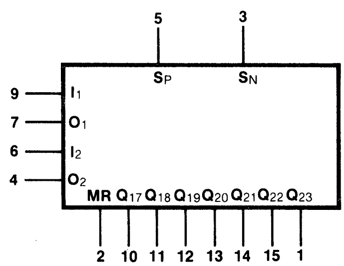


C89
4045B



V_{DD} = Pin 3
V_{SS} = Pin 14
NC = Pins 4, 5, 6, 9, 10, 11, 12, & 13

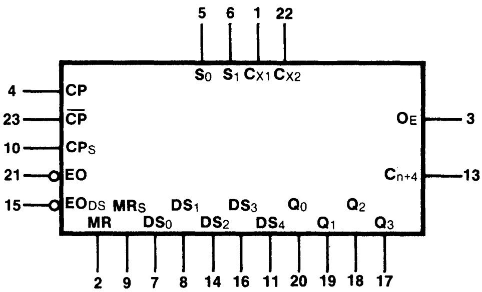
C90
4521B



V_{DD} = Pin 16
V_{SS} = Pin 8

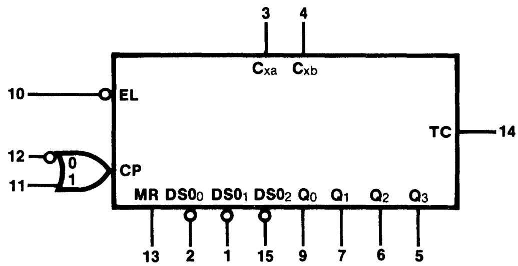
DIGITAL-CMOS

C91
4534B



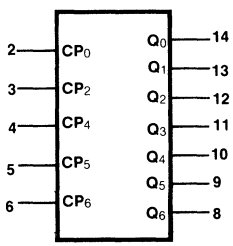
V_{DD} = Pin 24
V_{SS} = Pin 12

C92
4553B



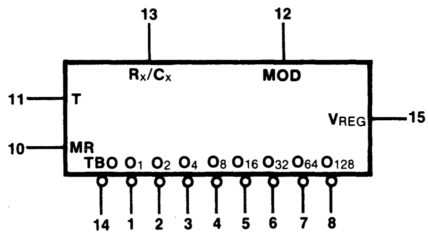
V_{DD} = Pin 16
V_{SS} = Pin 8

C93
4727B



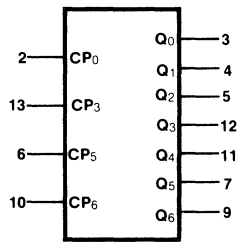
V_{DD} = Pin 7
V_{SS} = Pin 1

C94
4722B



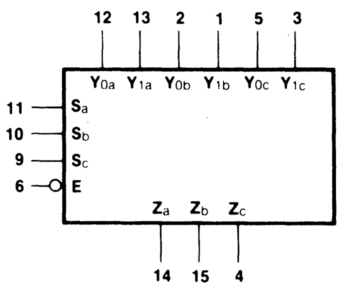
V_{DD} = Pin 16
V_{SS} = Pin 8

C95
4737B



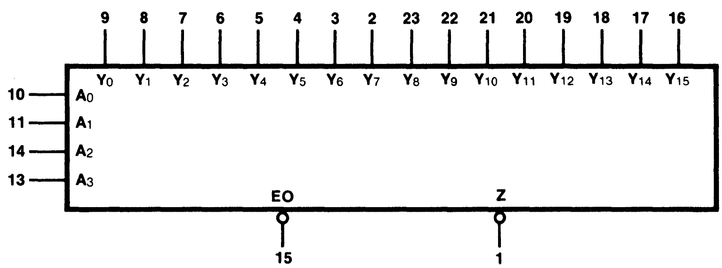
V_{DD} = Pin 1
V_{SS} = Pin 8
NC = Pin 14

C96
4053B



V_{DD} = Pin 16
V_{SS} = Pin 8
V_{EE} = Pin 7

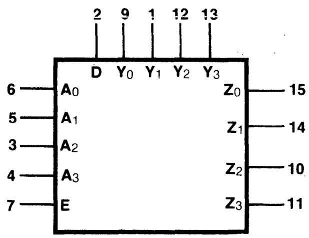
C97
4067B



V_{DD} = Pin 24
V_{SS} = Pin 12

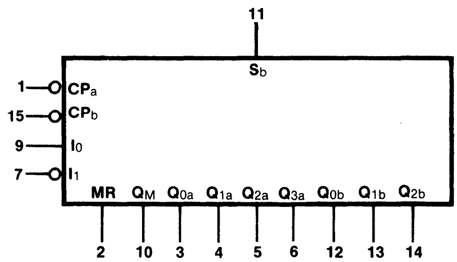
DIGITAL-CMOS

C98
4741B



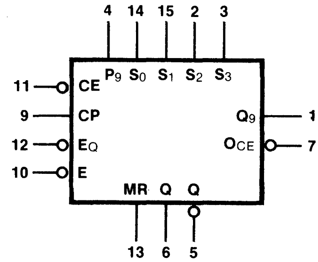
V_{DD} = Pin 16
V_{SS} = Pin 8

C99
4566B



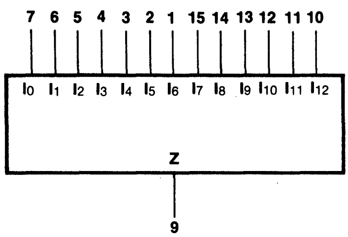
V_{DD} = Pin 16
V_{SS} = Pin 8

C103
4527B



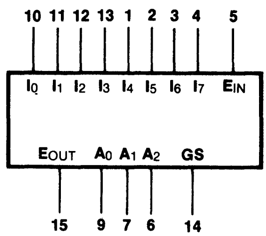
V_{DD} = Pin 16
V_{SS} = Pin 8

C104
4531B



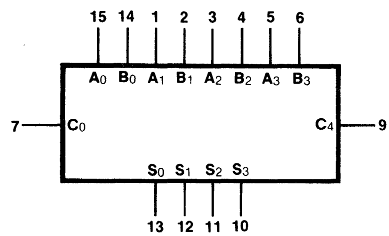
V_{DD} = Pin 16
V_{SS} = Pin 8

C105
4532B



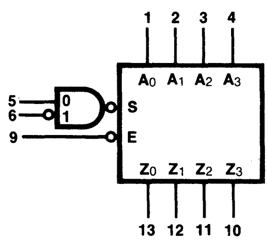
V_{DD} = Pin 16
V_{SS} = Pin 8

C106
4560B



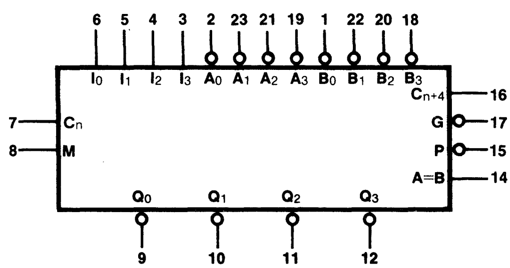
V_{DD} = Pin 16
V_{SS} = Pin 8

C107
4561B



V_{DD} = Pin 14
V_{SS} = Pin 7
NC = Pin 8

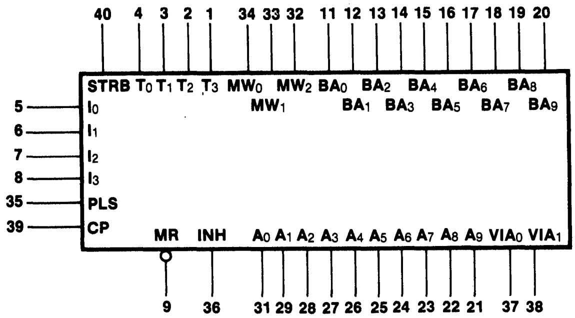
C108
4581B



V_{DD} = Pin 24
V_{SS} = Pin 12

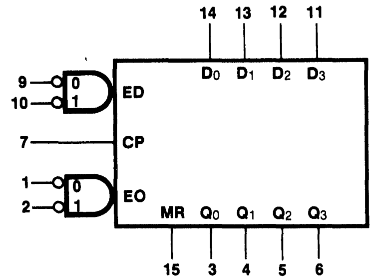
DIGITAL-CMOS

C109
4708B



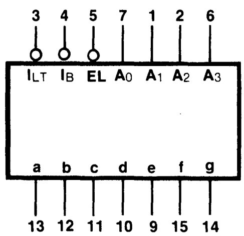
V_{DD} = Pin 10
V_{SS} = Pin 30

C110
4076B



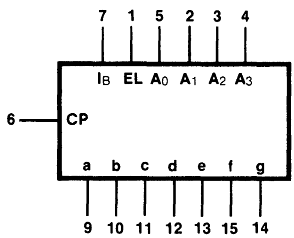
V_{DD} = Pin 16
V_{SS} = Pin 8

C111
4511B



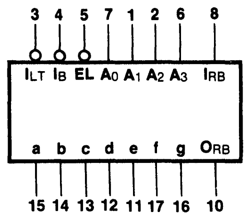
V_{DD} = Pin 16
V_{SS} = Pin 8

C112
4543B



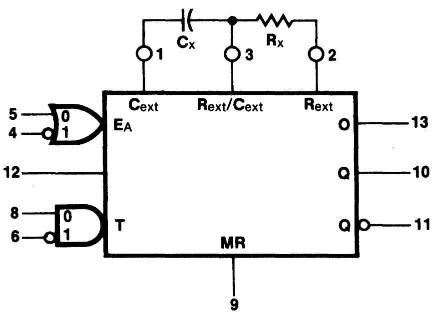
V_{DD} = Pin 18
V_{SS} = Pin 9

C114
4734B



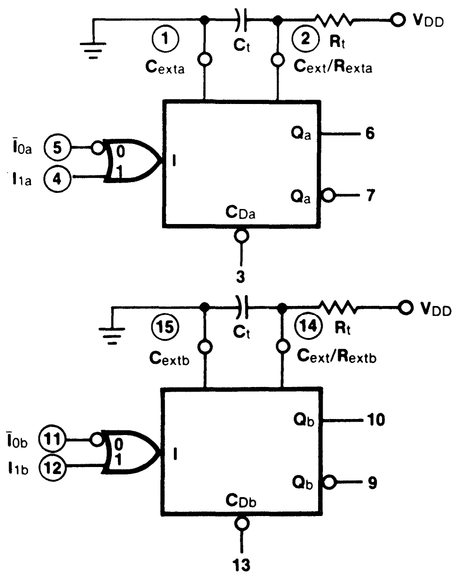
V_{DD} = Pin 16
V_{SS} = Pin 8

C115
4047B



V_{DD} = Pin 14
V_{SS} = Pin 7

C116
4538B

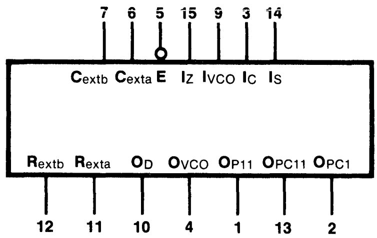


V_{DD} = Pin 16
V_{SS} = Pin 8

13

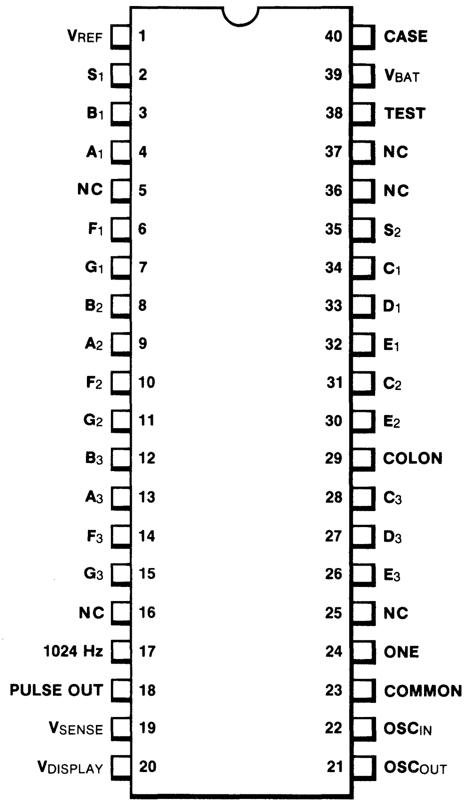
DIGITAL-CMOS

C117
4046B



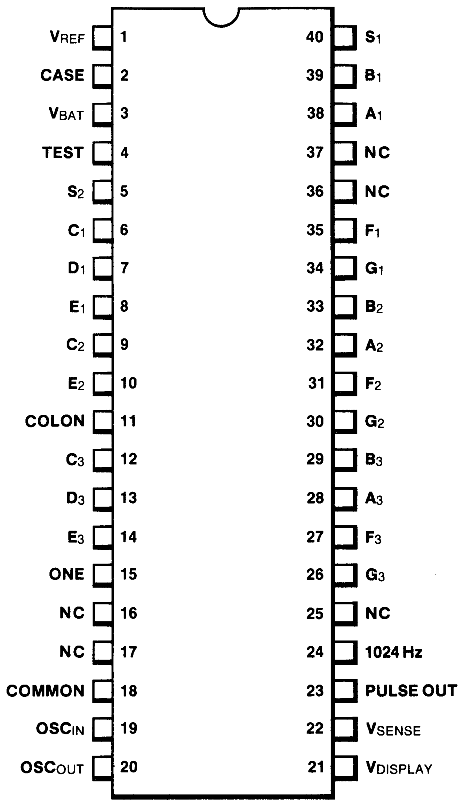
V_{DD} = Pin 16
V_{SS} = Pin 8

C118
FWB6013

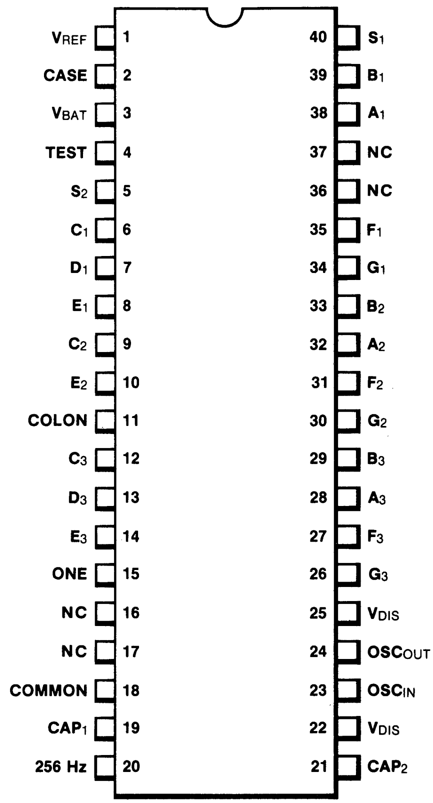


DIGITAL-CMOS

C119
FWB6003



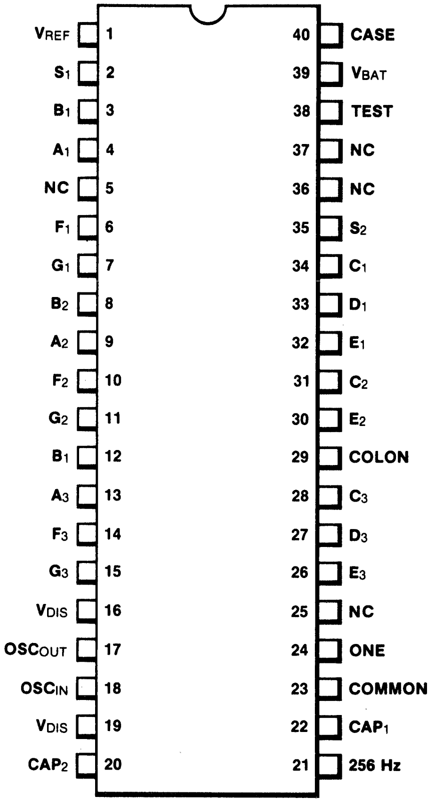
C120
FWB6005



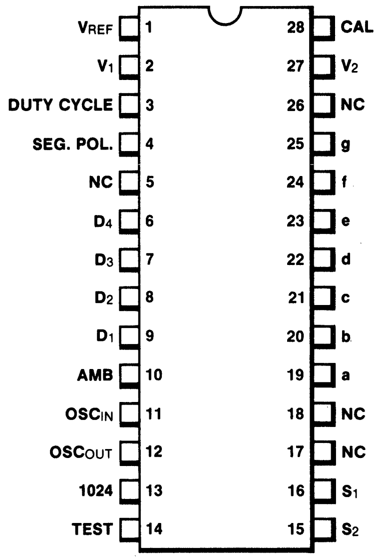
13

DIGITAL-CMOS

C121
FWB6105

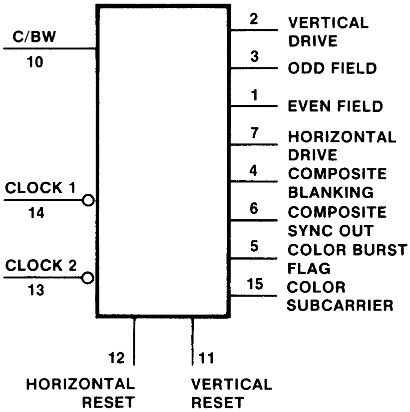


C122
FWB6004



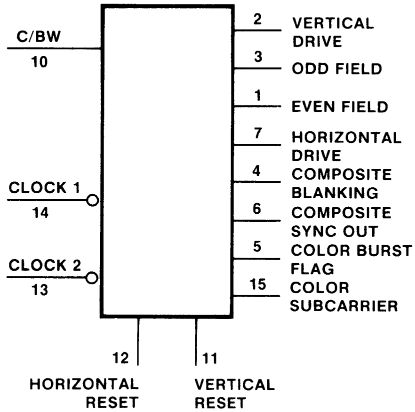
DIGITAL-MOS

S1
3262A



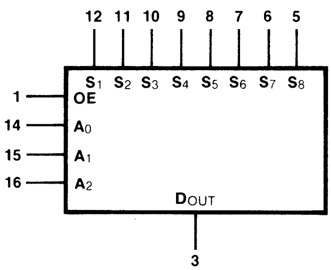
V_{SS} = Pin 16
V_{DD} = Pin 9
V_{GG} = Pin 8

S2
3262B



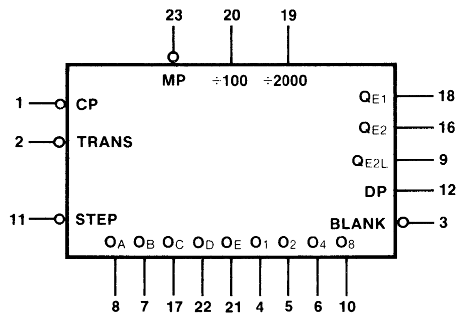
V_{SS} = Pin 16
V_{DD} = Pin 9
V_{GG} = Pin 8

S3
3708



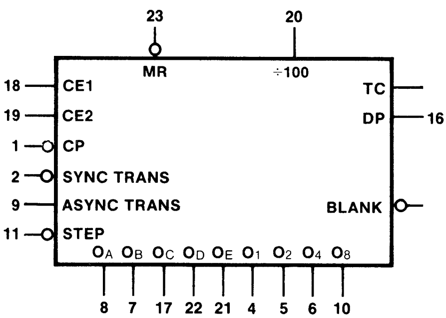
V_{SS} = Pins 2 and 4
V_{DD} = Pin 13

S4
3814



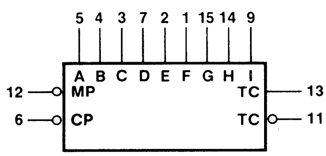
V_{SS} = Pin 24
V_{GG} = Pin 15
V_{DD} = Pin 13

S5
3815



V_{SS} = +5 V ± 5% = Pin 24
V_{DD} = GND = Pin 13
V_{GG} = 12 V ± 5% = Pin 15

S6
3816

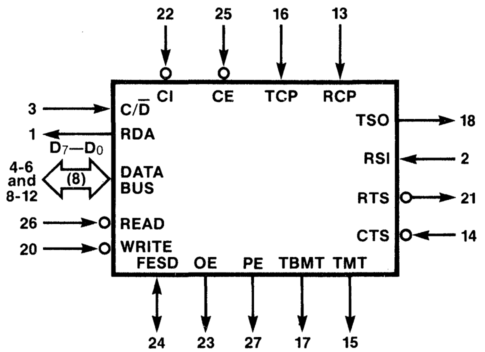


V_{SS} = Pin 16
V_{DD} = Pin 8
V_{GG} = Pin 10

13

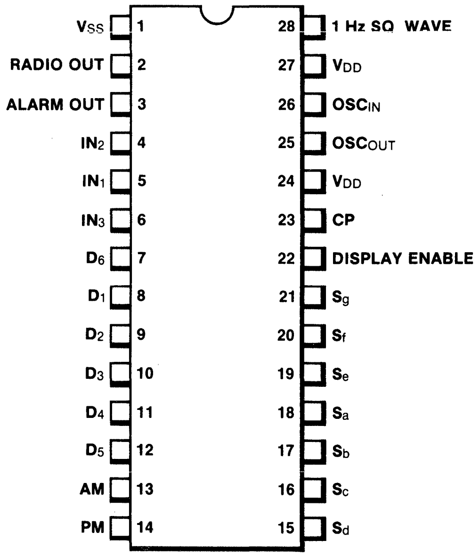
DIGITAL-MOS

S8
F3843

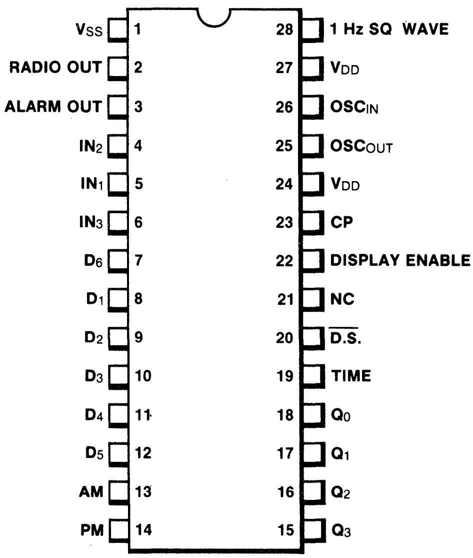


V_{CC} (+5 V) = Pin 28
V_{DD} (+12 V) = Pin 7
V_{SS} (GND) = Pin 19

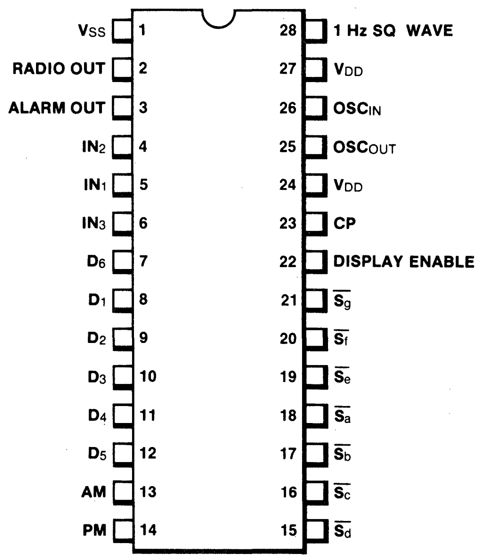
S9
FCM7001/FCM7004



S10
FCM7002

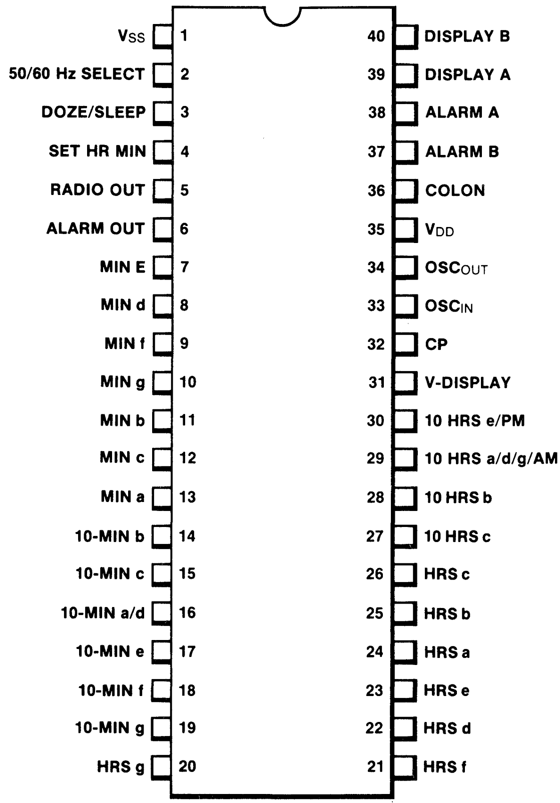


S11
FCM7003



DIGITAL-MOS

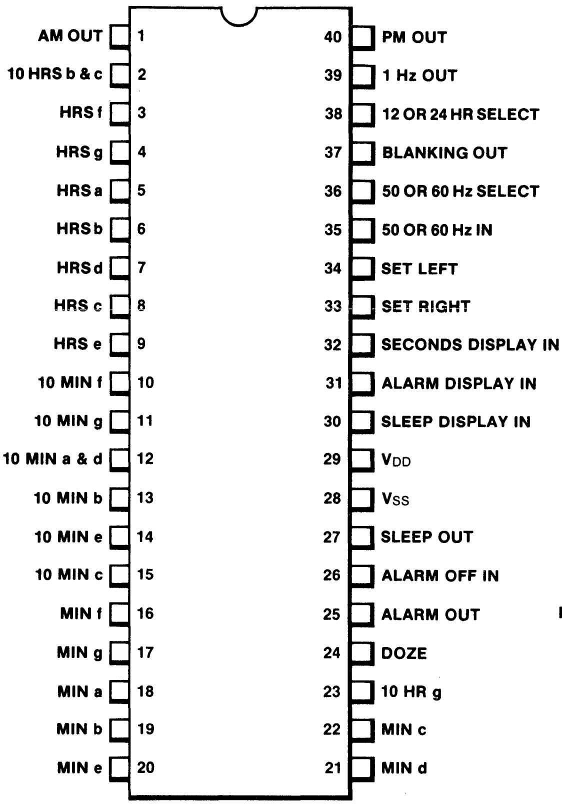
S12
FCM7010/FCM7015



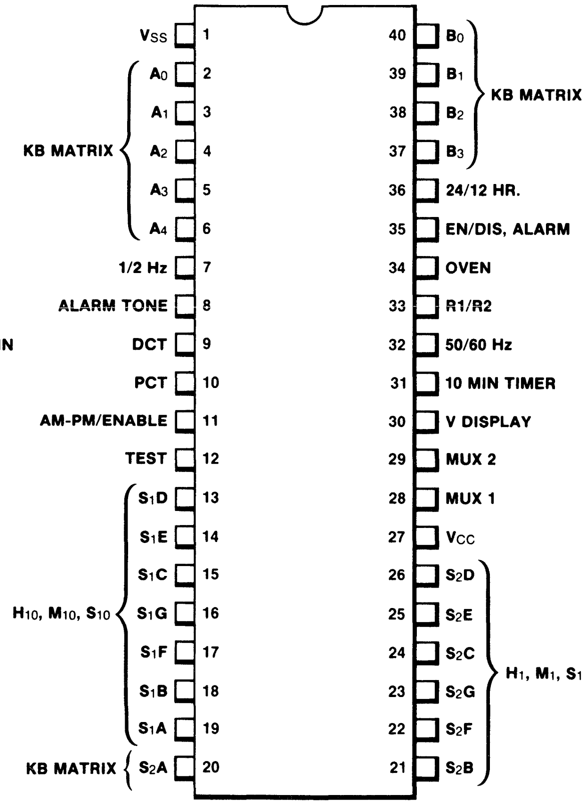
13

DIGITAL-MOS

S13
FCM7030

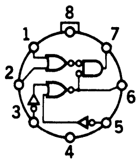


S14
FCM7040

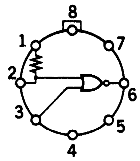


DIGITAL-RTL/CTL

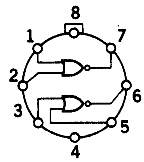
F1
908



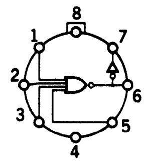
F2
909



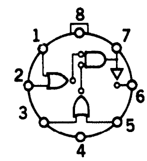
F3
910



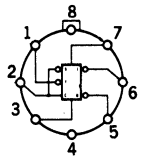
F4
911



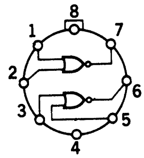
F5
912



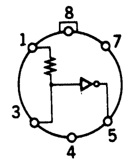
F6
913



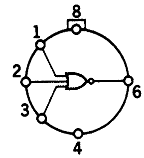
F7
921



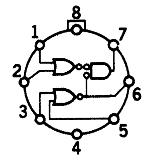
F8
900



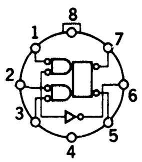
F9
903



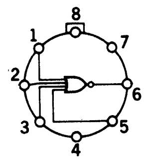
F10
904



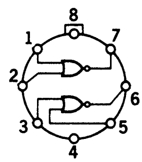
F11
905



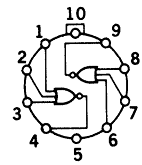
F12
907



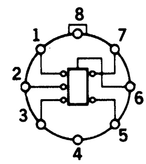
F13
914



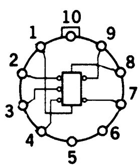
F14
915



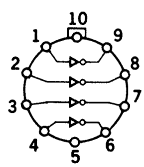
F15
923, 974



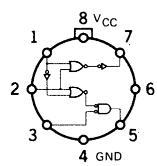
F16
926



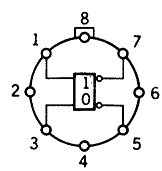
F17
927



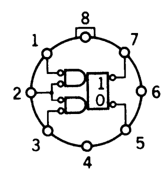
F18
901



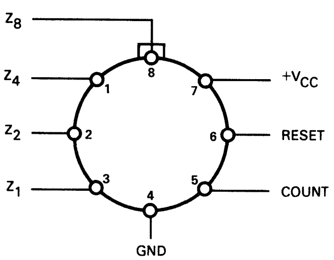
F19
902



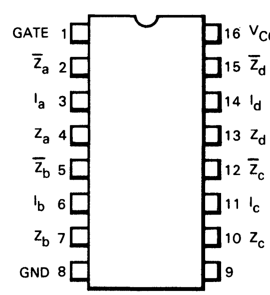
F20
906



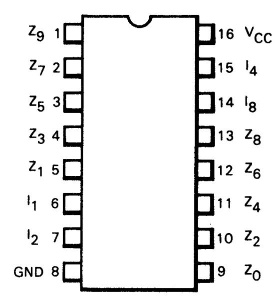
F21
958, 959



F22
959

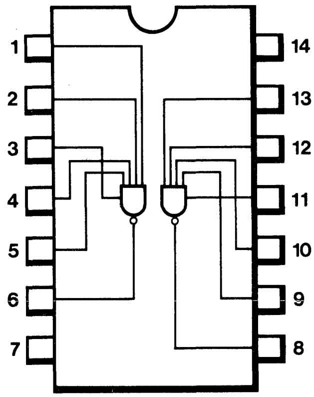


F23
960



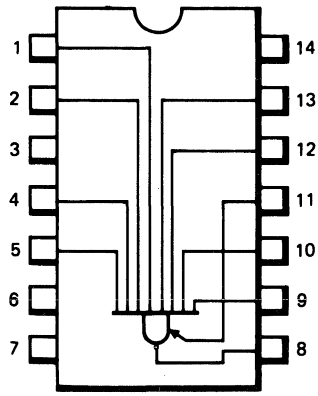
DIGITAL-DTL

G1
930, 932
944, 961
1800, 1801



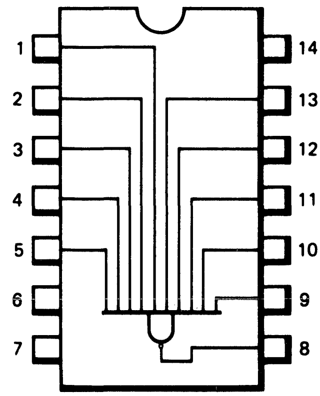
Vcc = Pin 14
GND = Pin 7

G2
1802, 1803



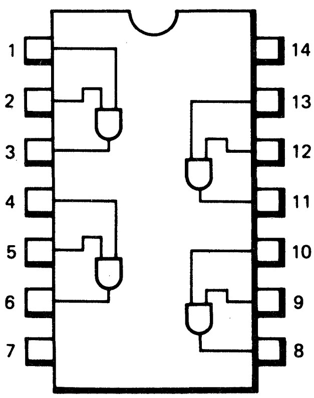
Vcc = Pin 14
GND = Pin 7

G3
1804, 1805



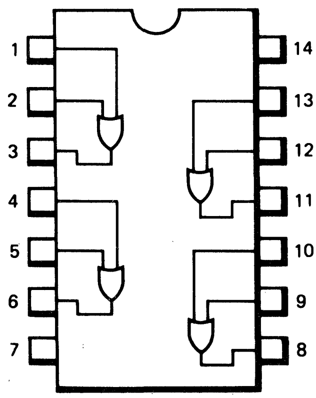
Vcc = Pin 14
GND = Pin 7

G4
1806, 1807



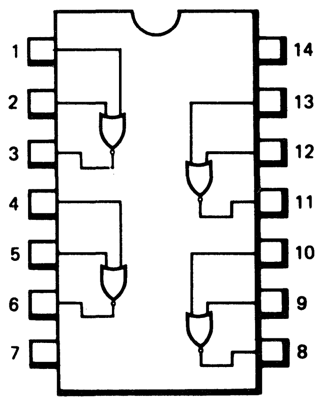
Vcc = Pin 14
GND = Pin 7

G5
1808, 1809



Vcc = Pin 14
GND = Pin 7

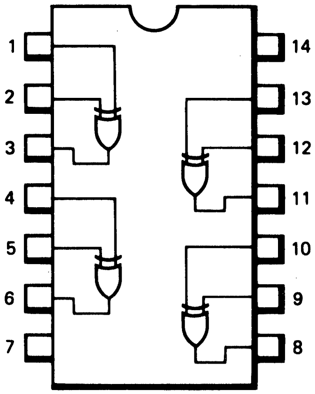
G6
1810, 1811



Vcc = Pin 14
GND = Pin 7

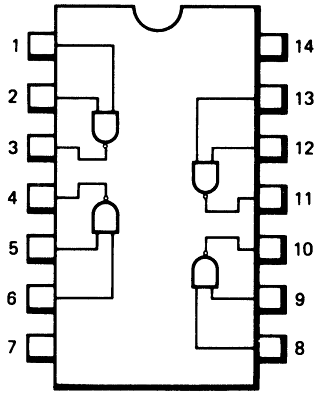
DIGITAL-DTL

G7
1812



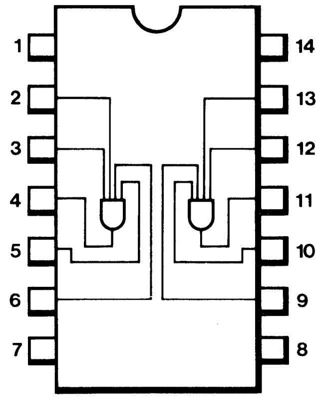
V_{CC} = Pin 14
GND = Pin 7

G8
9157, 9158



V_{CC} = Pin 14
GND = Pin 7

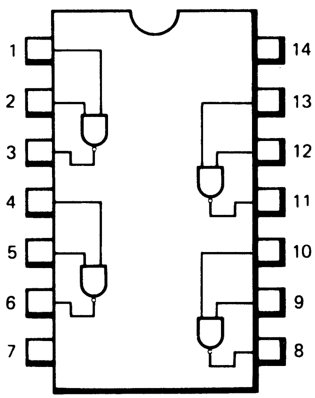
G9
933



No connection required to V_{CC} (Pin 14).

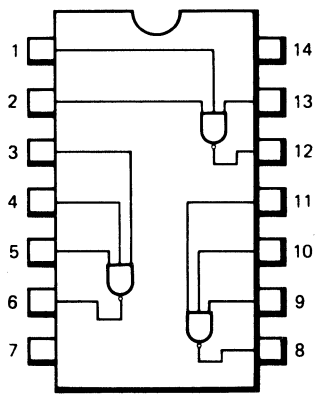
V_{CC} = Pin 14
GND = Pin 7

G10
946, 949



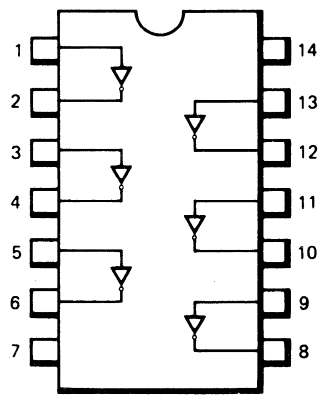
V_{CC} = Pin 14
GND = Pin 7

G11
962, 963



V_{CC} = Pin 14
GND = Pin 7

G12
9109, 9110, 9112
9135, 935, 936
937

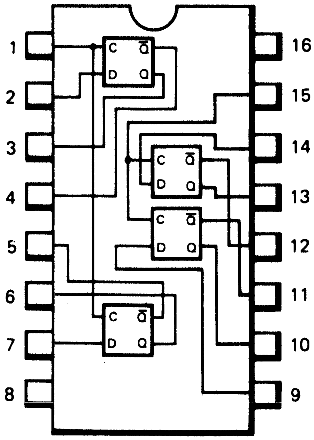


V_{CC} = Pin 14
GND = Pin 7

13

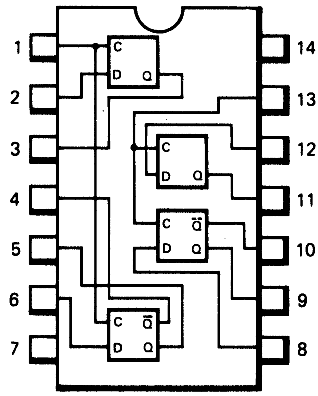
DIGITAL-DTL

G13
1813



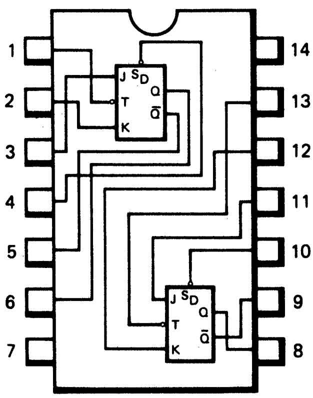
V_{CC} = Pin 16
GND = Pin 8

G14
1814



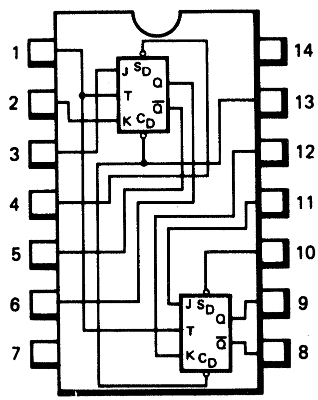
V_{CC} = Pin 14
GND = Pin 7

G15
9093, 9094



V_{CC} = Pin 14
GND = Pin 7

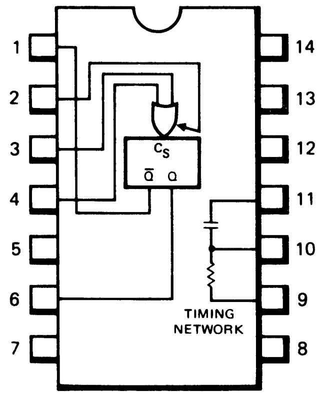
G16
9097, 9099



V_{CC} = Pin 14
GND = Pin 7

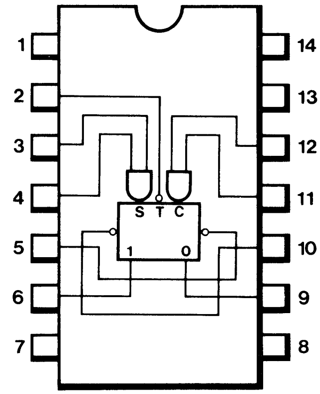
DIGITAL-DTL

G17
941, 951



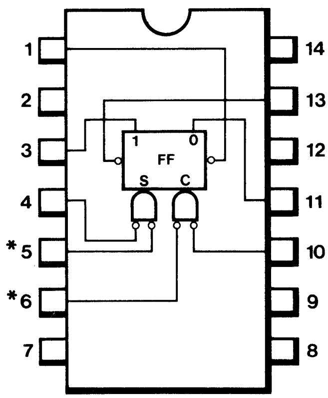
V_{CC} = Pin 14
GND = Pin 7

G18
945, 948



V_{CC} = Pin 14
GND = Pin 7

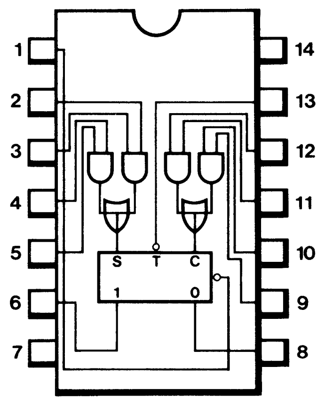
G19
950



*These inputs are capacitively coupled.

V_{CC} = Pin 14
GND = Pin 7

G20
9111

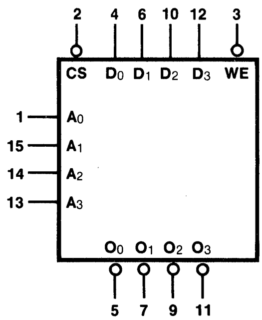


V_{CC} = Pin 14
GND = Pin 7

13

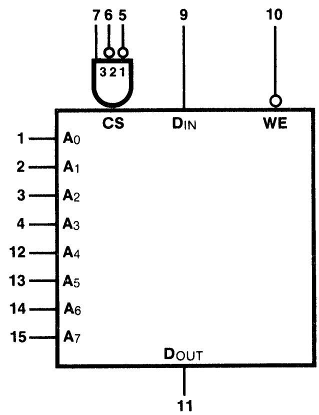
MEMORY

M1
54LS/74LS89, 54LS/74LS189, 54LS/74LS289, 7489



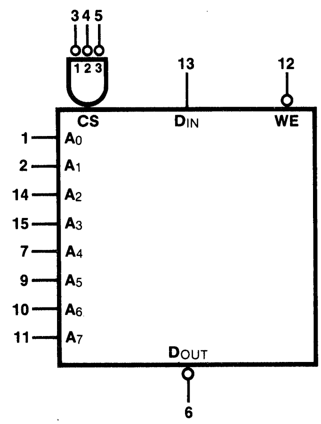
V_{CC} = Pin 16
GND = Pin 8

M2
93410, 93410A



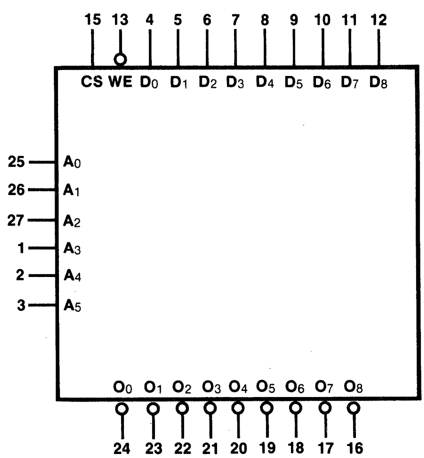
V_{CC} = Pin 16
GND = Pin 8

M3
93411, 93411A, 93L420, 93L421, 93421, 93421A



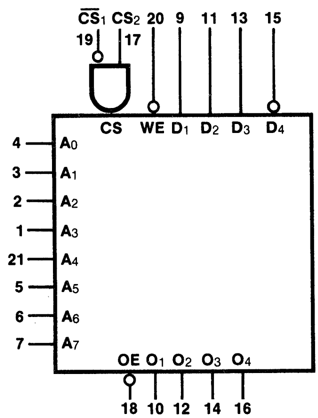
V_{CC} = Pin 16
GND = Pin 8

M4
93419



V_{CC} = Pin 28
GND = Pin 14

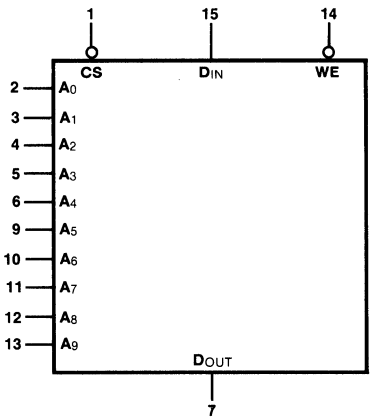
M5
93412, 93L412, 93422, 93L422



V_{CC} = Pin 22
GND = Pin 8

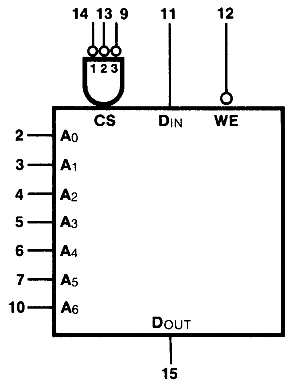
MEMORY

M6
93415, 93L415, 93415A,
93425, 93L425, 93425A



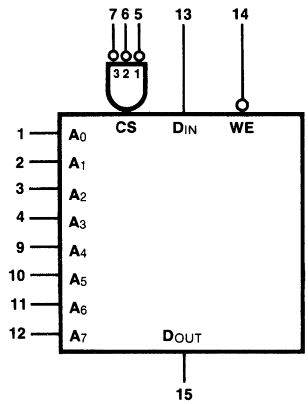
VCC = Pin 16
GND = Pin 8

M7
10405



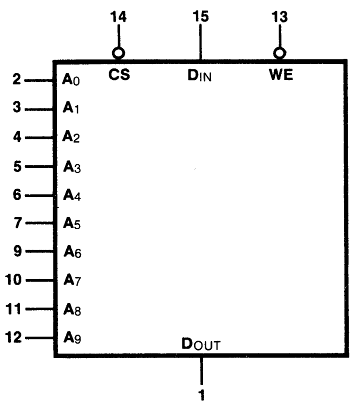
VCC = GND = Pins 1 and 16
VEE = Pin 8

M8
10410, 10411, 10414
100414



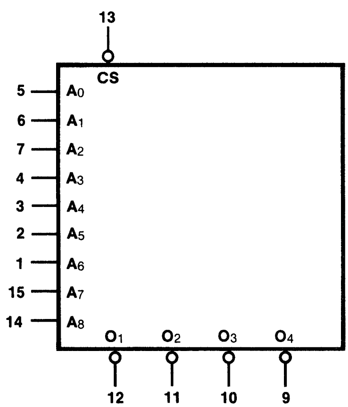
VCC = Pin 16
VEE = Pin 8

M9
10415, 10415A, 100415



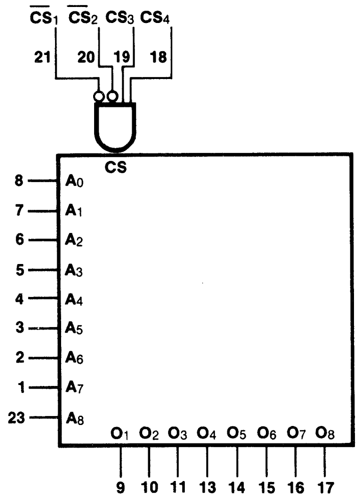
VCC = Pin 16
VEE = Pin 8

M10
93431, 93441
93436, 93446



VCC = Pin 16
VEE = Pin 8

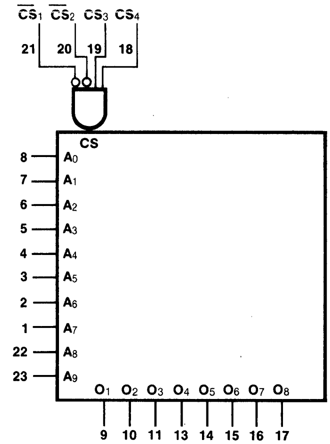
M11
93432, 93442
93438, 93448



VCC = Pin 24
GND = Pin 12

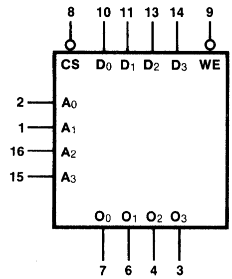
MEMORY

M12
93454, 93464



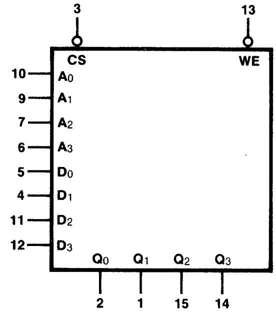
V_{CC} = Pin 24
GND = Pin 12

M13
95400



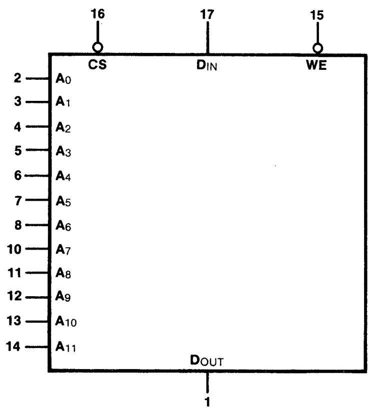
V_{CC} = GND = Pin 5
V_{EE} = Pin 12

M14
10145A



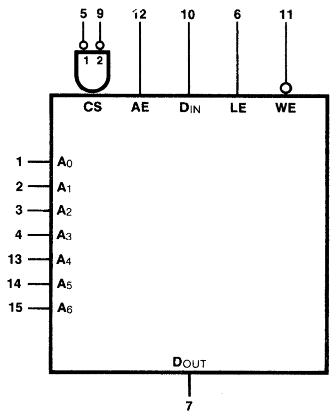
V_{CC} = Pin 16
GND = Pin 8

M15
10470, 93470, 93471



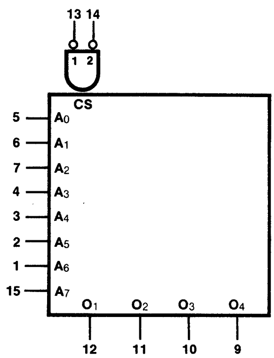
V_{CC} = Pin 18
V_{EE} = Pin 9

M16
93481, 93481A



V_{CC} = Pin 16
GND = Pin 8

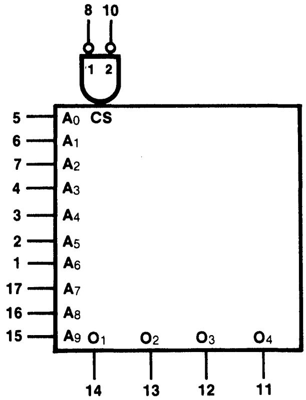
M17
93417, 93427, 93457
93467



V_{CC} = Pin 16
GND = Pin 8

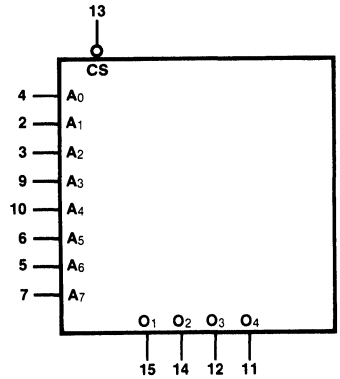
MEMORY

M18
93452, 93453



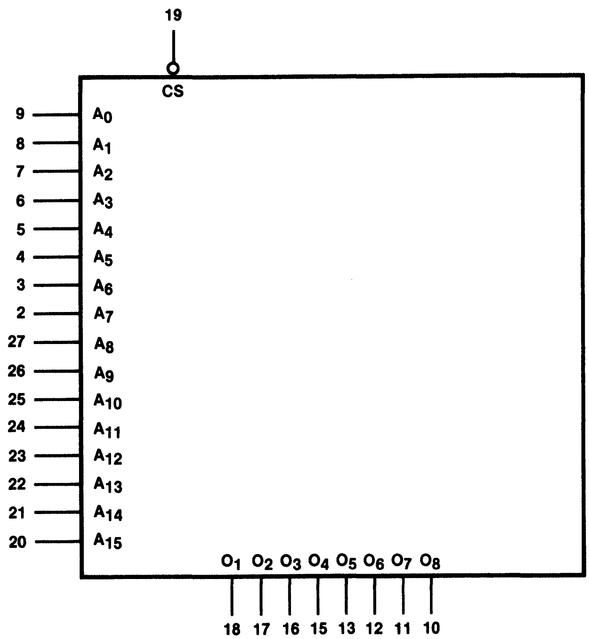
V_{CC} = Pin 18
GND = Pin 9

M19
10416, 100416



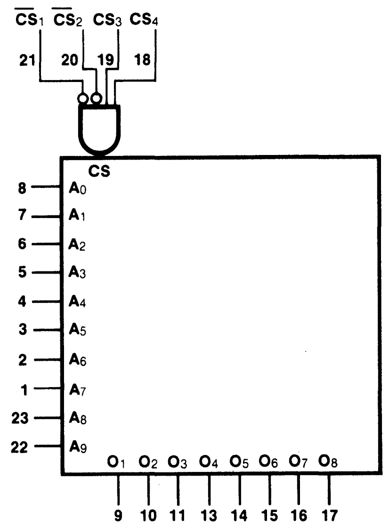
V_{CP} = GND (Read Only) = Pin 1
V_{CP} = +12 V (Programming Only) = Pin 1
V_{CC} = GND = Pin 16
V_{EE} = Pin 8

M20
93458, 93459



V_{CC} = Pin 28
GND = Pin 14
V_P = Pin 1

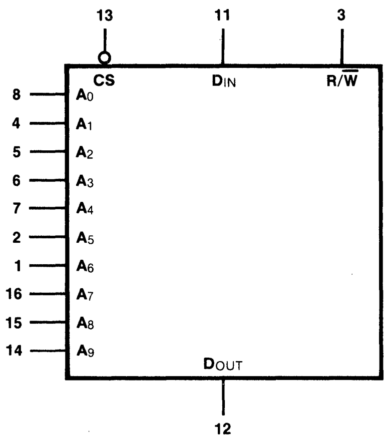
M21
93450, 93451



V_{CC} = Pin 24
GND = Pin 12

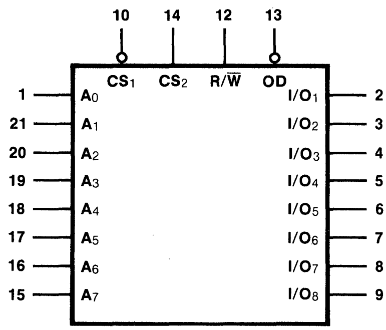
MEMORY

M22
2102, 2102L,
21L02, 3542



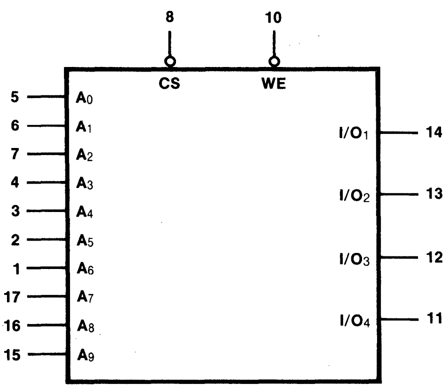
V_{SS} = Pin 9
V_{DD} = Pin 10

M23
3539



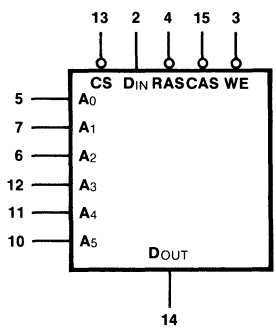
V_{DD} = Pin 22
V_{SS} = Pin 11

M24
F2114



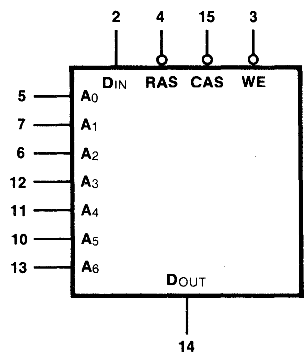
V_{CC} = Pin 18
GND = Pin 9

M25
M4027



V_{SS} = Pin 16
V_{CC} = Pin 9
V_{DD} = Pin 8
V_{BB} = Pin 1

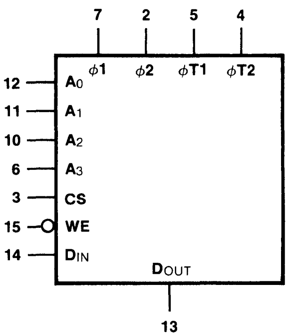
M26
F16K



V_{SS} = Pin 16
V_{CC} = Pin 9
V_{DD} = Pin 8
V_{BB} = Pin 1

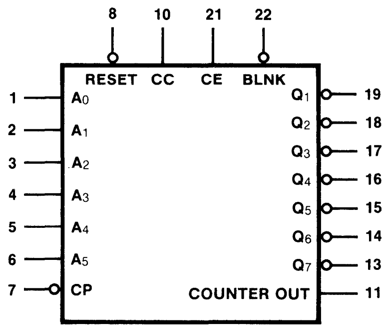
MEMORY

M27
F464



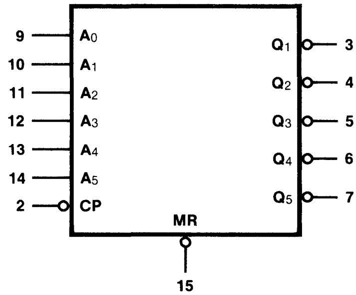
V_{DD} = Pin 1
V_{CC} = Pin 16
V_{SS} = Pin 8
V_{BB} = Pin 9

M28
3257



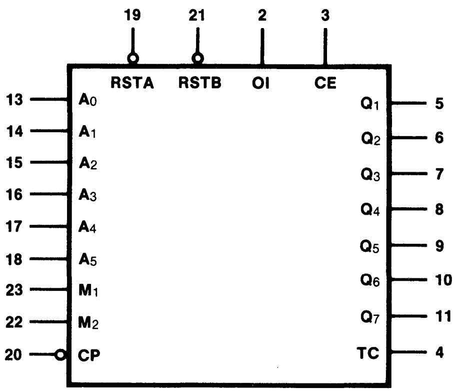
V_{SS} = Pin 24
V_{GG} = Pin 23
V_{DD} = Pin 12

M29
3258



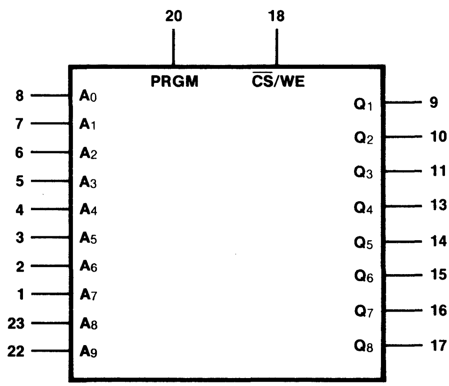
V_{SS} = Pin 16
V_{DD} = Pin 8
V_{GG} = Pin 1

M30
3260



V_{SS} = Pin 24
V_{GG} = Pin 1
V_{DD} = Pin 12

M31
F2708

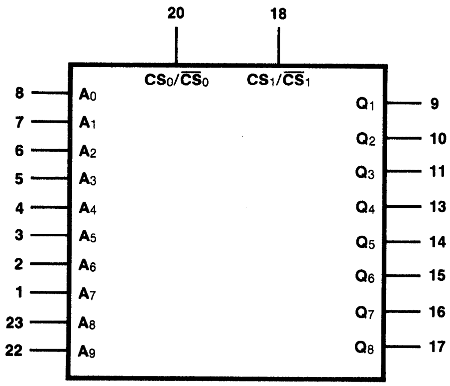


V_{DD} = Pin 19
V_{SS} = Pin 12
V_{CC} = Pin 24
V_{BB} = Pin 21

13

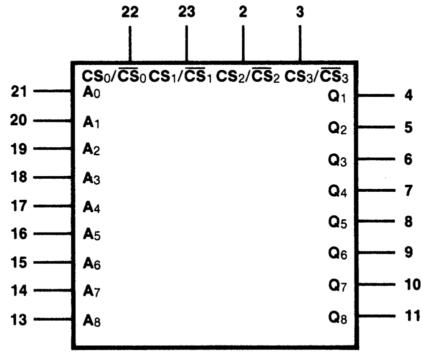
MEMORY

M32
F3508



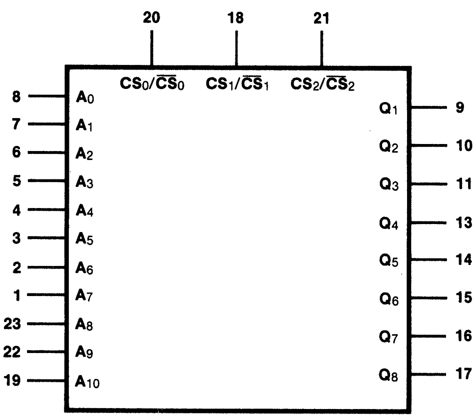
V_{CC} = Pin 24
V_{SS} = Pin 12

M33
3514, 3515



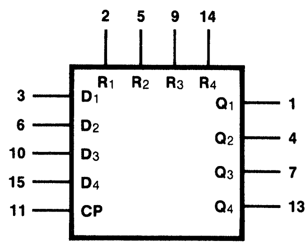
V_{SS} = Pin 24
V_{DD} = Pin 12
V_{GG} = Pin 1

M34
F3516E



V_{CC} = Pin 24
V_{SS} = Pin 12

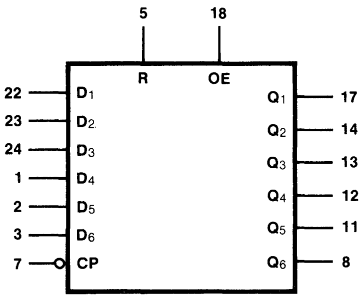
M35
3342, 3347, 3357



V_{SS} = Pin 16
V_{DD} = Pin 8
V_{GG} = Pin 12

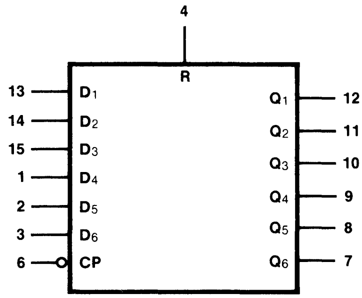
MEMORY

M36
3348



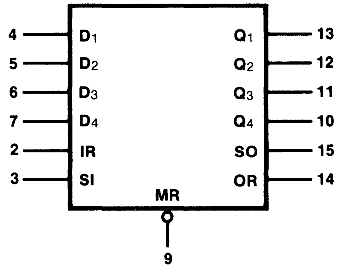
V_{SS} = Pin 20
V_{GG} = Pin 6

M37
3349



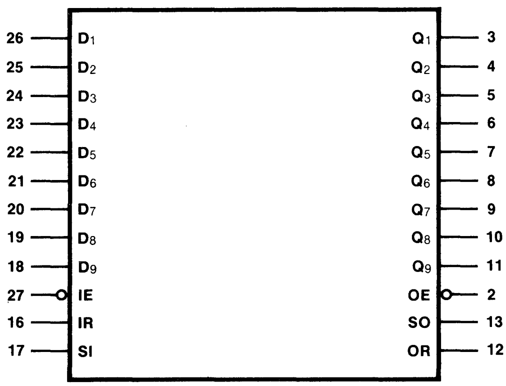
V_{CC} = Pin 16
V_{GG} = Pin 5

M38
3341



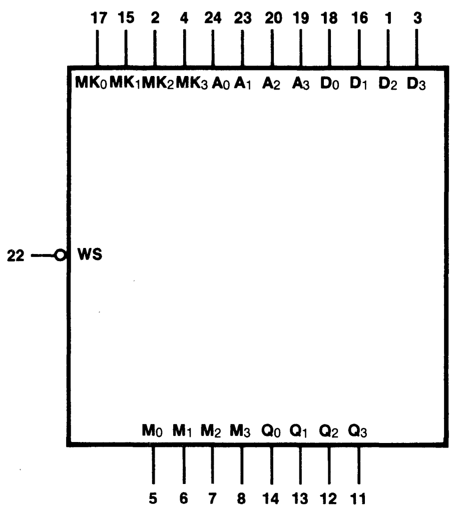
V_{SS} = Pin 16
V_{DD} = Pin 8
V_{GG} = Pin 1

M39
3351



V_{SS} = Pin 28
V_{DD} = Pin 14
V_{GG} = Pin 1

M40
100142

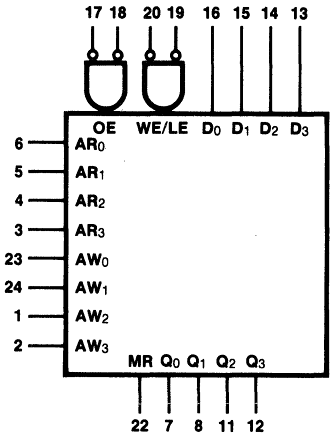


V_{CC} = Pin 9
V_{CCA} = Pin 10
V_{EE} = Pin 21

13

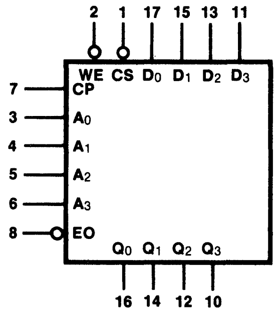
MEMORY

M41
100145A



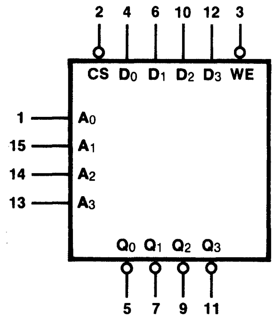
V_{CC} = Pin 9
V_{CCA} = Pin 10
V_{EE} = Pin 21

M42
4710B



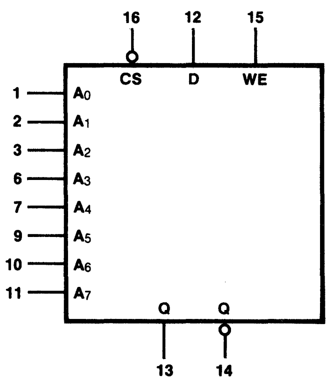
V_{DD} = Pin 18
V_{SS} = Pin 9

M43
4725B



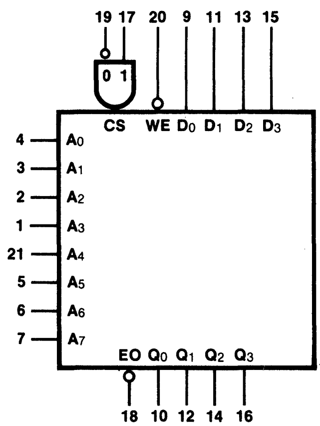
V_{DD} = Pin 16
V_{SS} = Pin 8

M44
4720B



V_{DD} = Pin 5
V_{SS} = Pin 8
N_C = Pin 4

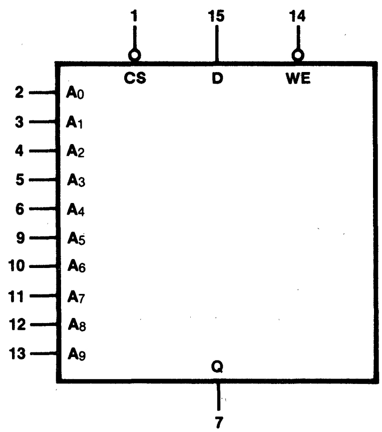
M45
4721B



Flatpak pinout not shown.

V_{DD} = Pin 22
V_{SS} = Pin 8

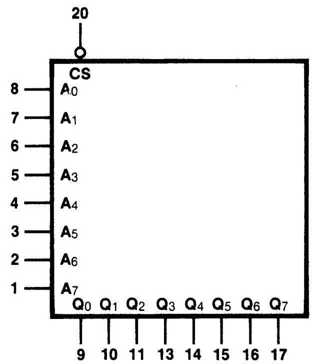
M46
4736B



V_{DD} = Pin 16
V_{SS} = Pin 8

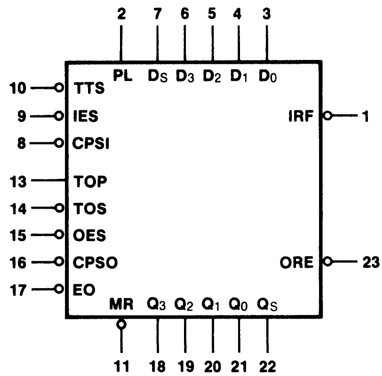
MEMORY

M47
4735B



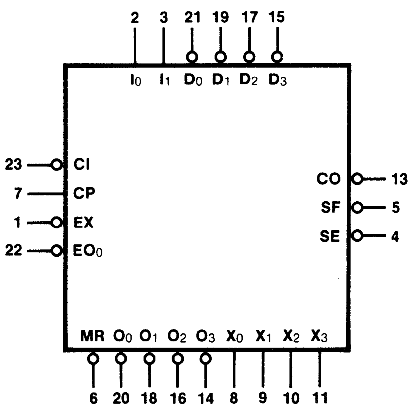
V_{DD} = Pin 24
V_{SS} = Pin 12
NC = Pins 18, 19, 21, 22, 23

M48
4703B



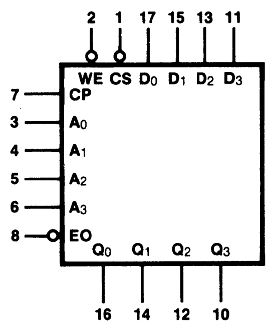
V_{DD} = Pin 24
V_{SS} = Pin 12

M49
4706B



V_{DD} = Pin 24
V_{SS} = Pin 12

M50
9410

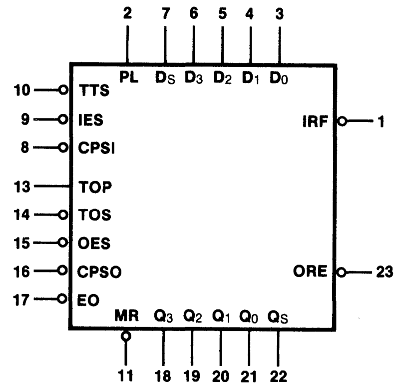


V_{CC} = Pin 18
GND = Pin 9

13

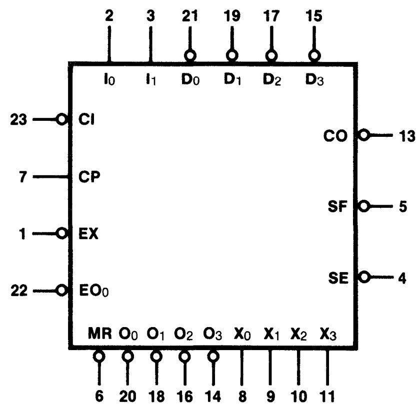
MEMORY

M51
9403



V_{CC} = Pin 24
GND = Pin 12

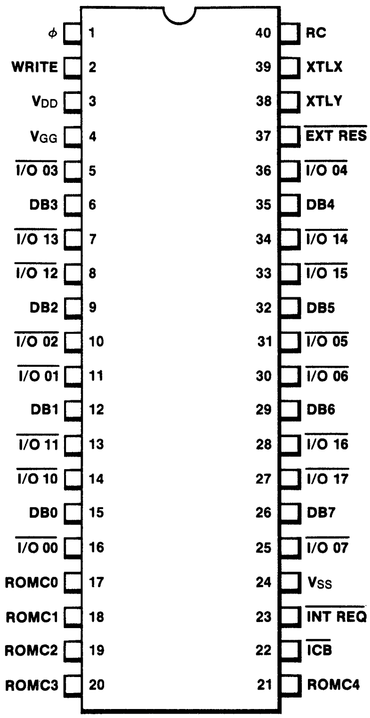
M52
9406



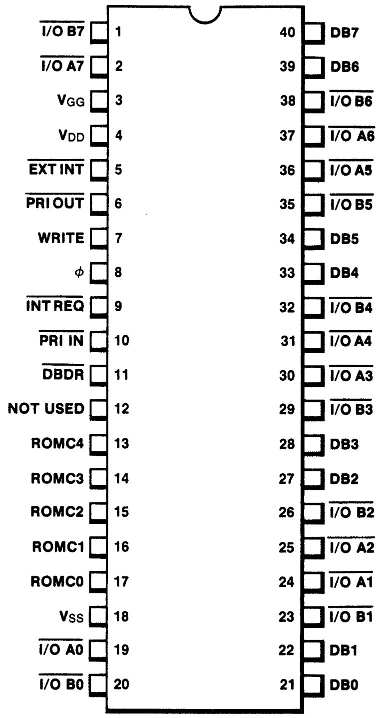
V_{CC} = Pin 24
GND = Pin 12

MICROCOMPUTERS

P1
F3850



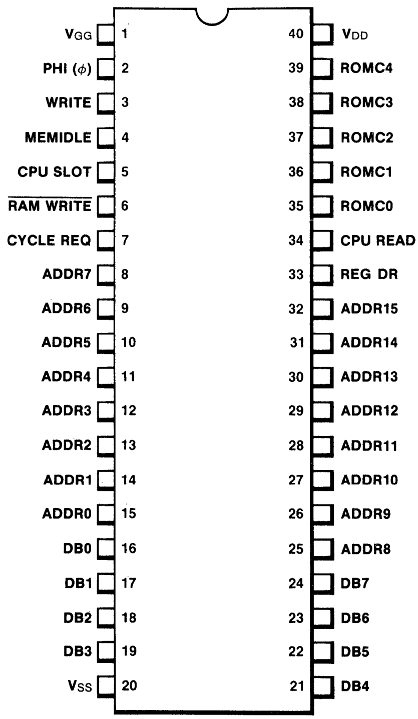
P2
F3851
F3861



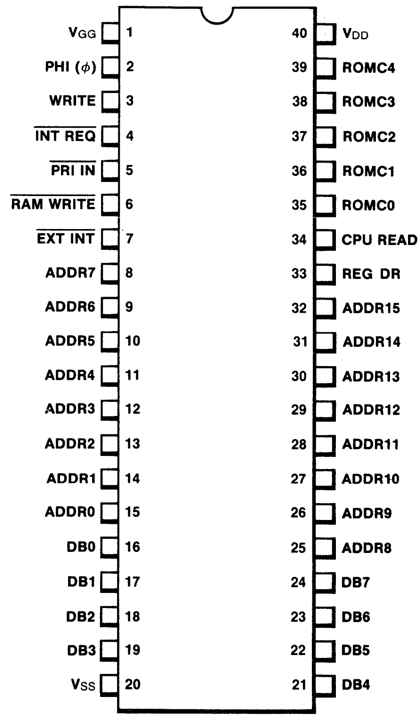
13

MICROCOMPUTERS

P3
F3852

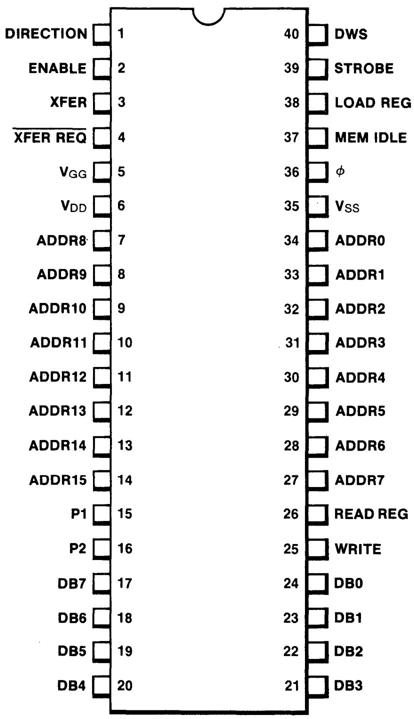


P4
F3853

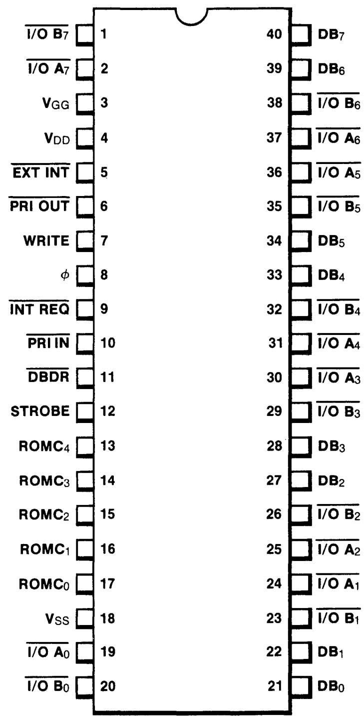


MICROCOMPUTERS

P5
F3854



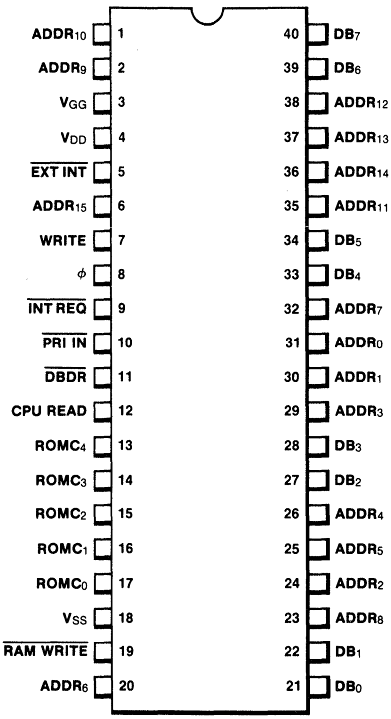
P6
F3856
F3871



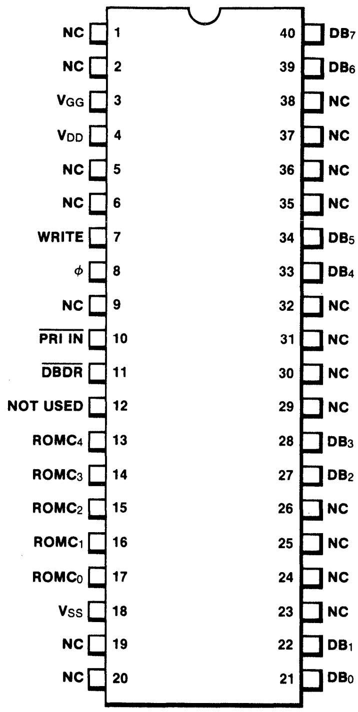
13

MICROCOMPUTERS

P7
F3857

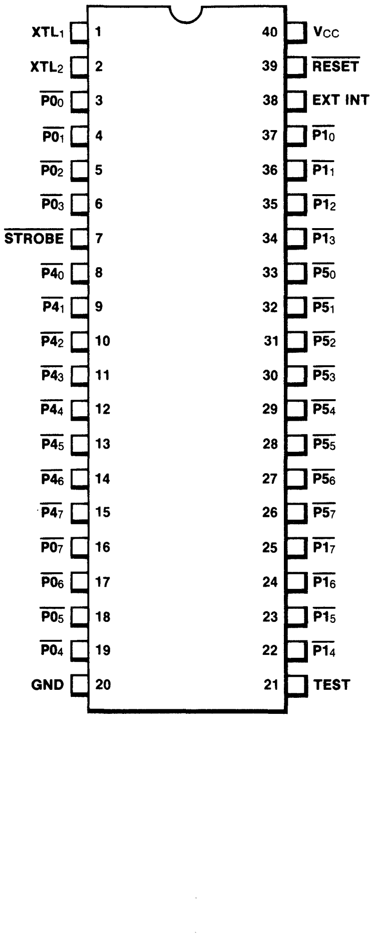


P8
F3899

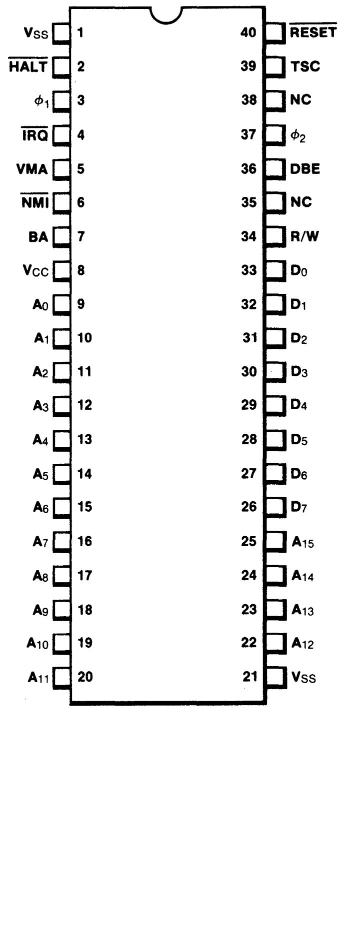


MICROCOMPUTERS

P9
F3870



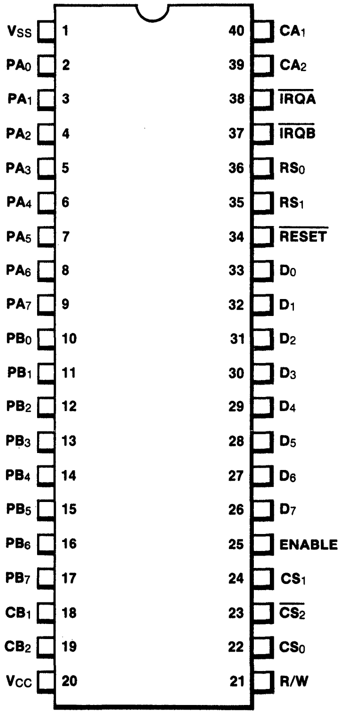
P10
F6800
F68A00
F68B00



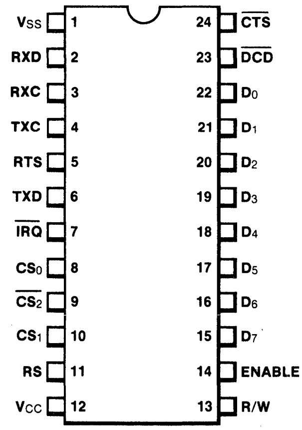
13

MICROCOMPUTERS

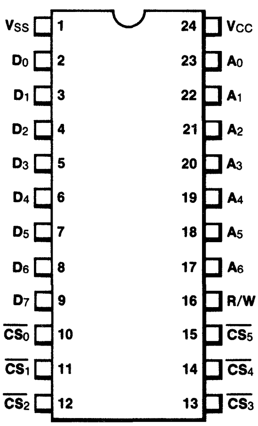
P11
F6820/21
F68A21
F68B21



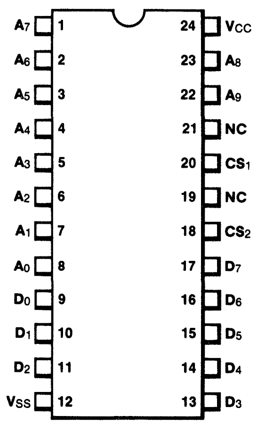
P12
F6850
F68A50
F68B50



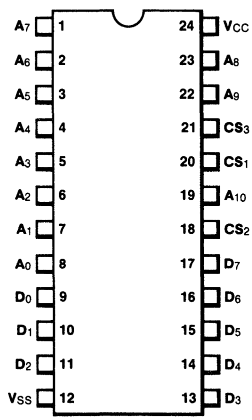
P13
F6810
F68A10
F68B10



P14
F68308
F68A308

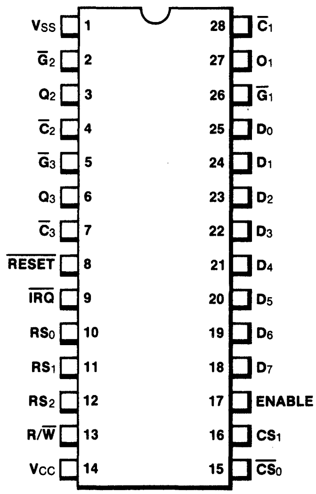


P15
F68316
F68A316
F68B316

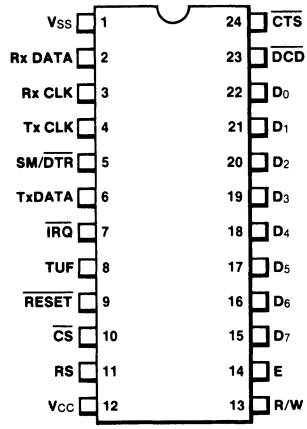


MICROCOMPUTERS

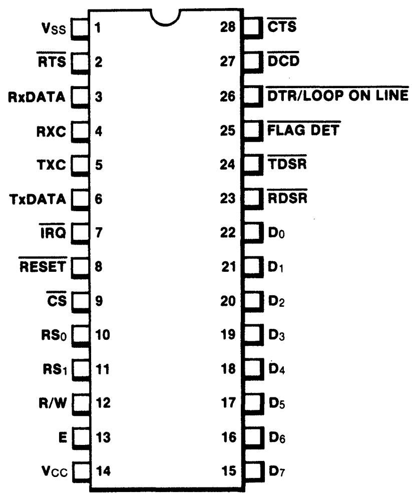
P16
F6840
F68A40



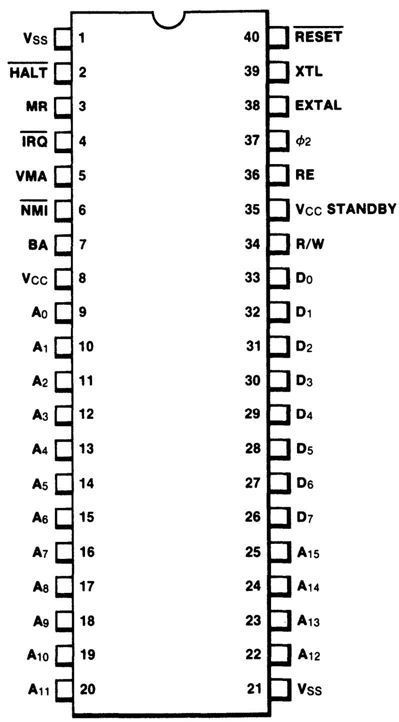
P17
F6852
F68A52
F68B52



P18
F6854
F68A54



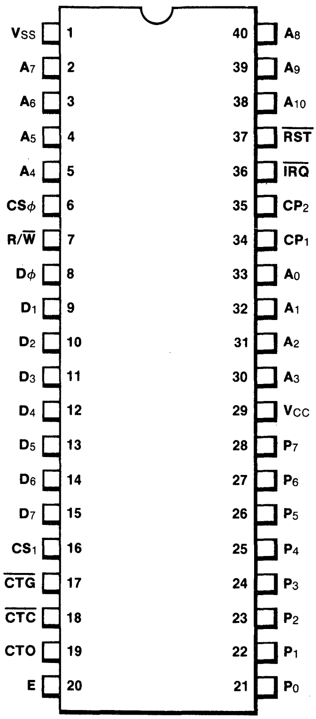
P19
F6802
F68A02
F68B02



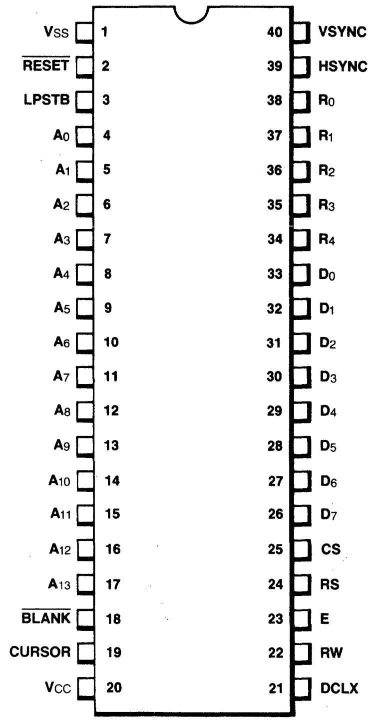
13

MICROCOMPUTERS

P20
F6846
F68A46

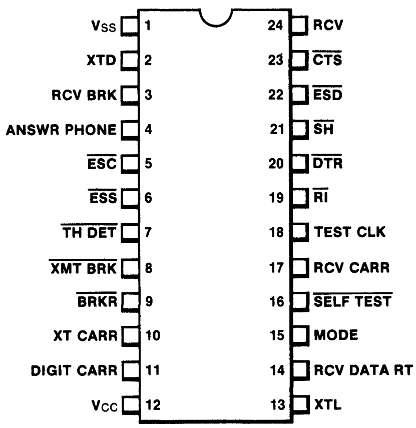


P22
F6840

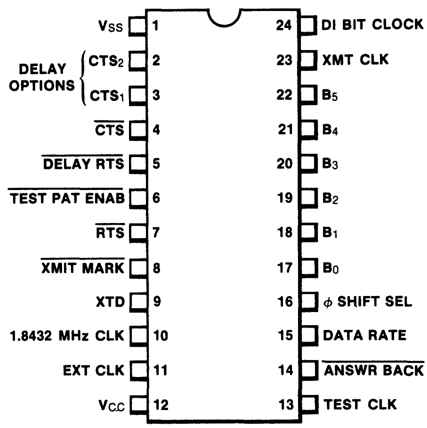


MICROCOMPUTERS

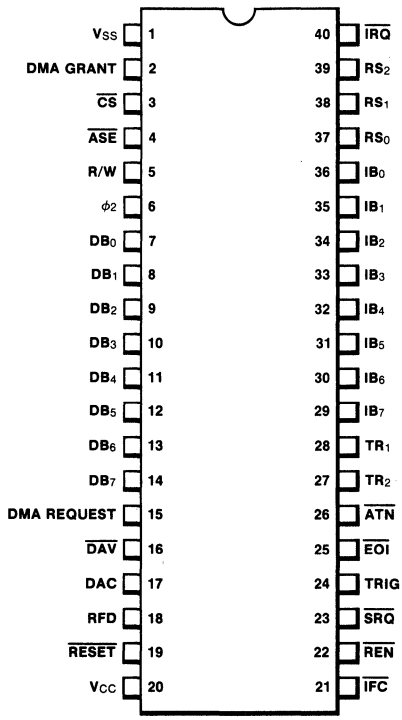
P23
F6860



P24
F6862



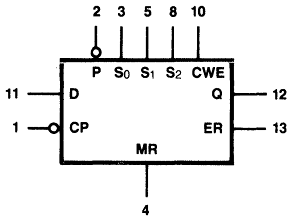
P25
F68488



13

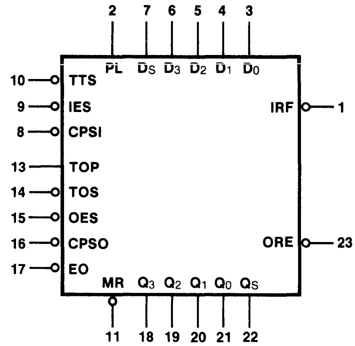
MICROCOMPUTERS

P26
9401



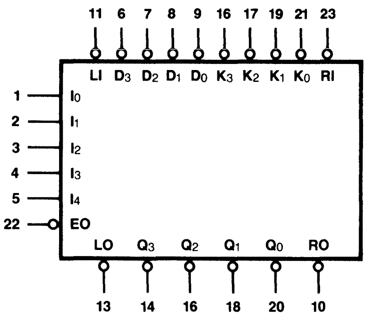
V_{CC} = Pin 14
GND = Pin 7

P27
9403/9423



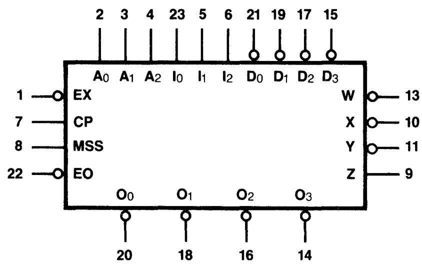
V_{CC} = Pin 24
GND = Pin 12

P28
9404



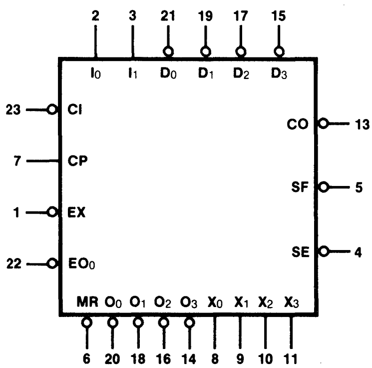
V_{CC} = Pin 24
GND = Pin 12

P29
9405A



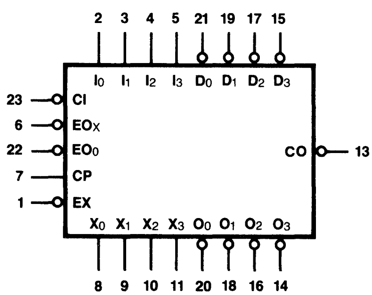
V_{DD} = Pin 24
V_{SS} = Pin 12

P30
9406



V_{DD} = Pin 24
V_{SS} = Pin 12

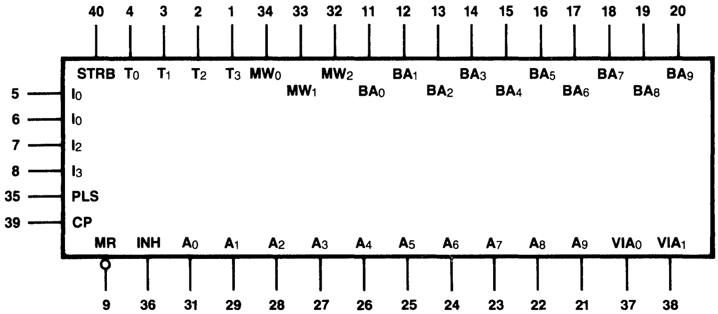
P31
9407



V_{DD} = Pin 24
V_{SS} = Pin 12

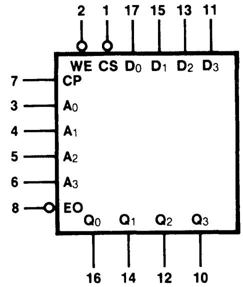
MICROCOMPUTERS

P32
9408/9408A



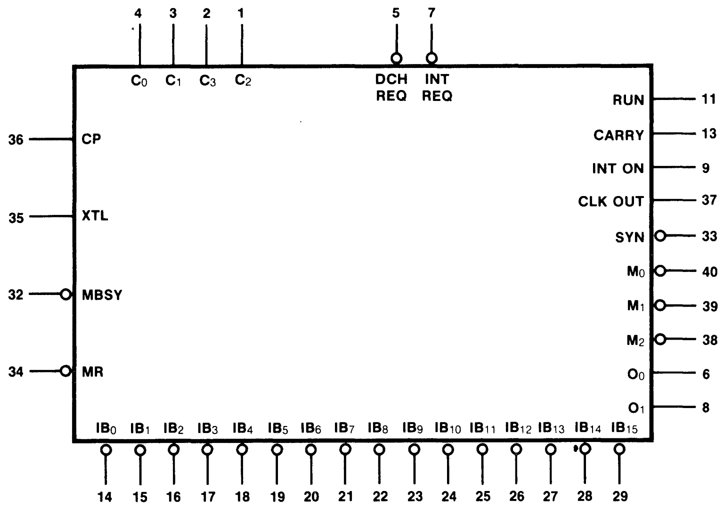
V_{DD} = Pin 10
V_{SS} = Pin 30

P33
9410



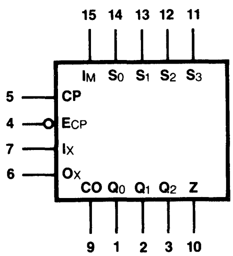
V_{DD} = Pin 18
V_{SS} = Pin 9

P34
9440



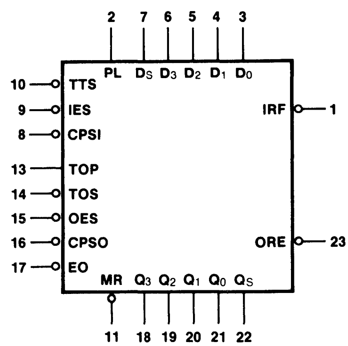
V_{CC} = PIN 31
I_{INJ} = PIN 12
GND = PIN 10
GND = PIN 30

P35
4702B



V_{DD} = Pin 16
V_{SS} = Pin 8

P36
4703B

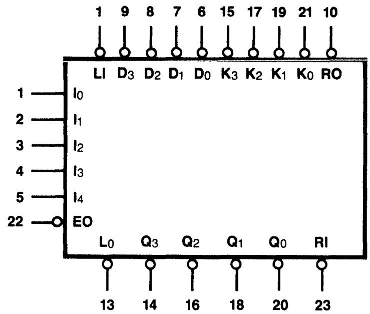


V_{DD} = Pin 24
V_{SS} = Pin 12

13

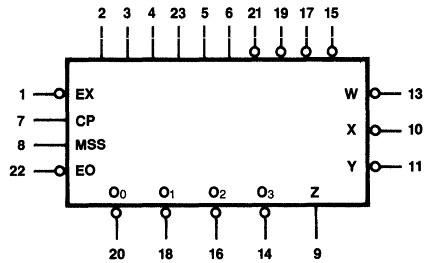
MICROCOMPUTERS

P37
4704B



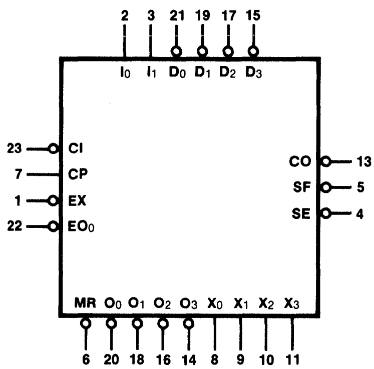
V_{DD} = Pin 24
V_{SS} = Pin 12

P38
4705B



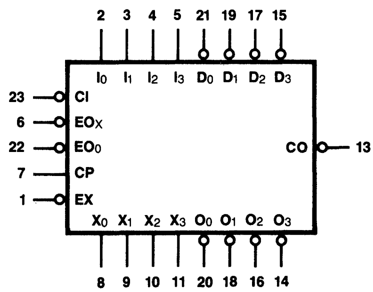
V_{DD} = Pin 24
V_{SS} = Pin 12

P39
4706B



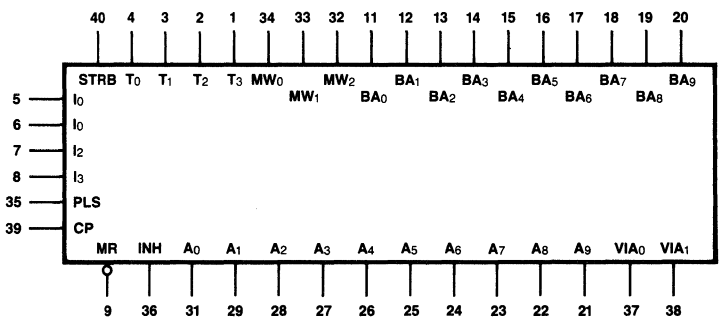
V_{DD} = Pin 24
V_{SS} = Pin 12

P40
4707B



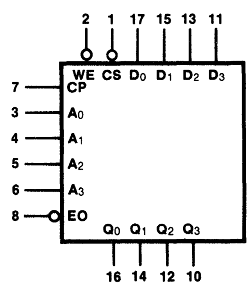
V_{DD} = Pin 24
V_{SS} = Pin 12

P41
4708B

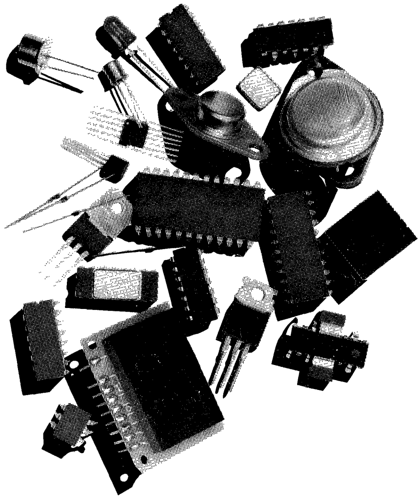


V_{DD} = Pin 10
V_{SS} = Pin 30

P42
4710B



V_{DD} = Pin 18
V_{SS} = Pin 9



ORDERING INFORMATION

DISCRETE PRODUCTS
Fairchild discrete products may be ordered by the Device Number listed in either the Product Index (Section 1) or the selection guides (Sections 2 through 4).

INTEGRATED CIRCUITS
Specific ordering codes are given in the Product Index in Section 1. The selection guides given in Section 5 through 11 list only "basic" Device Numbers. This basic number is used to form part of a simplified purchasing code where the package style and temperature range are defined as follows:

XXXX D C

- C — Temperature Range Code
- D — Package Code
- XXXX — Device Number (basic)

Coding will differ on second-source devices. If questions arise on the proper ordering code on any Fairchild device, check with your local Fairchild Salesperson or Representative before ordering.

Temperature Range
Four basic temperature grades are in common use:

C = Commercial
0° C to +70/75° C (exc. CMOS)
-40° C to +85° C (CMOS)

V = Vehicular
-40° C to +85° C

L = Limited Military
-20° C to +85° C (LIC)
-55° C to +85° C (MOS)

M = Military
-55° C to +125° C

ORDERING INFORMATION (Cont'd)

Package Code
One letter represents the basic package style. Different package outlines exist within each package style to accommodate varying die sizes and number of leads.

D — Ceramic/Hermetic Dual In-line
QA, QB, TO-116, 6A, 6B, 6D, 6E, 6F, 6I, 6J, 6M, 6N, 6Q, 6Z, 7A, 7B, 7D, 7F, 7H, 7I, 7L, 7M, 7R, 7Y, 8E, 8F, 8I, 8R, 8T

E — Epoxy Cylindrical
TO-105, TO-106

F — Flatpak
TO-86, TO-91, 3D, 3F, 3I, 3M, 4B, 4L, 4M, 4Q, 4R, 8U

H — Metal Can (TO-5 type)
TO-5, TO-18, TO-33, TO-39, TO-52, TO-71, TO-72, TO-78, TO-96, TO-99, TO-100, TO-101, 5B, 5E, 5F, 5G, 5S, 5U

J — Metal Power Package
TO-66

K — Metal Power Package
TO-3

P — Plastic Dual In-line
TO-116, 4K, 6V, 8K, 8P, 9A, 9B, 9C, 9H, 9J, 9M, 9N, 9U, 9Y, 9Z

R — Ceramic Mini-DIP
6T

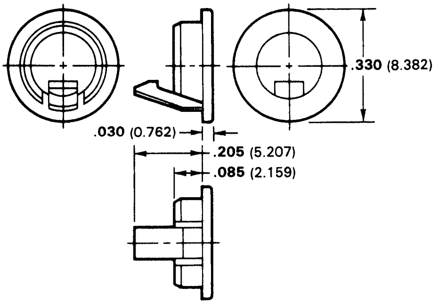
T — Plastic Mini-DIP
9T, 9V (T1), 9V (T2), 9V (T3), 9W (P3), 9W (P4), 9W (P5), 9W (P6)

H — Plastic Power Package
TO-220

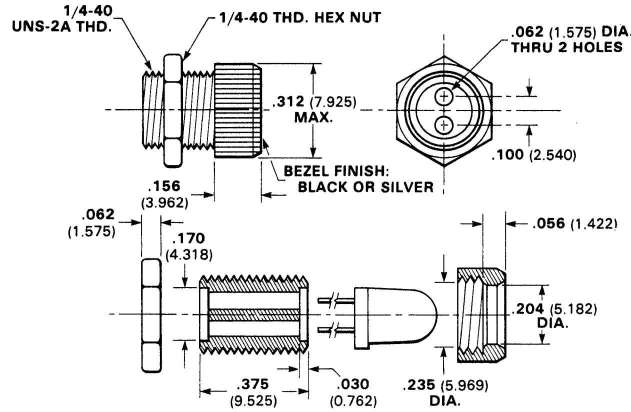
U1 — Power Watt, Dynawatt
TO-220, 8Y, 8Z

W — Epoxy
TO-92

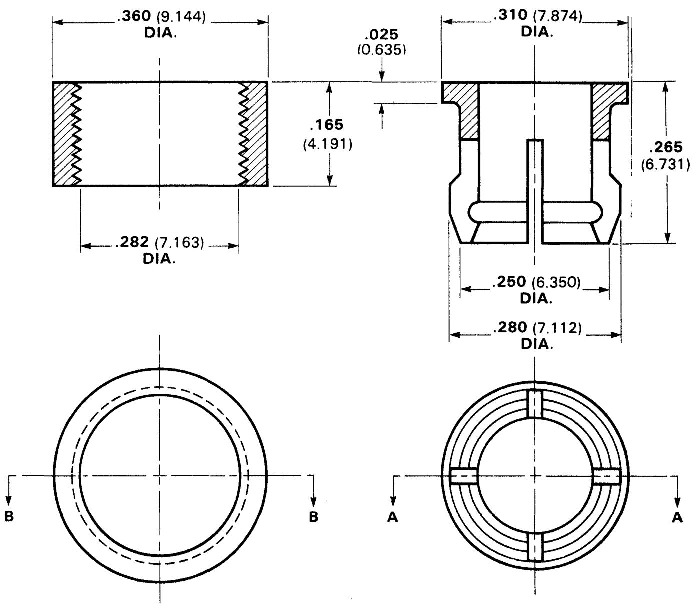
Opto - 1



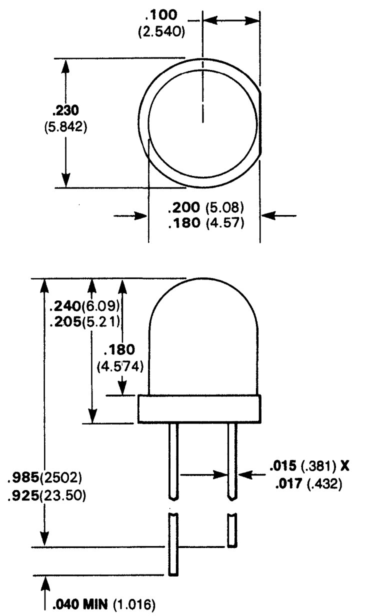
Opto - 2



Opto - 3



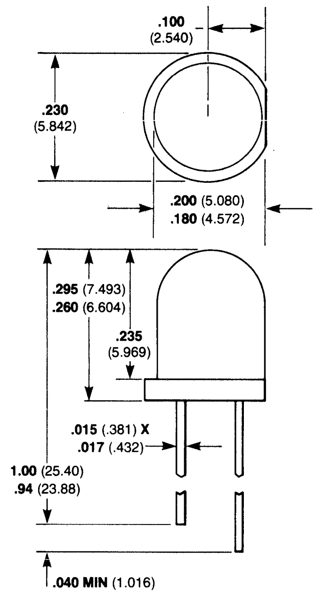
Opto - 4



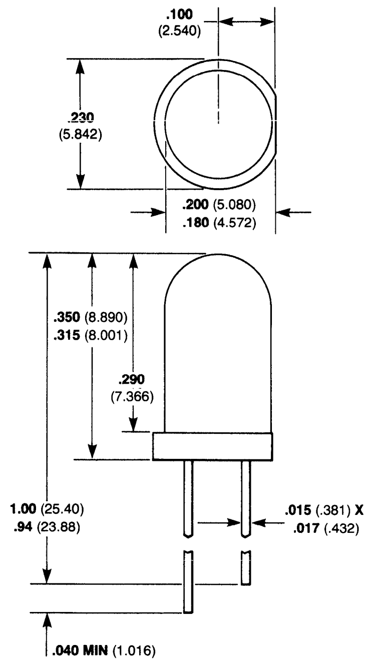
NOTE:
Tolerance unless specified = ±.015 (±.381)

All dimensions in inches (bold) and millimeters (parentheses)

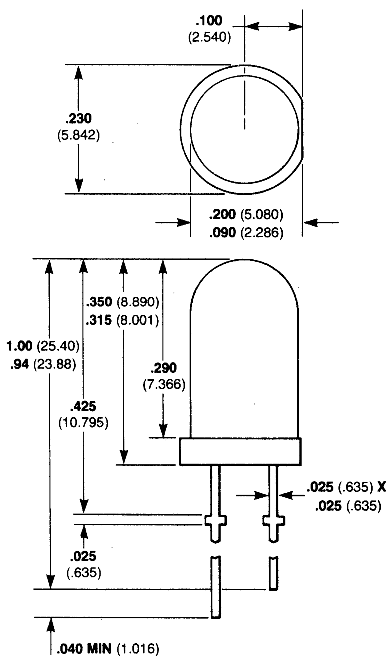
Opto - 5



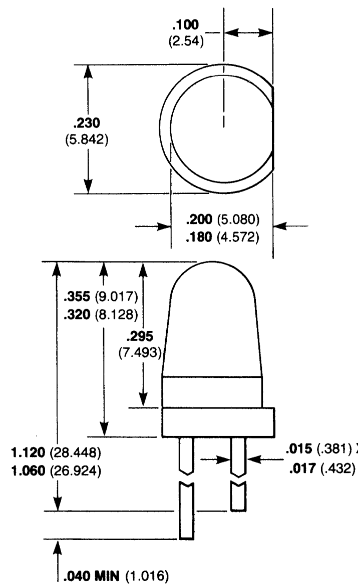
Opto - 6



Opto - 7

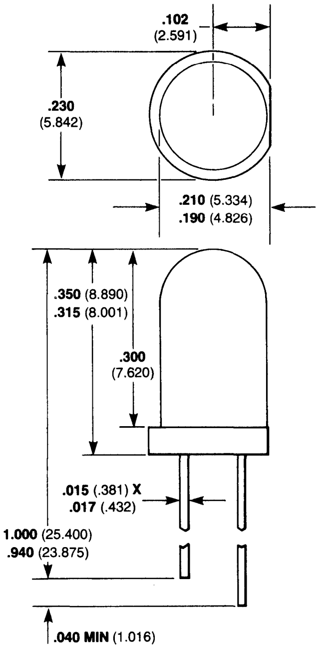


Opto - 8

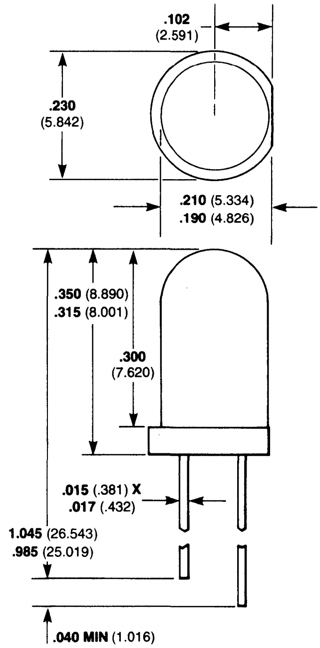


All dimensions in inches (bold) and millimeters (parentheses)
Tolerance unless specified = ±.015 (±.381)

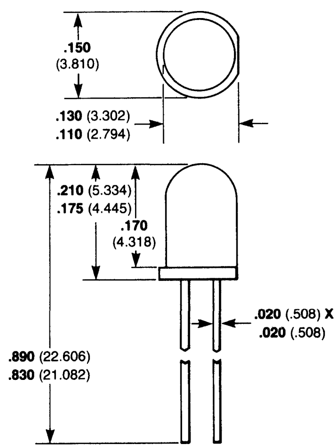
Opto - 9



Opto - 10



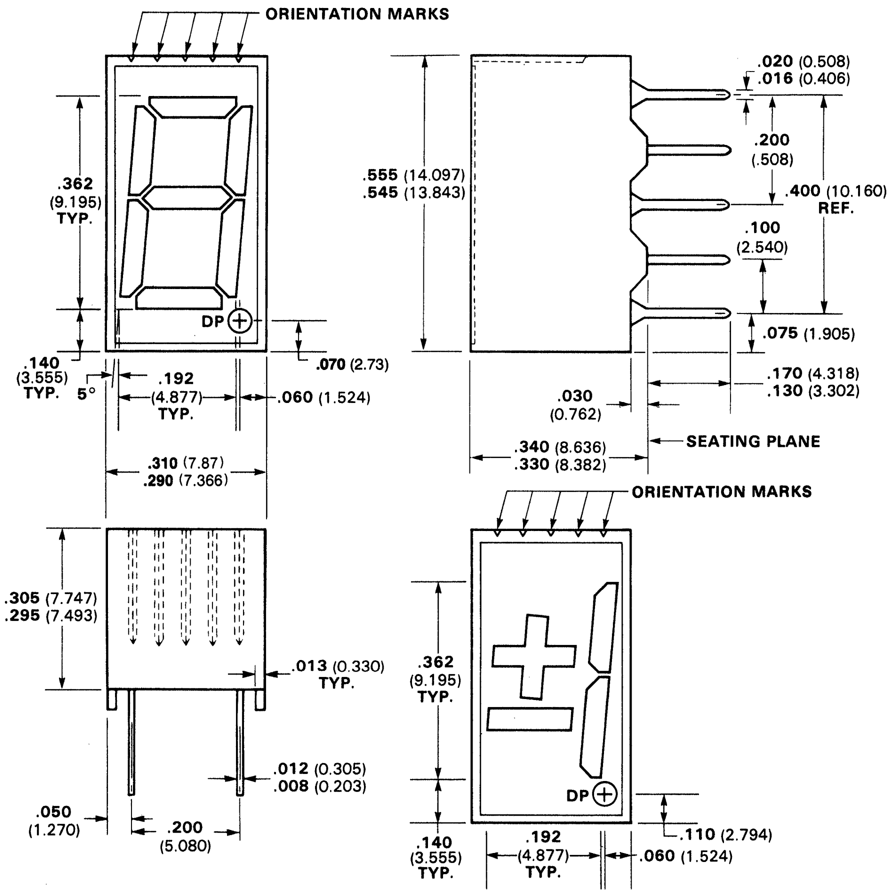
Opto - 11



All dimensions in inches (bold) and millimeters (parentheses)
Tolerance unless specified = ±.015 (±.381)

14

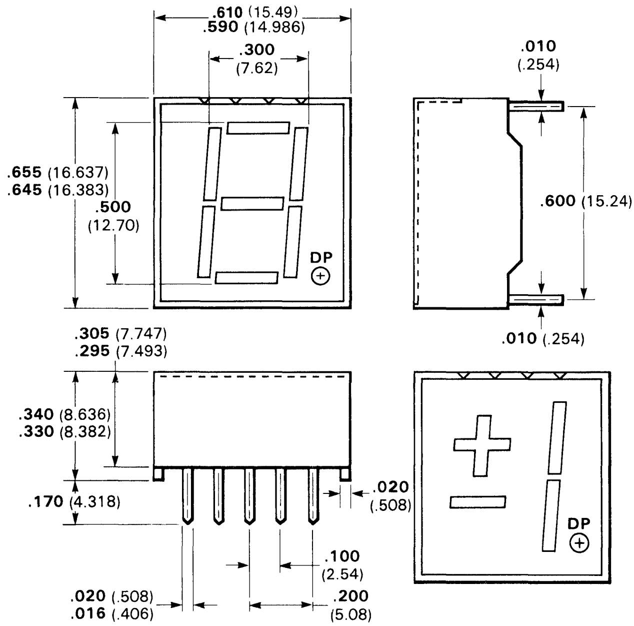
Opto - 12



NOTES:
For polarity indication the top surface is ribbed.
The unit LED segments cannot necessarily be seen through the lens cap.
Lens cap color is red for red LED.
Pins 1 and 6 are common.
All dimensions are ±.015 inch.

All dimensions in inches (bold) and millimeters (parentheses)

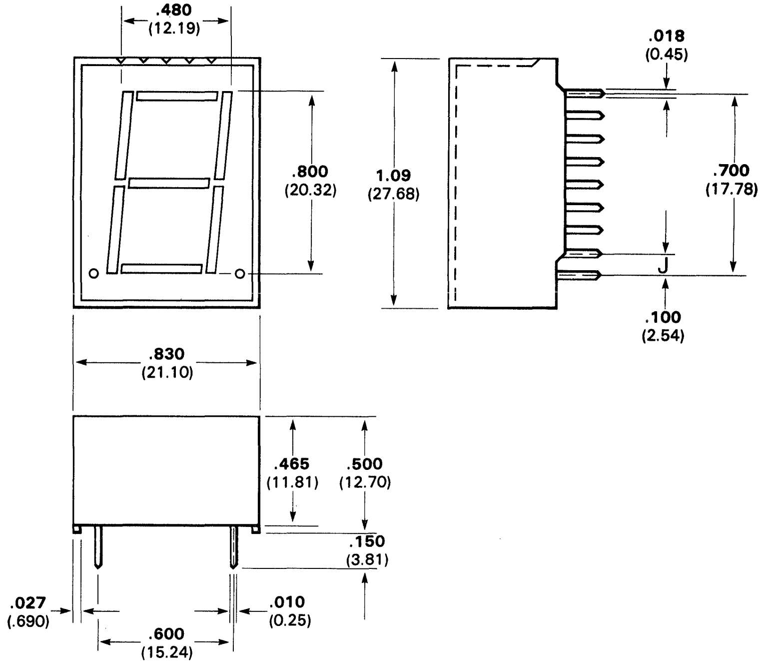
Opto - 13



NOTES:
For polarity indication the surface is ribbed.
The unlit LED segments cannot necessarily be seen through the lens cap.
Lens cap color is red for red LED
Pins 3 and 8 are common
All dimensions are ±.015 inch

All dimensions in inches (bold) and millimeters (parentheses)

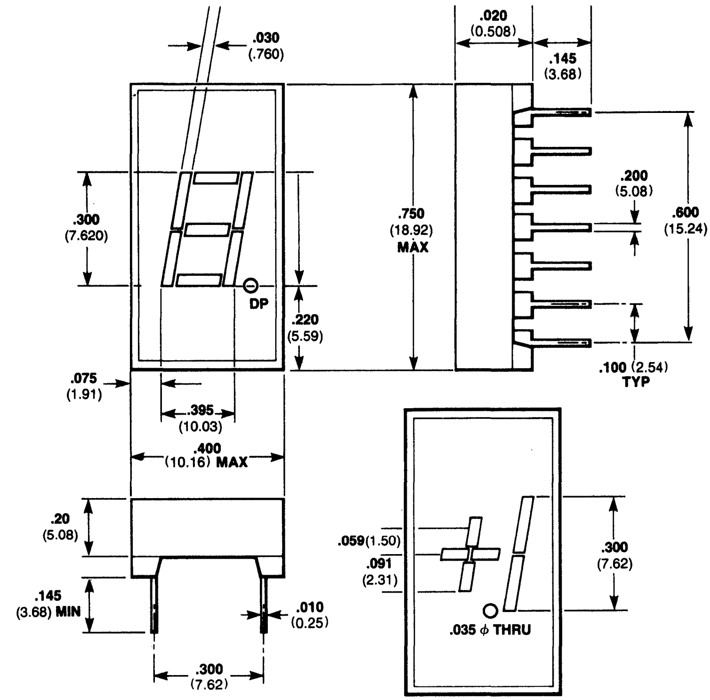
Opto - 14



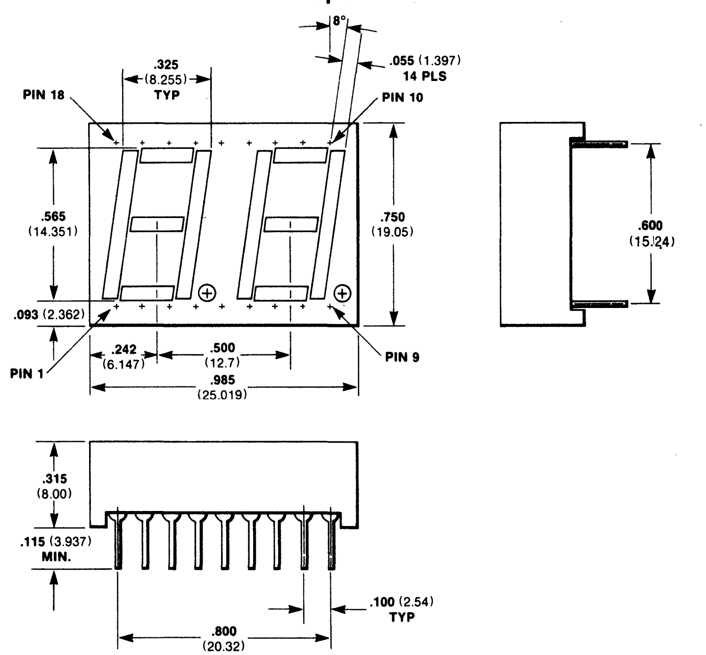
NOTES:
For polarity indication the surface is ribbed. The unlit LED segments cannot necessarily be seen through the lens cap.
Lens cap color is red for red LED
Pins 4, 6, 12 and 17 are common
All dimensions are ±.015 inch

All dimensions in inches (bold) and millimeters (parentheses)

Opto - 15

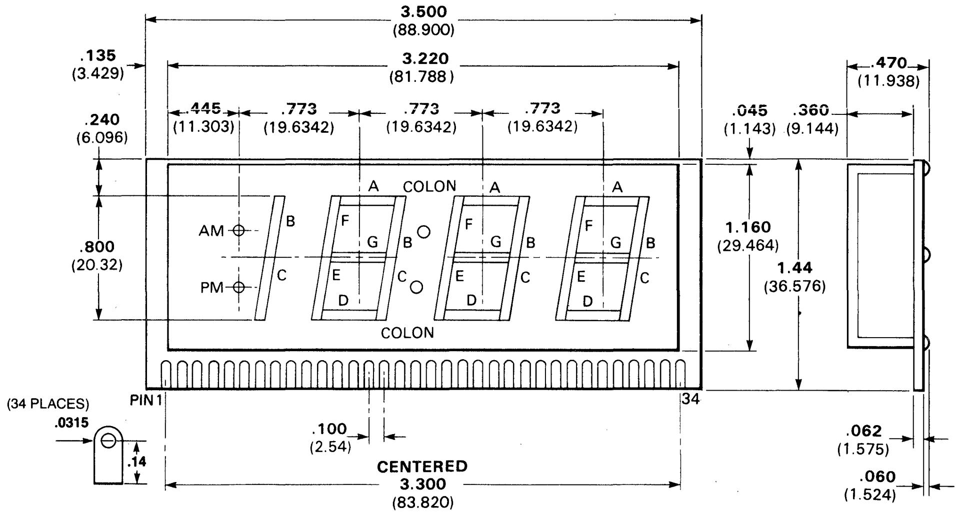


Opto - 16

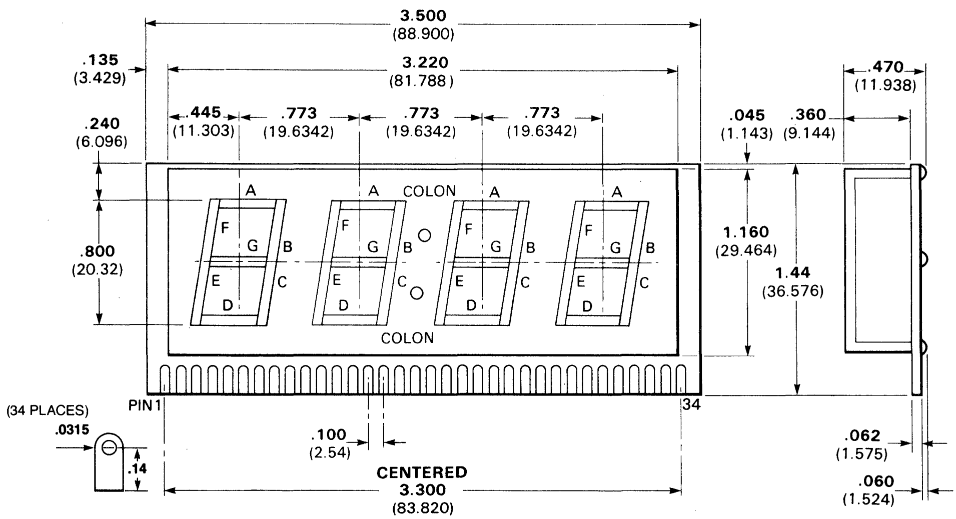


All dimensions in inches (bold) and millimeters (parentheses)

Opto - 17

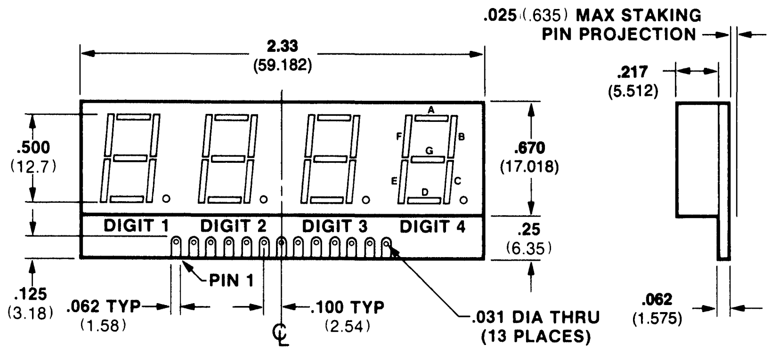


Opto - 18

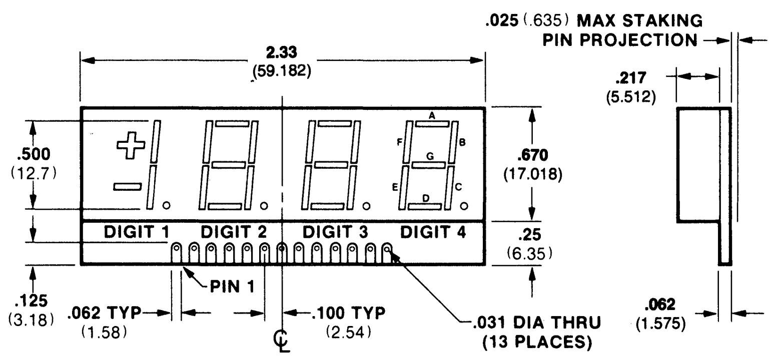


All dimensions in inches (bold) and millimeters (parentheses)

Opto - 20



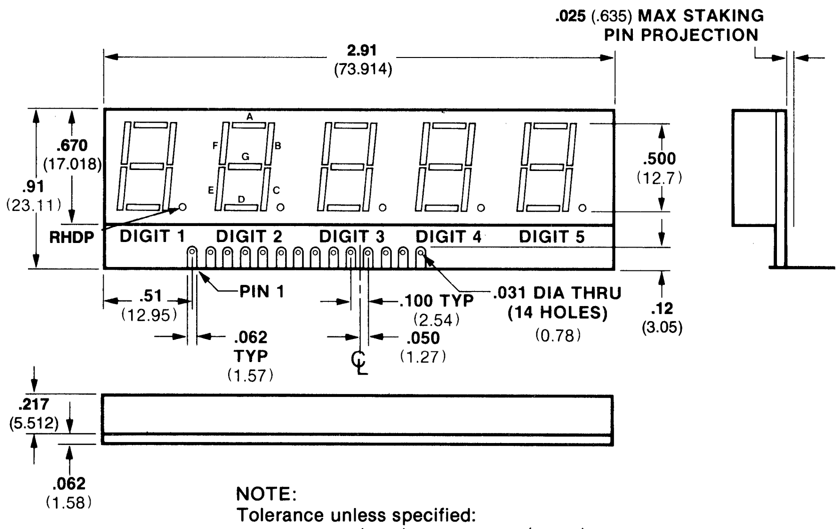
Opto - 21



All dimensions in inches (bold) and millimeters (parentheses)

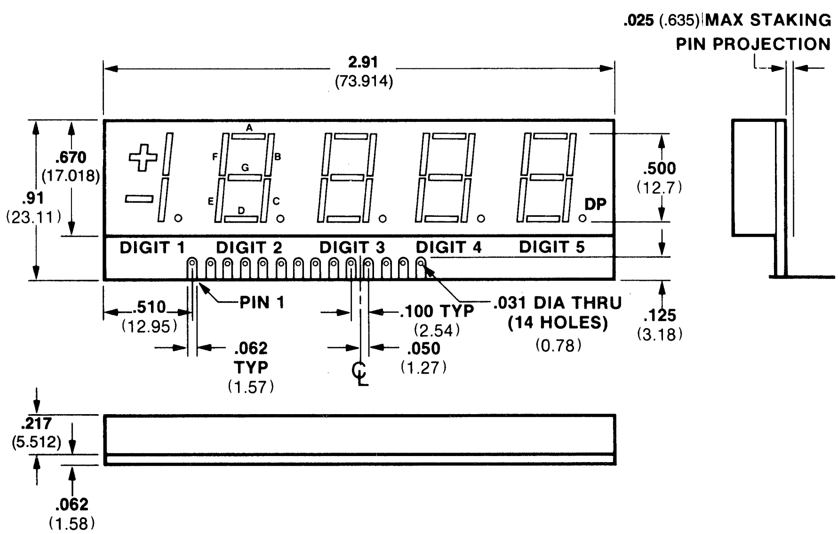
14

Opto - 22



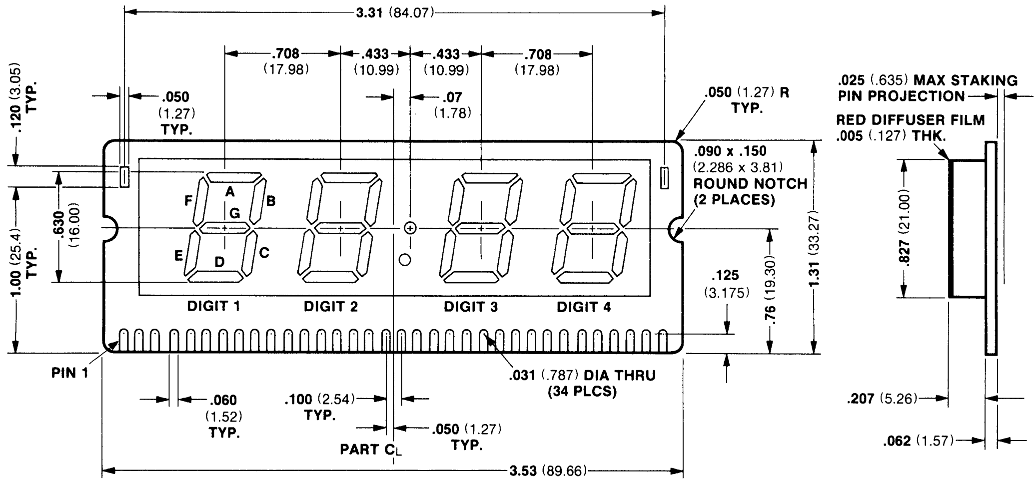
NOTE:
Tolerance unless specified:
.xx = ±.010 (0.25) .xxx = ±.005 (0.125)

Opto - 23



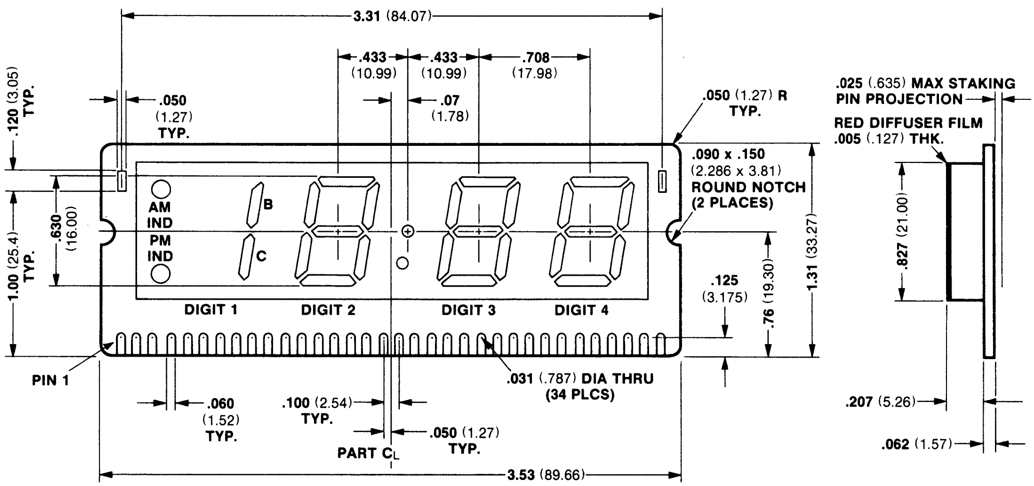
All dimensions in inches (bold) and millimeters (parentheses)

Opto-24



NOTE:
Colon cathodes tied to digits 3 & 4

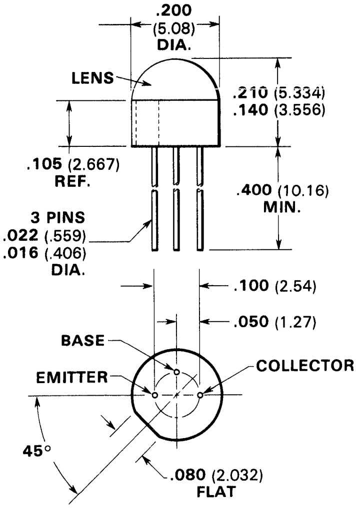
Opto-25



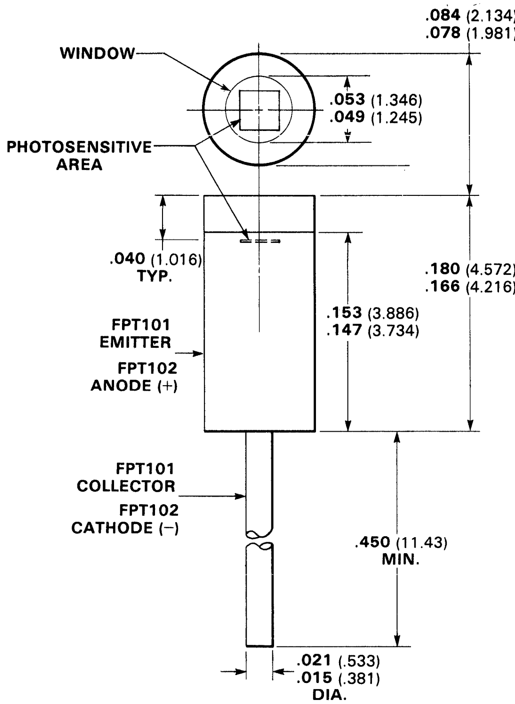
NOTE:
AM/PM Ind. cathodes tied to digits 1 & 2.
Colon cathodes tied to digits 3 & 4.

All dimensions in inches (bold) and millimeters (parentheses)

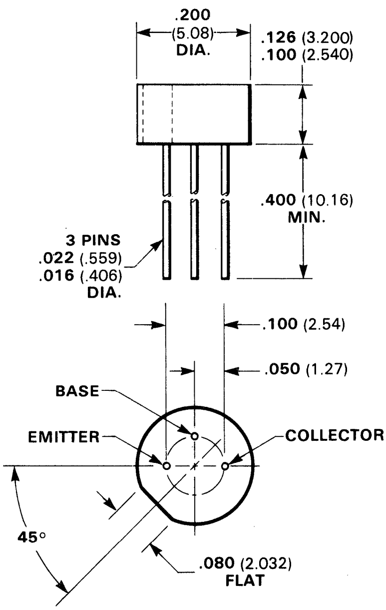
Opto - 26



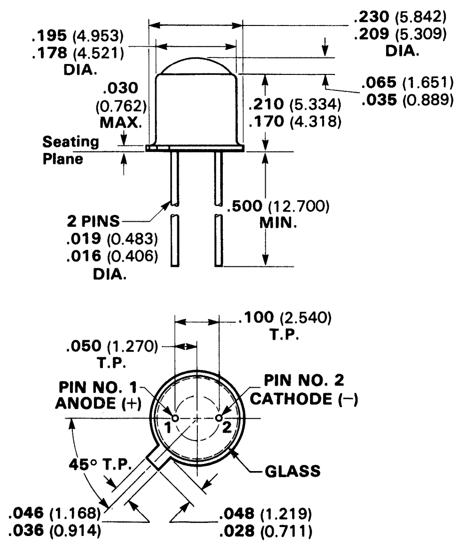
Opto - 27



Opto - 28

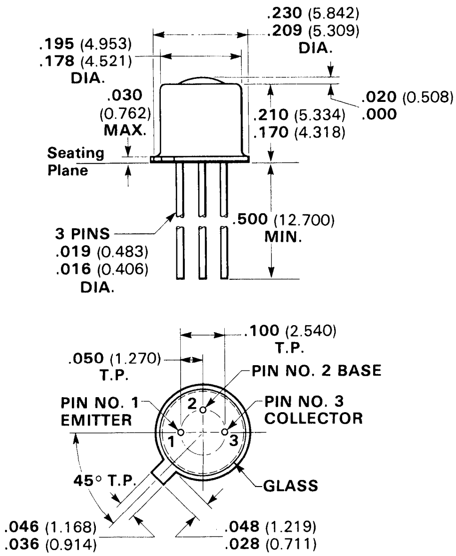


Opto - 29

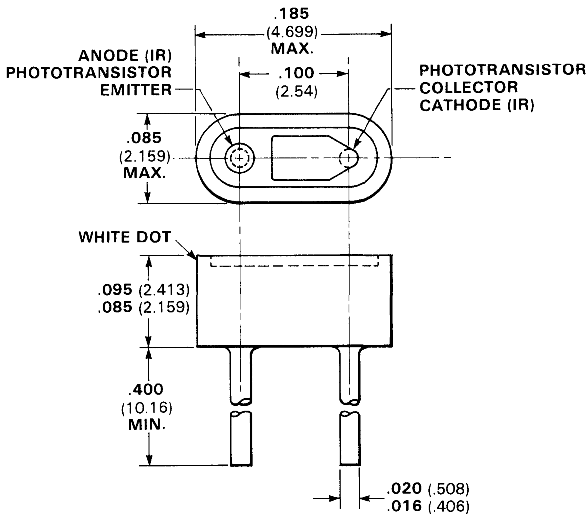


All dimensions in inches (bold) and millimeters (parentheses)

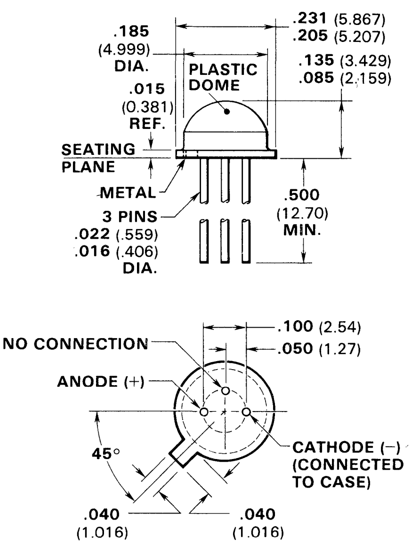
Opto - 30



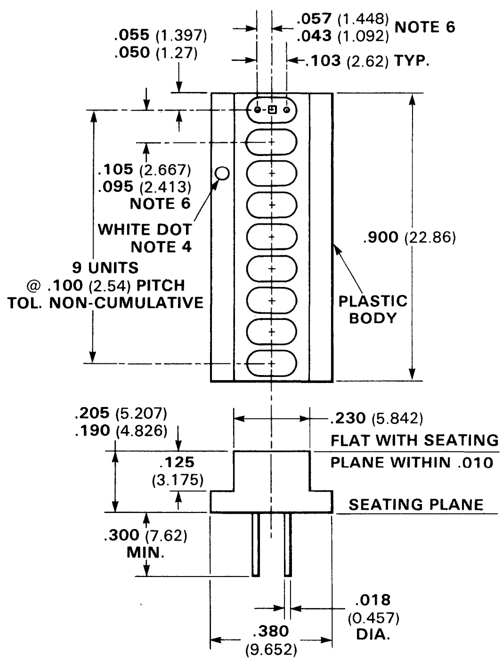
Opto - 31



Opto - 32

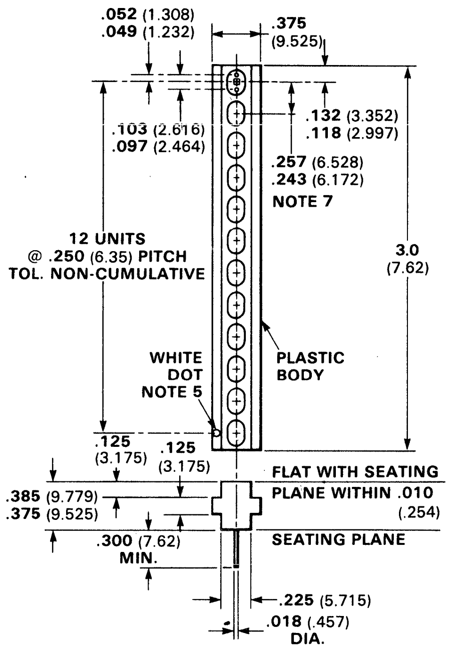


Opto - 33

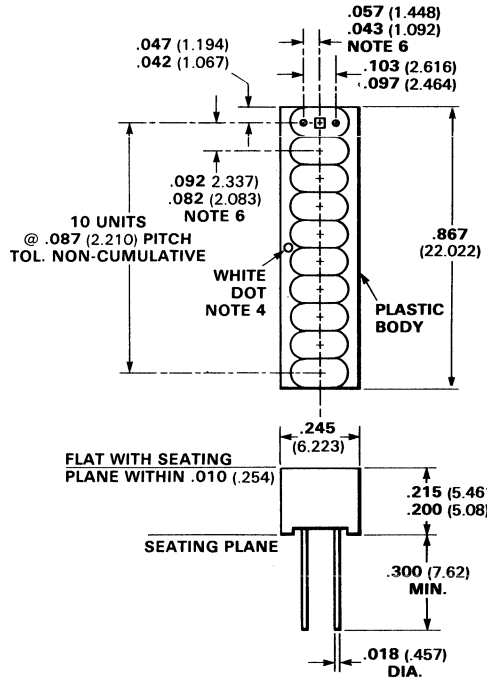


All dimensions in inches (bold) and millimeters (parentheses)

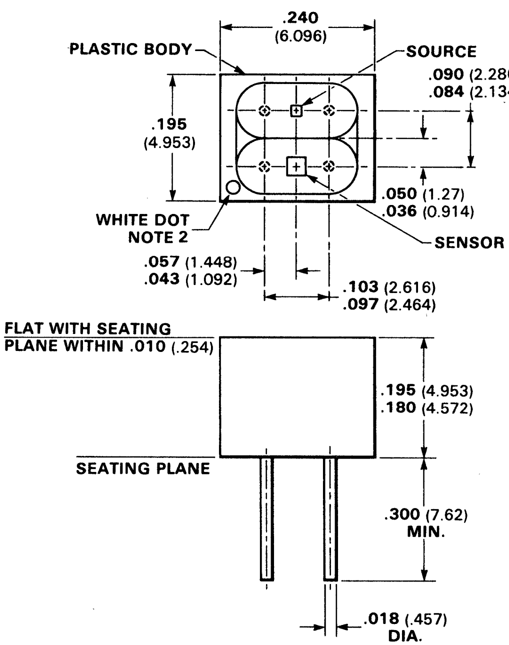
Opto-34



Opto-35

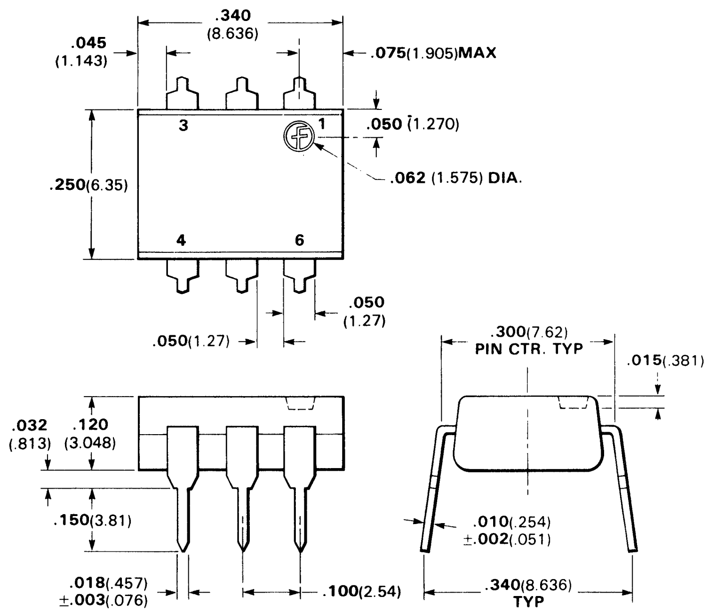


Opto-36

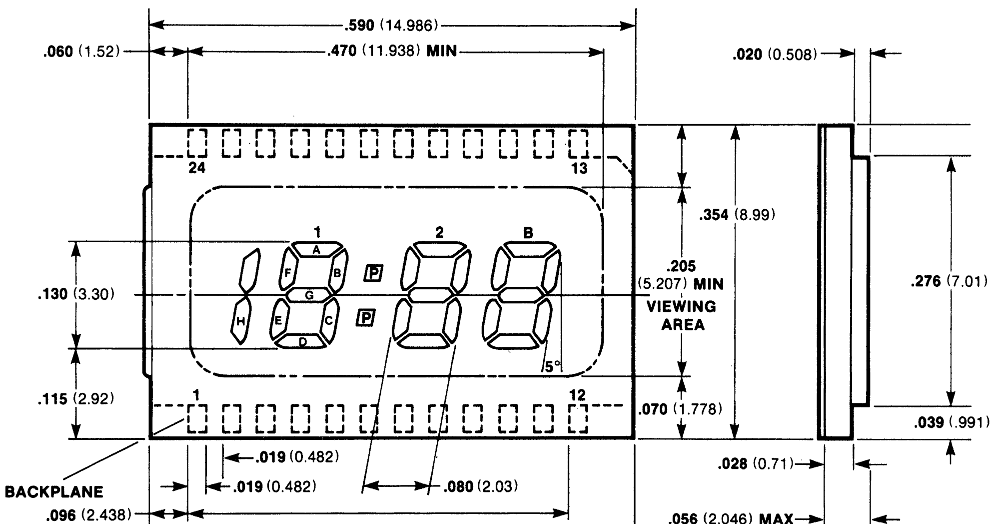


All dimensions in inches (bold) and millimeters (parentheses)

Opto - 37



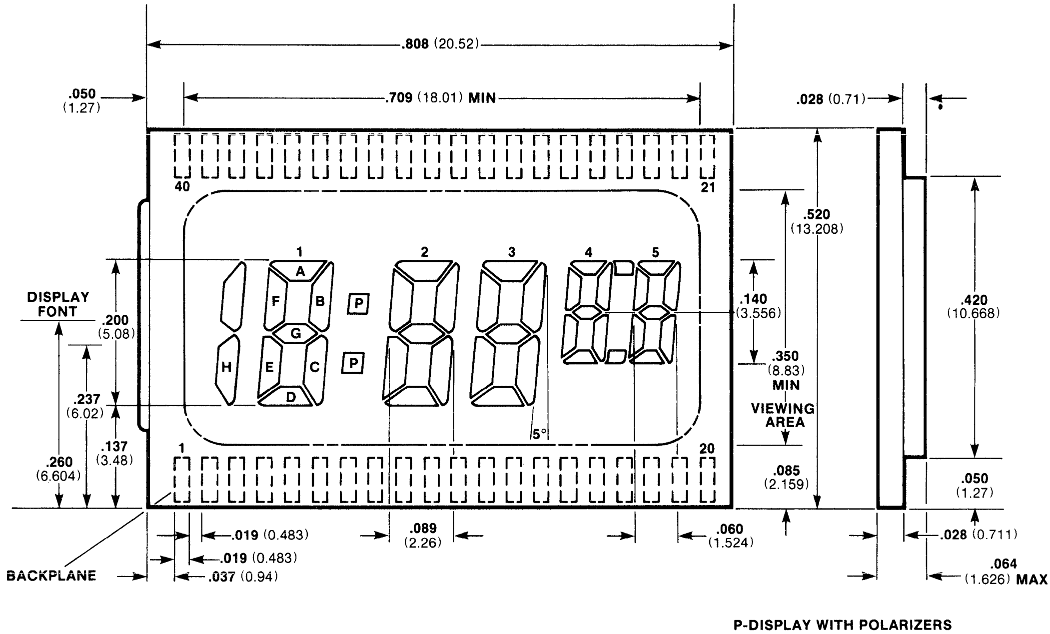
Opto - 38



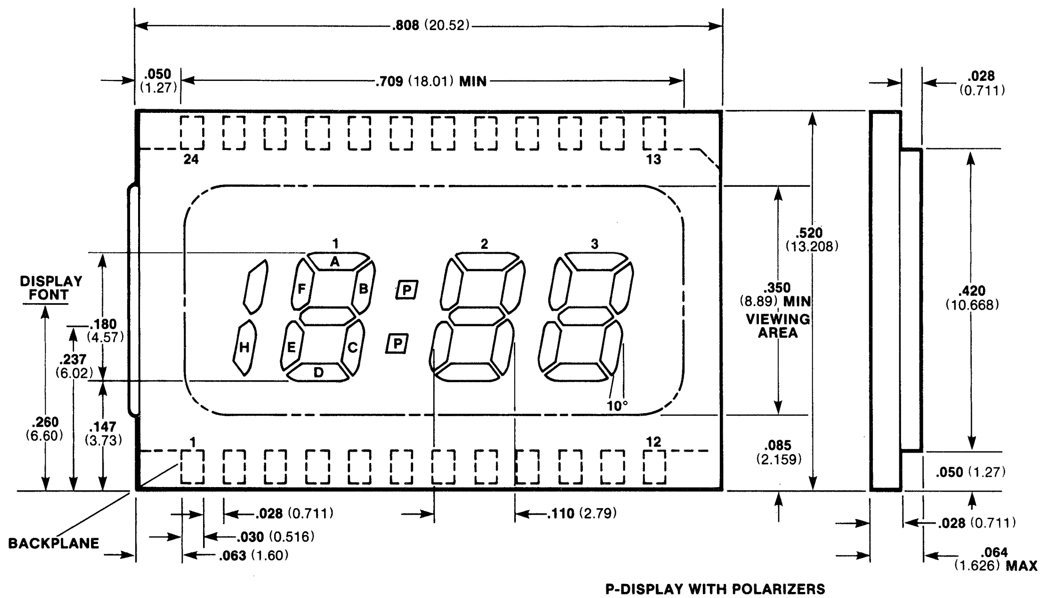
P-DISPLAY WITH POLARIZERS

All dimensions in inches (bold) and millimeters (parentheses)

Opto - 39

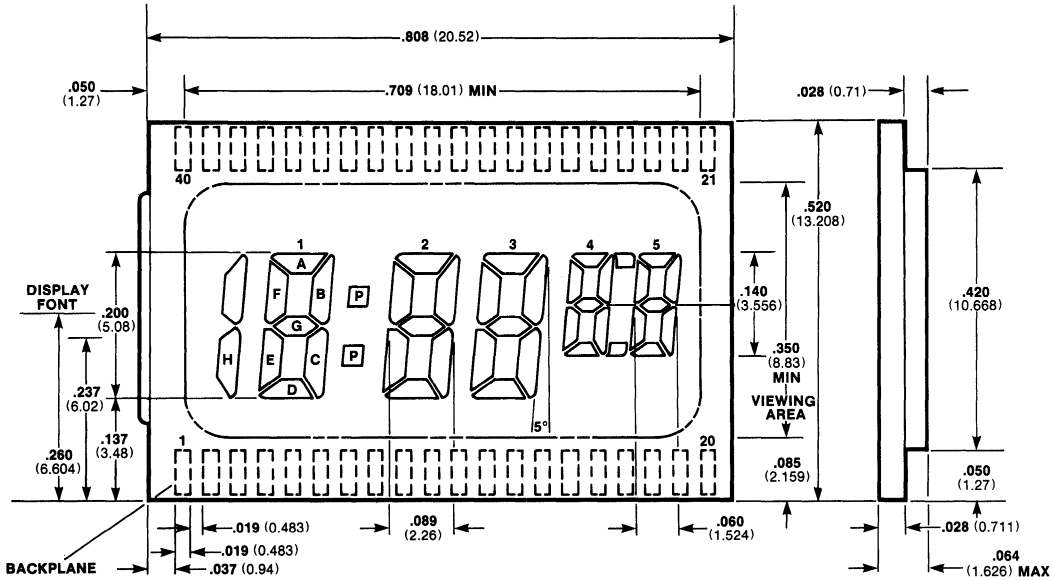


Opto - 40



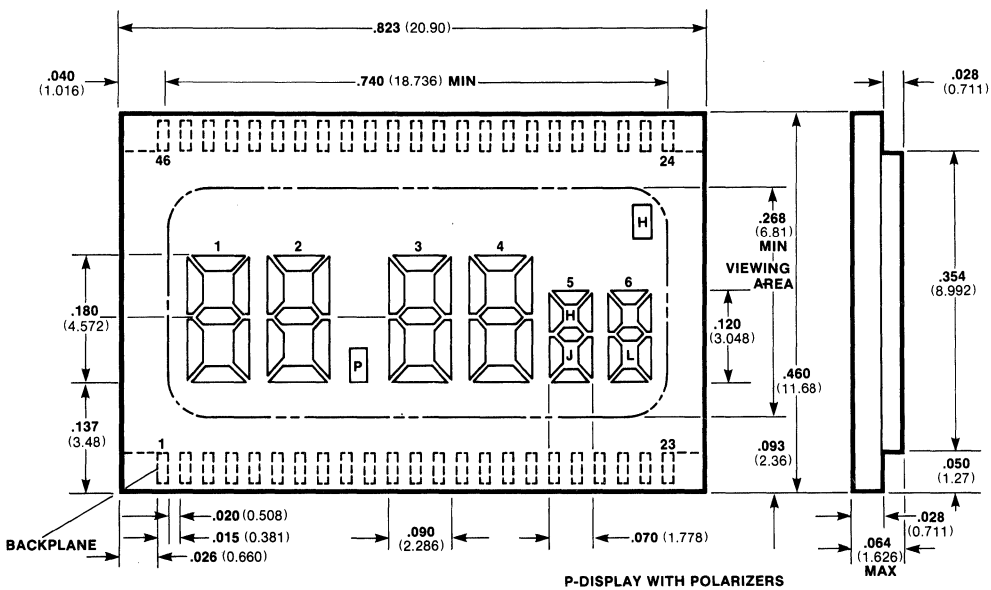
All dimensions in inches (bold) and millimeters (parentheses)

Opto-41



P-DISPLAY WITH POLARIZERS

Opto-42

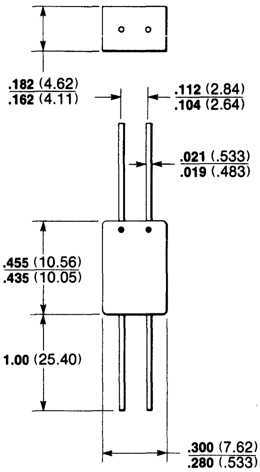


P-DISPLAY WITH POLARIZERS

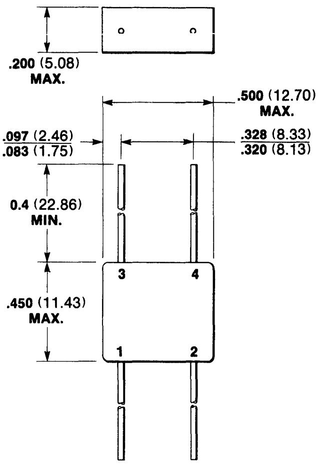
All dimensions in inches (bold) and millimeters (parentheses)

14

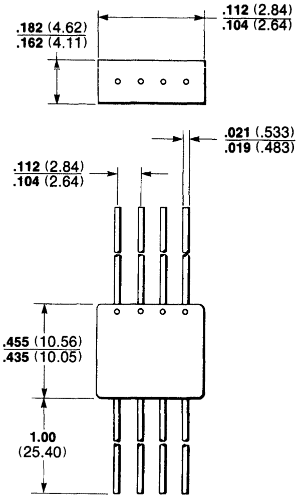
308



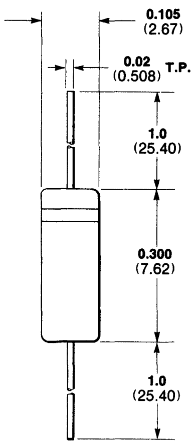
309



310

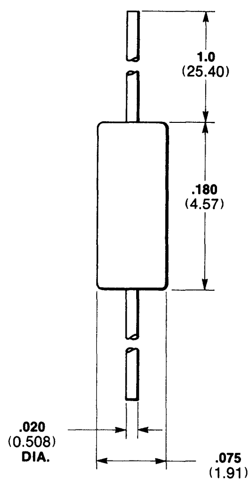


JEDEC DO-7 OUTLINE



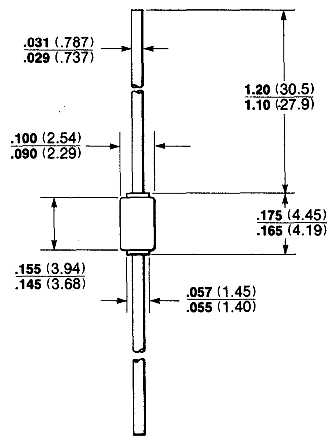
NOTES:
.020 diameter dumet pins, tinned or gold-plated
Hermetically sealed glass
Package weight is 0.25 grams

JEDEC DO-35 OUTLINE



NOTES:
.020 diameter dumet leads, tinned or gold-plated
Hermetically sealed glass
Package weight is 0.14 grams

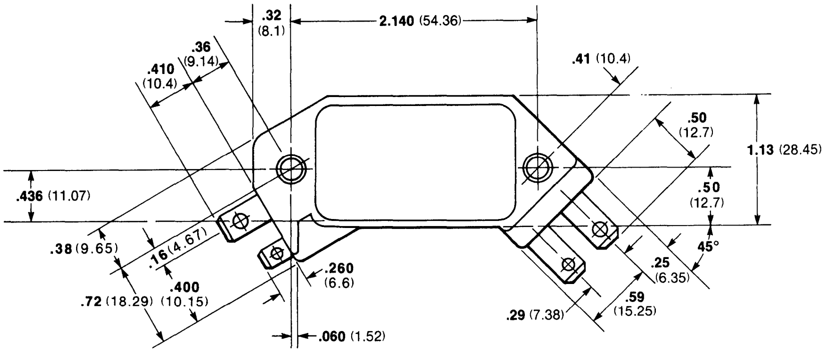
JEDEC DO-41 OUTLINE



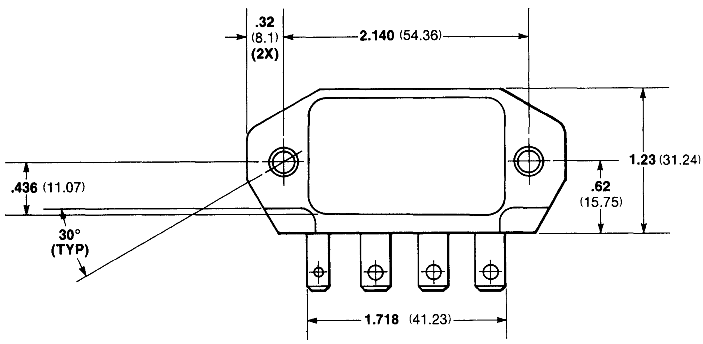
NOTES:
Hermetically sealed glass
Package weight is 0.14 grams

All dimensions in inches (bold) and millimeters (parentheses)

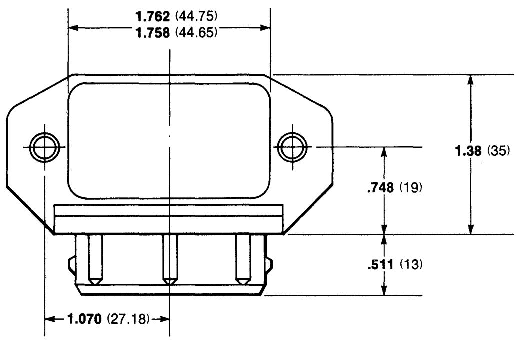
MODULE A



MODULE B



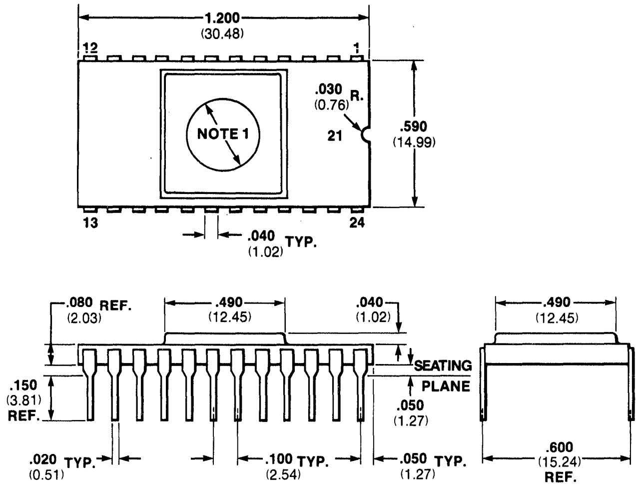
MODULE C



All dimensions in inches (bold) and millimeters (parentheses)

14

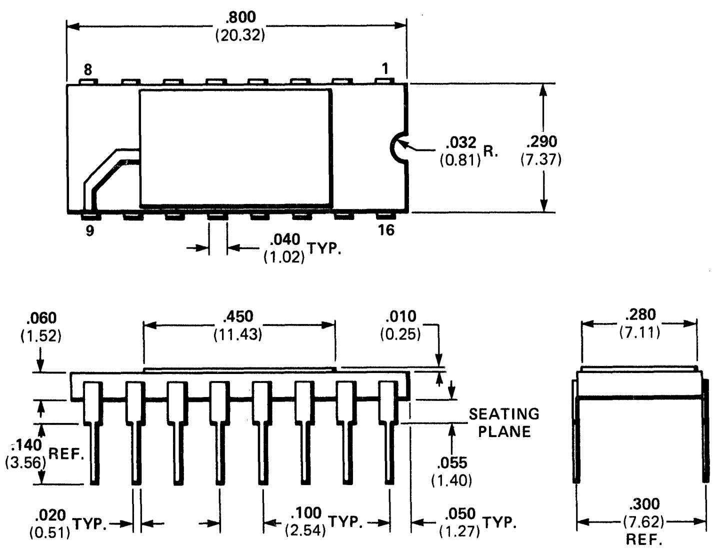
24-PIN SIDE-BRAZED



QA

NOTES:
Optical aperture is .300 (7.62) dia.
Header is white ceramic
Lid is gold-plated kovar with glass window
Pin No. 21 is common to substrate
Package is hermetic
Package weight is 4.5 grams

24-PIN SIDE-BRAZED

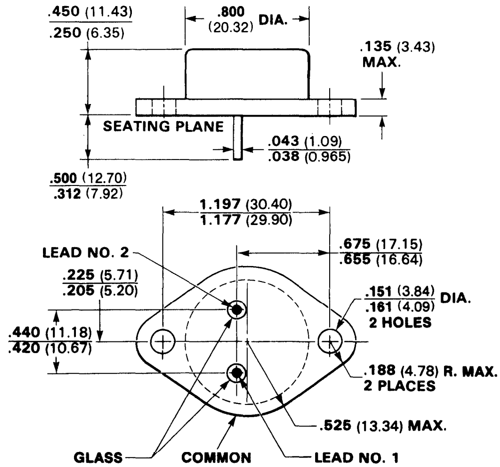


QB

NOTES:
Header body is black ceramic
Lid is gold-plated kovar
Pin No. 9 is common to substrate
Package is hermetic
Package weight is 1.1 grams

All dimensions in inches (bold) and millimeters (parentheses)

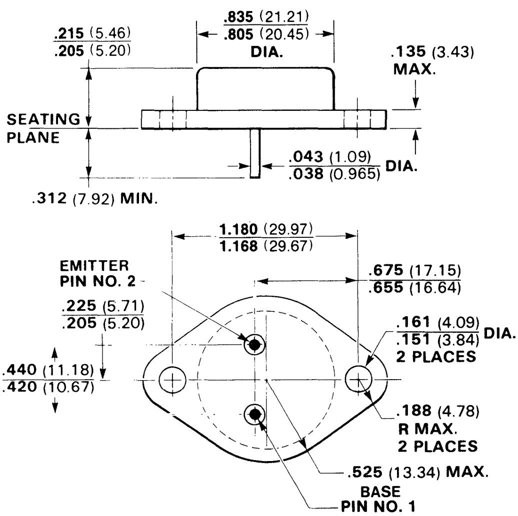
JEDEC TO-3 OUTLINE



AW

NOTES:
Leads 1 and 2 electrically isolated from case
Case is third electrical connection
Steel base
Package weight: 12.27 grams

JEDEC TO-3 OUTLINE



GD

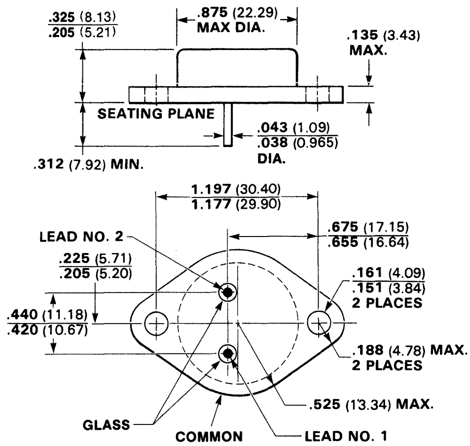
NOTES:
Pins are solder-dipped copper
Pins 1 and 2 electrically isolated from case
Case is third electrical connection
Copper base with braised moly disc. Pins are soldered in
Package weight is 18.0 grams
Aluminum cap

GF

NOTES:
Pins are alloy 52
Pins 1 and 2 electrically isolated from case
Case is third electrical connection
Copper base with soldered in pins
Aluminum cap
Package weight is 17.9 grams

All dimensions in inches (bold) and millimeters (parentheses)

JEDEC TO-3 OUTLINE*



GJ

NOTES:

Leads are gold-plated or solder dipped alloy 52

Leads 1 and 2 electrically isolated from case

Case is third electrical connection

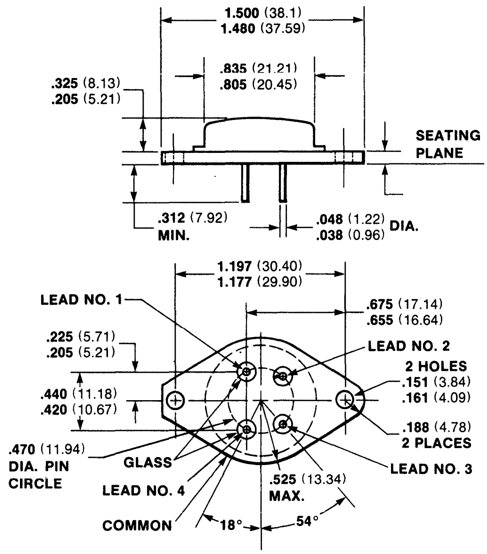
Aluminum package with copper slug, pins are soldered in

Package weight is 7.4 grams

Aluminum cap (may be dome-type, depending prod. line)

*Except lead diameter

JEDEC TO-3 OUTLINE*



GK

NOTES:

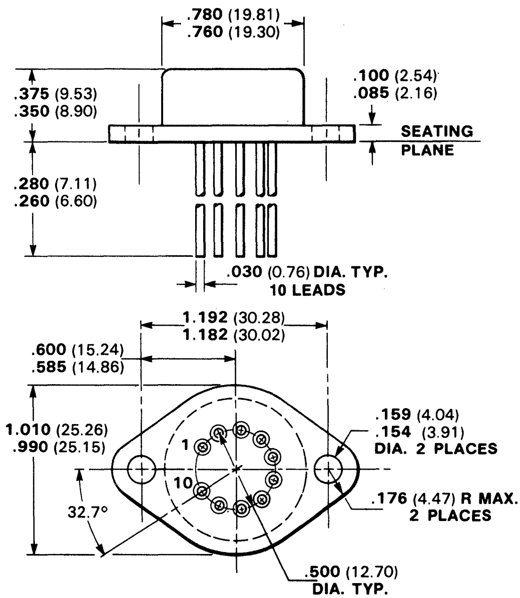
Leads are gold-plated or solder dipped alloy 52

All leads electrically isolated from case

Package weight is 7.4 grams

*Except number of leads and lead diameter

JEDEC TO-3 OUTLINE*



5H

NOTES:

Package material is nickel-plated CRS

Lead material is alloy 52

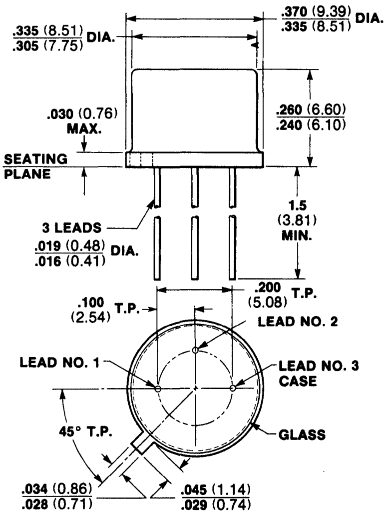
Glass material is corning 9010

Lead, post and base gold-plated

*Except height and number of leads

All dimensions in inches (bold) and millimeters (parentheses)

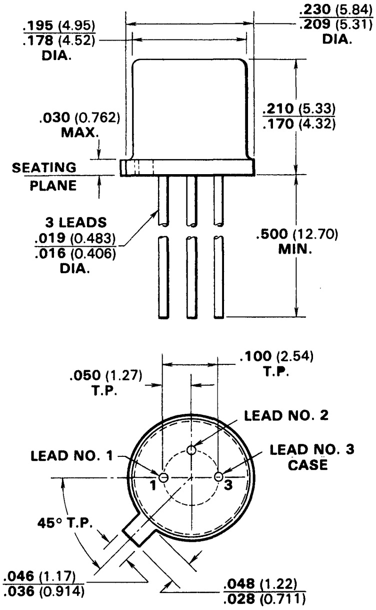
JEDEC TO-5 OUTLINE



XA

NOTES:
Leads are gold-plated kovar
Lead 3 connected to case
15 mil kovar header
Package weight is 1.11 grams

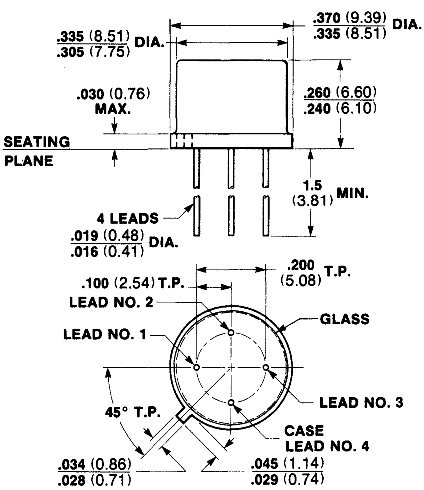
JEDEC TO-18 OUTLINE



XB

NOTES:
Leads are gold-plated kovar
Lead 3 connected to case
8 mil kovar header
Package weight is 0.44 gram

JEDEC TO-33 OUTLINE



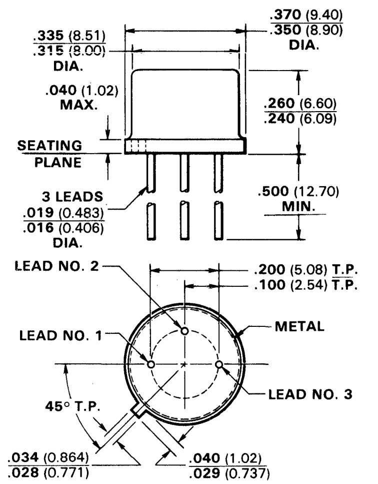
XR

NOTES:
Leads are gold-plated kovar
Lead 4 is connected to case
Internal collector lead length is 75 mils
Island is 60 mils wide, 80 mils long and 15 mils thick
Package weight is 1.22 grams

All dimensions in inches (bold) and millimeters (parentheses)

14

JEDEC TO-39 OUTLINE



BF

NOTES:
Leads are gold-plated kovar
Lead 3 connected to case
50 mil kovar header
Package weight is 1.23 grams

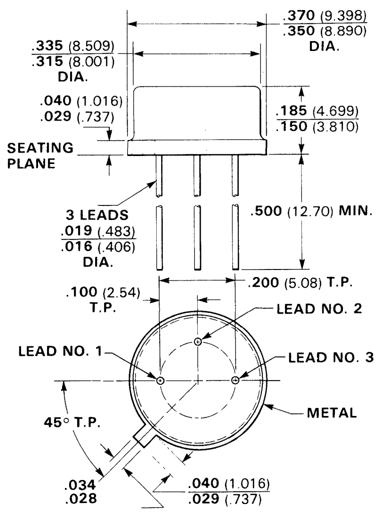
CS

NOTES:
Leads are solder dipped kovar
Lead 3 connected to case
This is a standard package and does not fall into the "special" classification
Package weight is 0.76 gram

5K

NOTES:
Leads are gold-plated kovar
Lead 3 connected to case
50 mil kovar header
Package weight is 1.23 grams

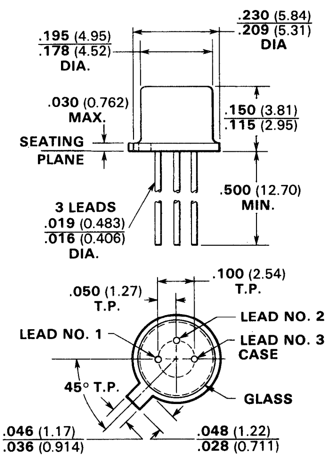
JEDEC TO-39 OUTLINE*



HC

NOTES:
Leads are gold-plated kovar
Lead 3 connected to case
Package weight is 1.23 grams
50 mil kovar header
*Dimensions same as JEDEC TO-39 except for can height

JEDEC TO-52 OUTLINE

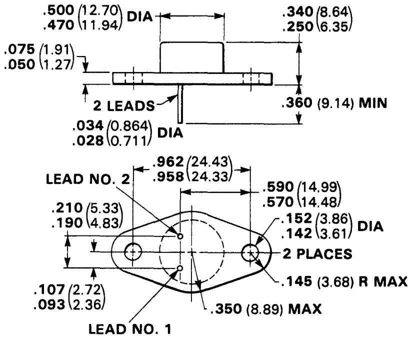


XH

NOTES:
Leads are gold-plated kovar
Lead 3 connected to case
8 mil kovar header
Package weight is 0.31 gram

All dimensions in inches (bold) and millimeters (parentheses)

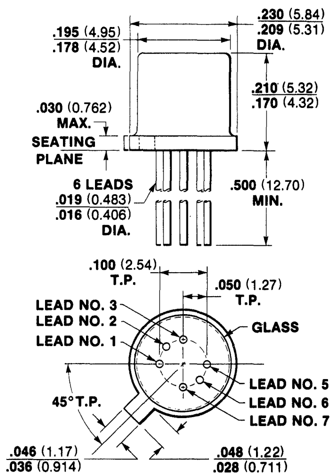
JEDEC TO-66 OUTLINE



GB

NOTES:
Leads are gold-plated kovar
Leads 1 and 2 electrically isolated from case
Case is third electrical connection
Nickel-plated steel base and cap
Package weight is 6.5 grams

JEDEC TO-71 OUTLINE



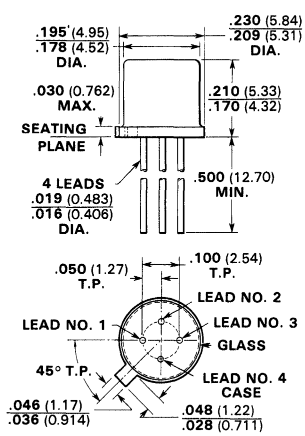
AB

NOTES:
Leads are gold-plated kovar
Lead 3 internally connected to one island
Lead 7 internally connected to other island
Leads 4 and 8 omitted
8 mil kovar header
Package weight is 0.60 gram

HM

NOTES:
Leads are gold-plated kovar
Leads 4 and 8 omitted
No island
8 mil kovar header
Package weight is 0.60 gram

JEDEC TO-72 OUTLINE



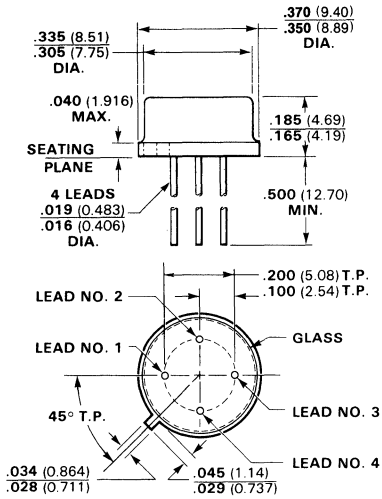
CR

NOTES:
Leads are gold-plated kovar
Lead 4 connected to case
Collector electrically isolated from case
Package weight is 0.36 gram

All dimensions in inches (bold) and millimeters (parentheses)

14

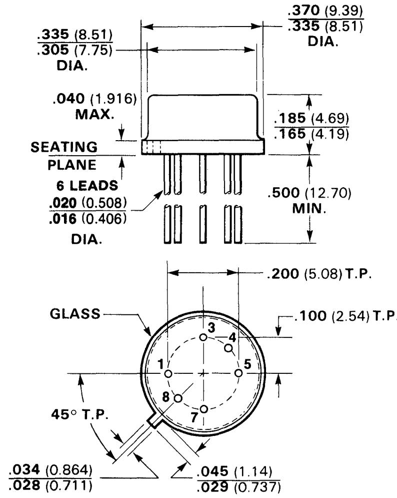
JEDEC TO-78 OUTLINE



HA

NOTES:
Leads are solder dipped to seating plane
Four leads thru
50 mil kovar header
Package weight is 1.08 grams

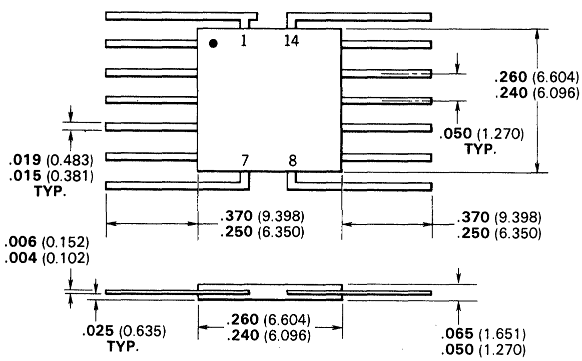
JEDEC TO-78 OUTLINE



5C

NOTES:
Leads are solder dipped to within .040 of seating plane
Six leads through
Leads 2 and 6 are omitted
50 mil kovar header
Package weight is 0.95 gram

JEDEC TO-86 OUTLINE

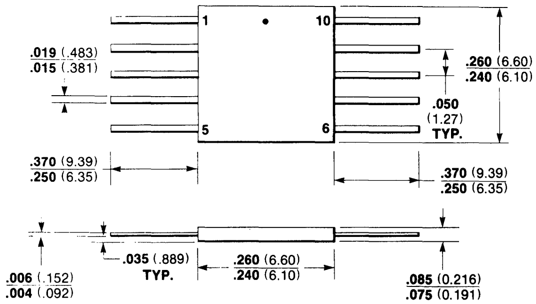


3I

NOTES:
Leads are tin-plated 42 alloy
Hermetically sealed alumina package
Lead 1 orientation may be either tab or dot
Cavity size is .130 (3.30)
Package weight is 0.26 gram

All dimensions in inches (bold) and millimeters (parentheses)

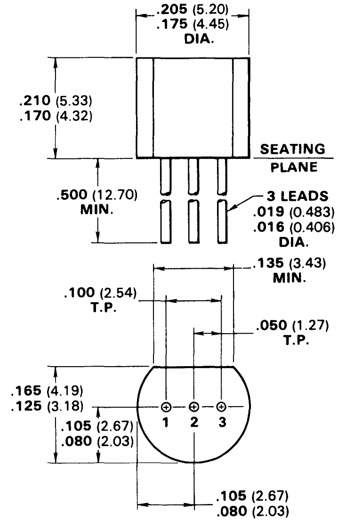
JEDEC TO-91 OUTLINE



3F

NOTES:
Leads are tin plated 42 alloy
Hermetically sealed alumina package
Cavity size is .130 (3.30) diameter
Package weight is 0.26 grams

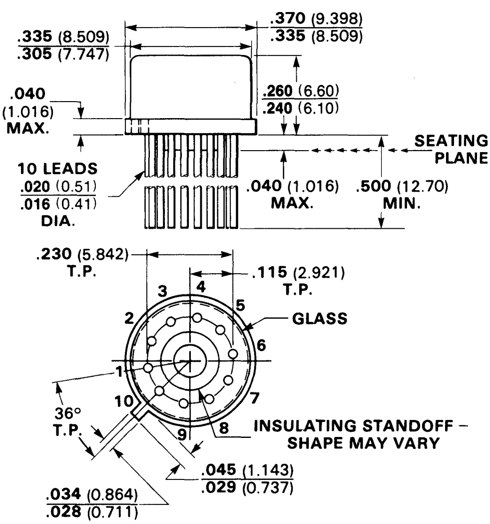
JEDEC TO-92 OUTLINE



EG

NOTES:
Package material is transfer molded thermosetting plastic
Package weight is 0.25 gram

JEDEC TO-96 OUTLINE*

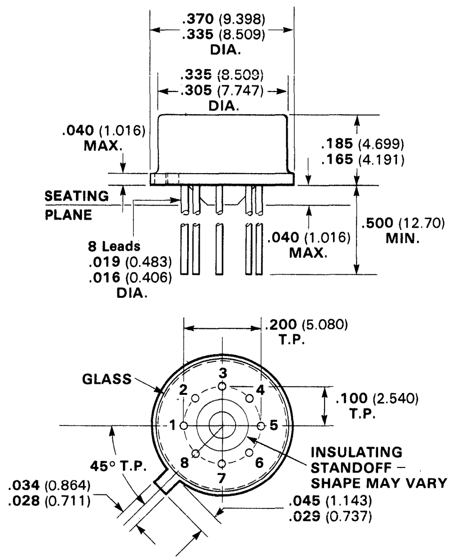


5R

NOTES:
Leads are gold-plated kovar.
Nine leads thru, Lead No. 5 is connected to case
15 mil kovar header
Package weight is 1.32 grams.
*Dimensions similar to JEDEC TO-96 except for standoff.

All dimensions in inches (bold) and millimeters (parentheses)

JEDEC TO-99 OUTLINE



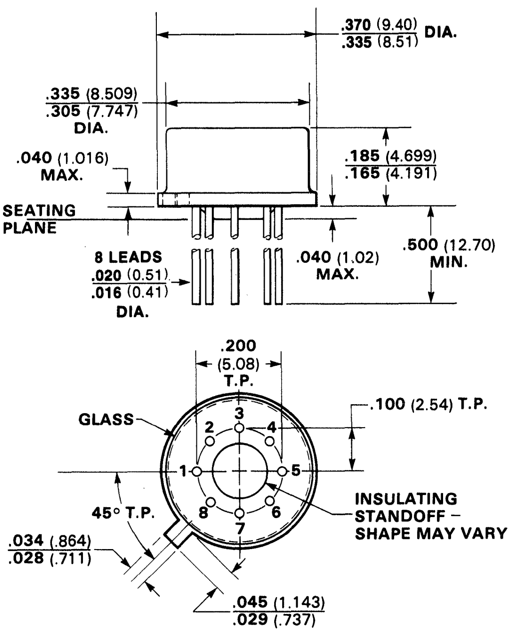
5B

NOTES:
Leads are gold-plated kovar
Seven leads thru leads No. 4 connected to case
15 mil kovar header
Package weight is 1.22 grams

5L

NOTES:
Leads are gold-plated kovar
Eight leads thru
15 mil kovar header
Package weight is 1.22 grams

JEDEC TO-99 OUTLINE



5M

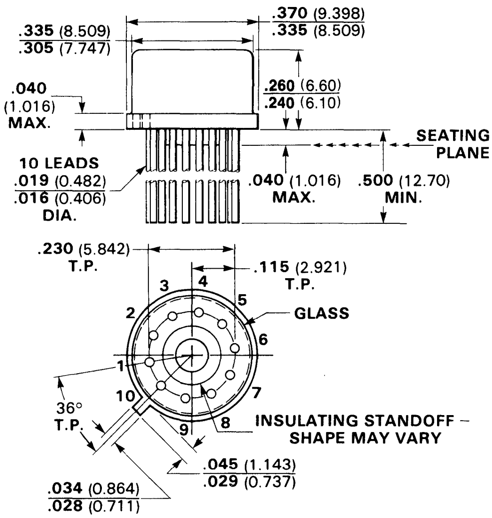
NOTES:
Leads are solder dipped to seating plane
Eight leads thru
15 mil kovar header
Package weight is 1.22 grams

5S

NOTES:
Leads are solder dipped to seating plane
Seven leads thru, leads No. 4 connected to case
15 mil kovar header
Package weight is 1.22 grams

All dimensions in inches (bold) and millimeters (parentheses)

JEDEC TO-100 OUTLINE



5E

NOTES:
Leads are gold-plated kovar
Ten leads thru
15 mil kovar header
Package weight is 1.32 grams

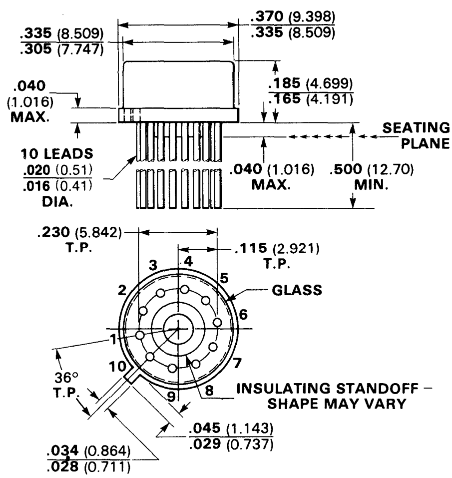
5F

NOTES:
Leads are gold-plated kovar
Nine leads through, lead 5 connected to case
15 mil kovar header
Package weight is 1.32

5I

NOTES:
Leads are solder dipped to the seating plane
Ten leads thru
High RTH package
15 mil kovar header
Package weight is 1.32 grams

JEDEC TO-100 OUTLINE



5N

NOTES:
Leads are solder-dipped to the seating plane
Nine leads through, lead 5 connected to case
15 mil kovar header
Package weight is 1.32 grams

5Q

NOTES:
Leads are solder dipped to the seating plane
Ten leads thru
15 mil kovar header
Package weight is 1.32 grams

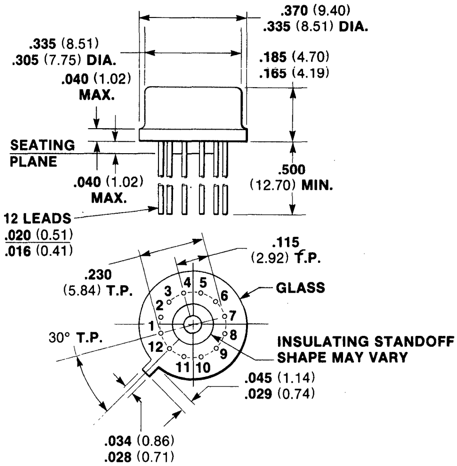
5U

NOTES:
Leads are gold-plated kovar
Ten leads through
High RTH package
15 mil kovar header
Package weight is 1.32 grams

All dimensions in inches (bold) and millimeters (parentheses)

14

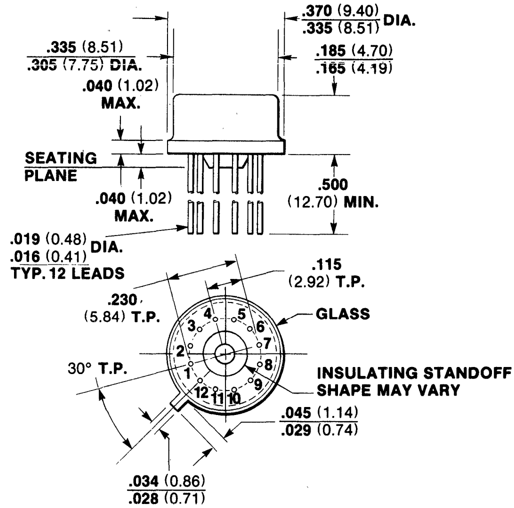
JEDEC TO-101 OUTLINE



5D

NOTES:
Leads are solder dipped to the seating plane
Twelve leads through
15 mil kovar header
Package weight is 1.4 grams

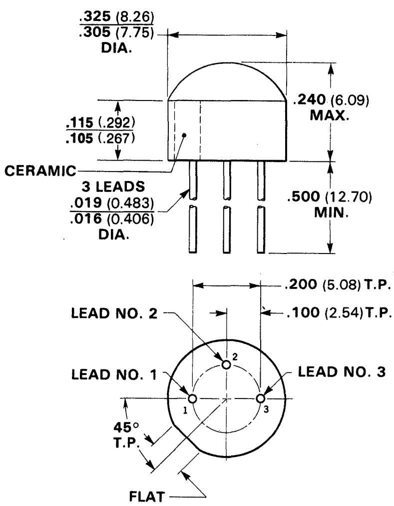
JEDEC TO-101 OUTLINE



5G

NOTES:
Leads are gold-plated kovar
Twelve leads thru
15 mil kovar header
Package weight is 1.08 grams

JEDEC TO-105 OUTLINE

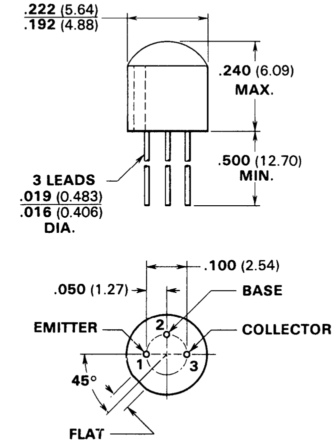


CZ

NOTES:
Leads 1 and 2 are gold-plated nickel
Lead No. 3 is gold-plated copper alloy
Internal lead No. 3 length is 110 mils
Lead No. 3 club head length is 180 mils
Package weight is 0.66 grams

All dimensions in inches (bold) and millimeters (parentheses)

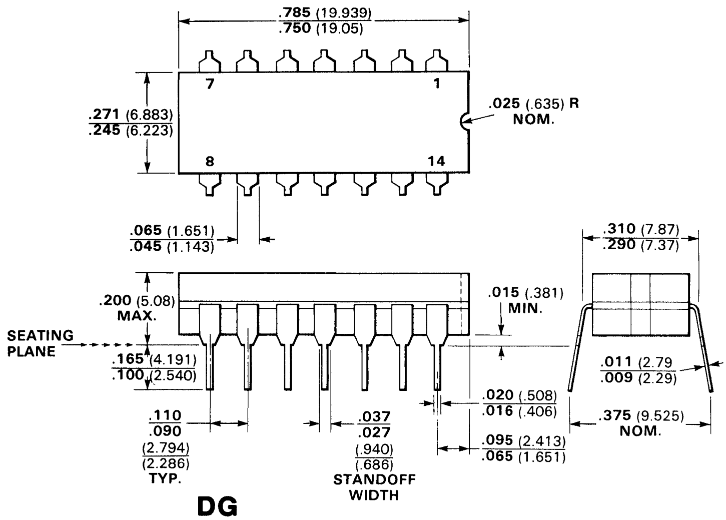
JEDEC TO-106 OUTLINE



CY

NOTES:
Leads 1 and 2 are gold-plated nickel
Lead No. 3 is gold-plated copper alloy
Lead No. 3 club head length is 85 mils
Internal lead No. 3 length is 110 mils
Package weight is 0.31 grams

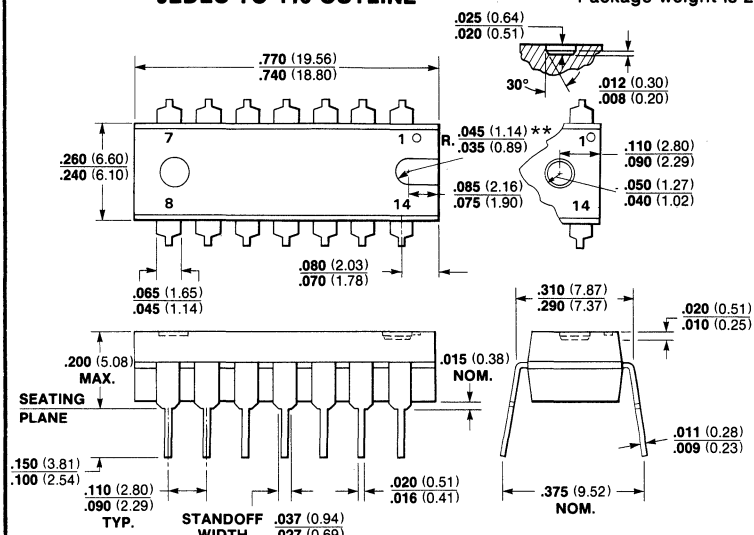
JEDEC TO-116 OUTLINE



DG

NOTES:
Pins are tin-plated kovar
Pins are intended for insertion in hole rows on .300" centers
They are purposely shipped with 'positive' misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020 inch diameter pin
Hermetically sealed alumina ceramic package
Gain IC's
Package weight is 2.0 grams

JEDEC TO-116 OUTLINE



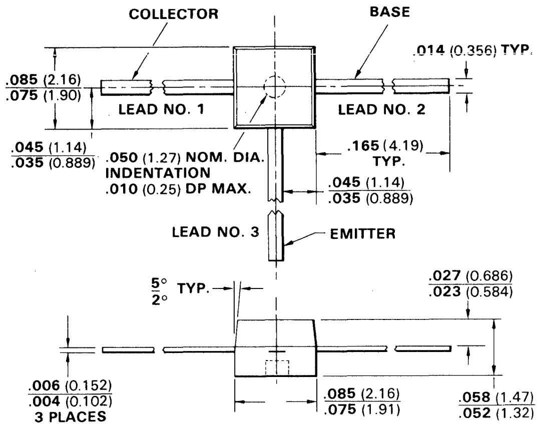
9A

NOTES:
Pins are tin plated kovar
*Package material varies depending on the product line
Pins are intended for insertion in hole rows on .300" (7.62) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020 (0.508) inch diameter pin
**Notch or ejector hole varies depending on the product line
Package weight is 0.9 gram

All dimensions in inches (bold) and millimeters (parentheses)

14

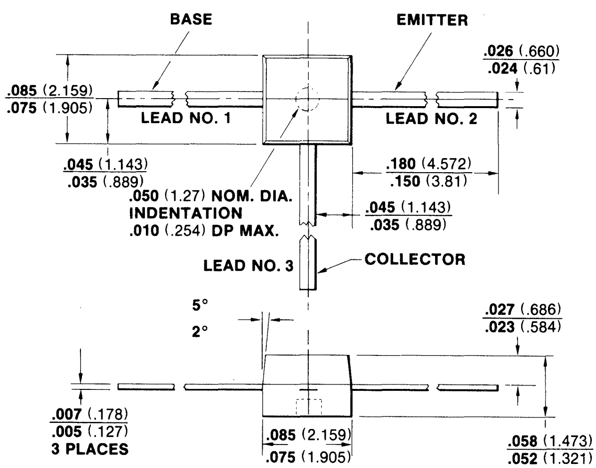
JEDEC TO-120 OUTLINE



EE

NOTES:
Leads are gold-platd nickel alloy
Body is transfer molded thermosetting plastic
Package weight is 0.015 gram

JEDEC TO-120 OUTLINE

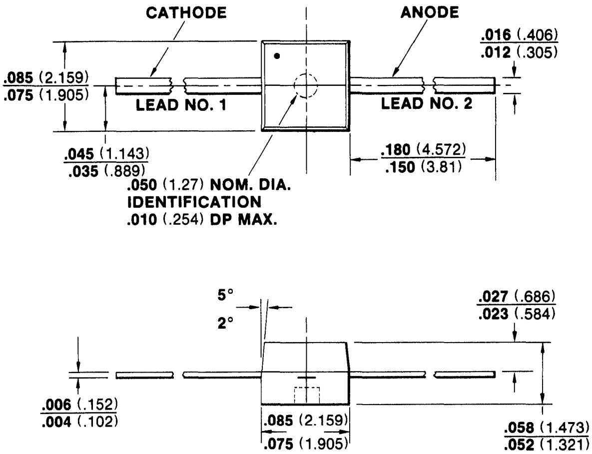


EF

NOTES:
Leads are gold-plated
Body is transfer molded thermosetting plastic
Package weight is 0.015 gram

All dimensions in inches (bold) and millimeters (parentheses)

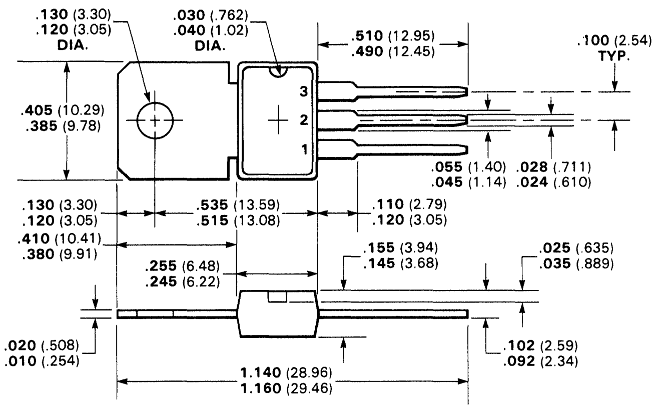
JEDEC TO-120 OUTLINE



EK

NOTES:
Leads are nickel-plated copper alloy
Package material is plastic
Package weight is 0.015 gram

JEDEC TO-202 OUTLINE
DYNAWATT



NT

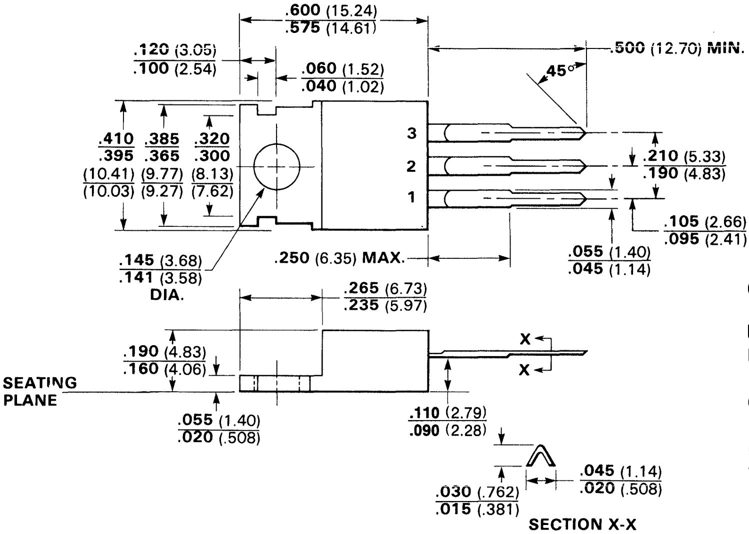
NOTES:
Pin out
- Emitter - 1
- Base - 2
- Collector - 3/4

Assembled weight 0.7 grams
Tab and leads - tin plated copper
Plastic - epoxy

All dimensions in inches (bold) and millimeters (parentheses)

14

JEDEC TO-220 OUTLINE*



GH

NOTES:

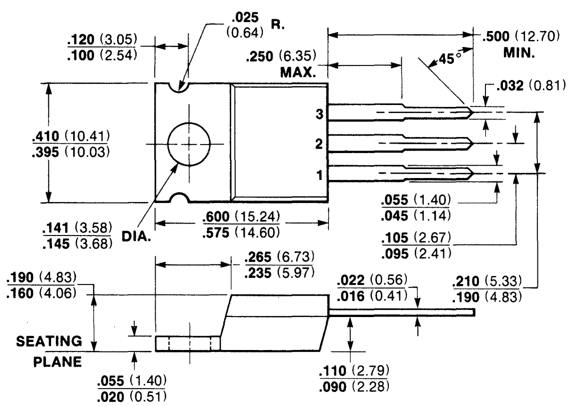
Package is silicone plastic with nickel-plated copper tab and pins

Center pin is electrical contact with the mounting tab

Package weight is 2.1 grams

*Mechanically interchangable with TO-66

JEDEC TO-220 OUTLINE*



GH(-3)

NOTES:

Package is epoxy plastic with plated copper tab and pins

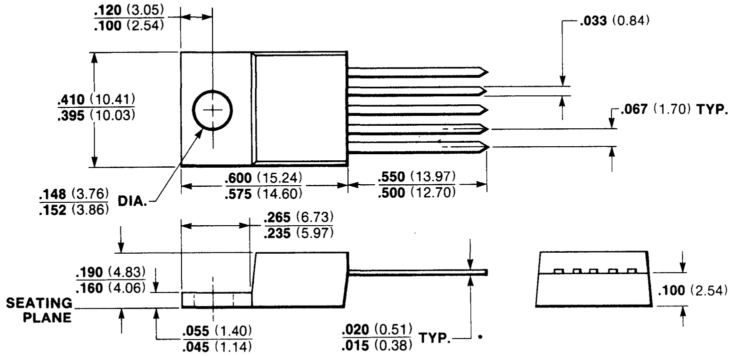
Center pin is electrical contact with the mounting tab

Package weight is 2.1 grams

***Mechanically interchangable with TO-66**

All dimensions in inches (bold) and millimeters (parentheses)

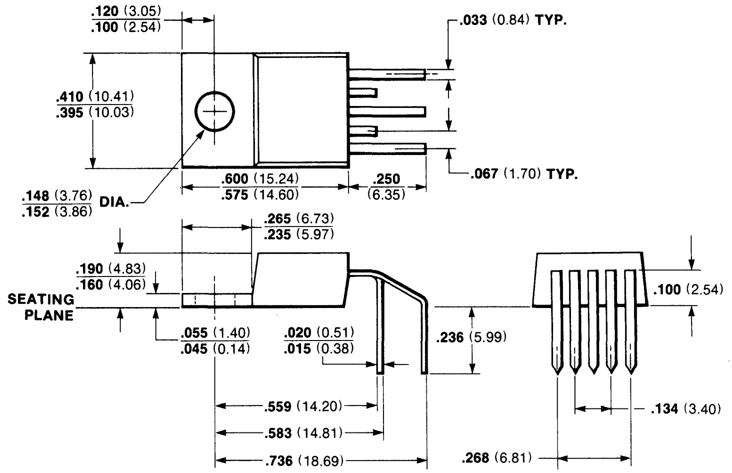
JEDEC TO-220 OUTLINE



GO

NOTES:
Mounting tab electrically connected to center pin
Package is molded over a copper base material with solderable pins
Package weight is 2.1 grams
*Except number of pins

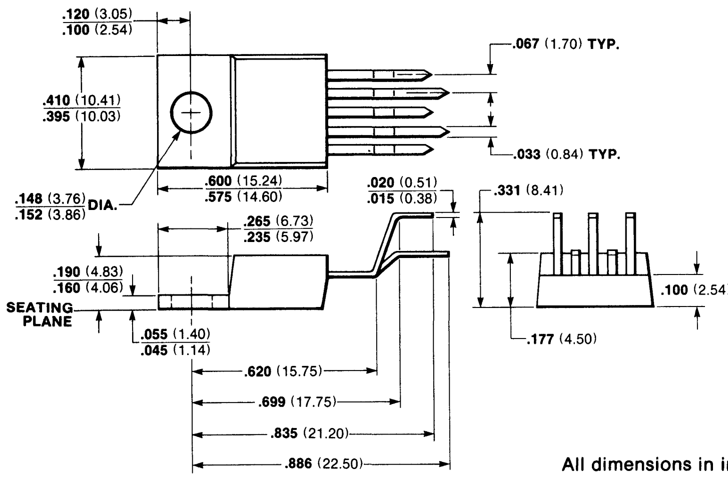
JEDEC TO-220 OUTLINE*



GO(H)

NOTES:
Mounting tab electrically connected to center pin
Package is molded over a copper base material with solderable pins
Package weight is 2.1 grams
*Except pin number and formation

JEDEC TO-220 OUTLINE*



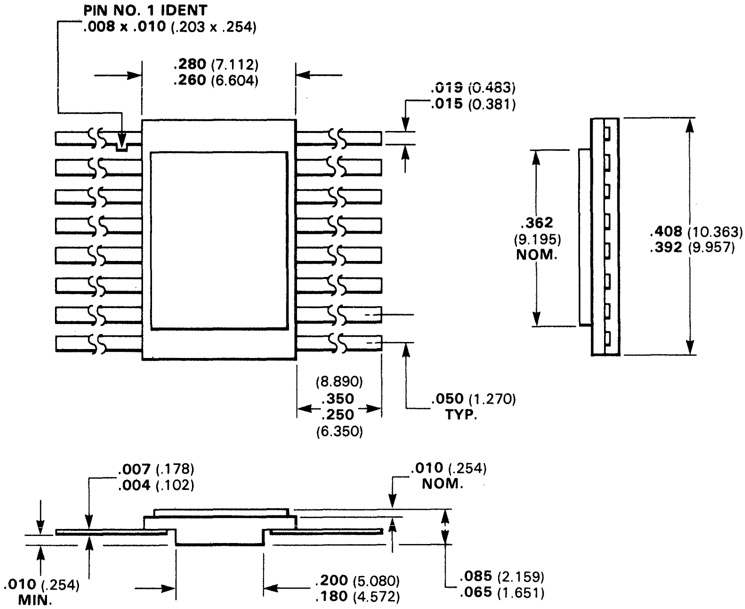
GO(V)

NOTES:
Mounting tab electrically connected to center pin
Package is molded over a copper base material with solderable pins
Package weight is 2.1 grams
*Except pin number and formation

All dimensions in inches (bold) and millimeters (parentheses)

14

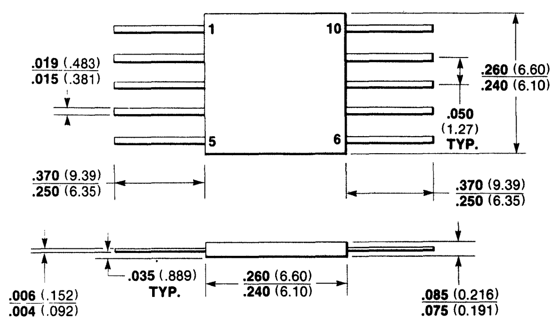
16-PIN SIDE-BRAZED CERPAK



3D

NOTES:
Header body is black ceramic
Lid is gold plated kovar
Pin No. 9 is common to substrate
Package is hermetic
Package weight is 1.1 grams

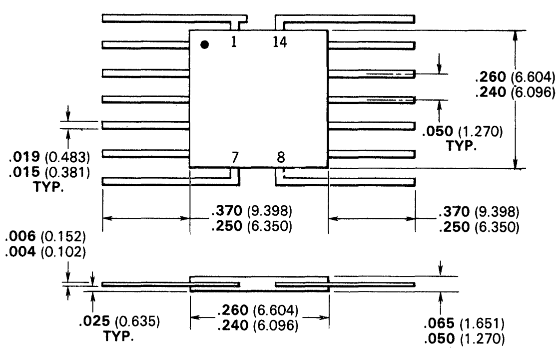
10-PIN CERPAK
(JECEC TO-91 OUTLINE)



3F

NOTES:
Leads are tin plated 42 alloy
Hermetically sealed alumina package
Cavity size is .130 diameter
Package weight is 0.26 grams

14-PIN CERPAK
(JEDEC TO-86 OUTLINE)

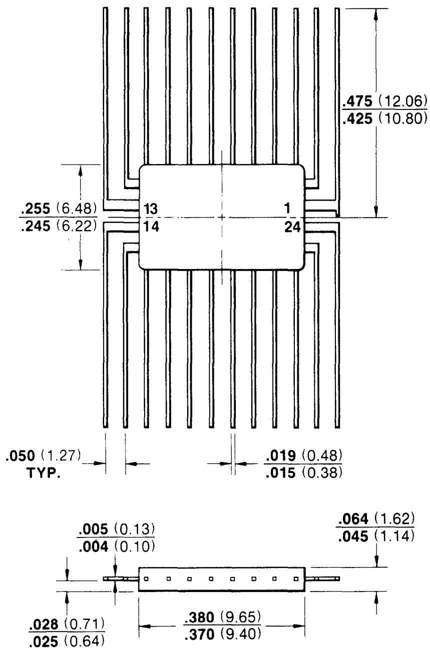


3I

NOTES:
Leads are tin-plated 42 alloy
Hermetically sealed alumina package
Lead 1 orientation may be either tab or dot
Cavity size is .130 (3.30)
Package weight is 0.26 gram

All dimensions in inches (bold) and millimeters (parentheses)

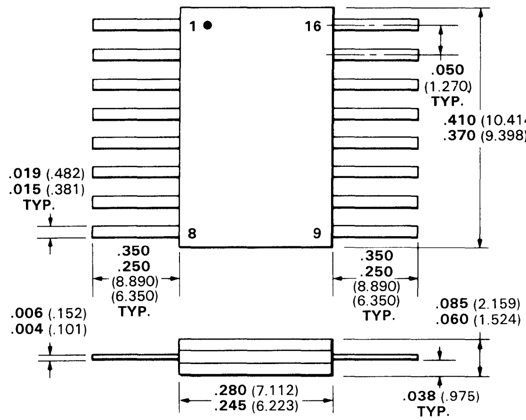
24-PIN FLATPAK



3M

NOTES:
Pins are gold-plated kovar
Package material is kovar
Cavity size is .120 x .235 (3.05 x 5.97)
Package weight is 0.8 gram

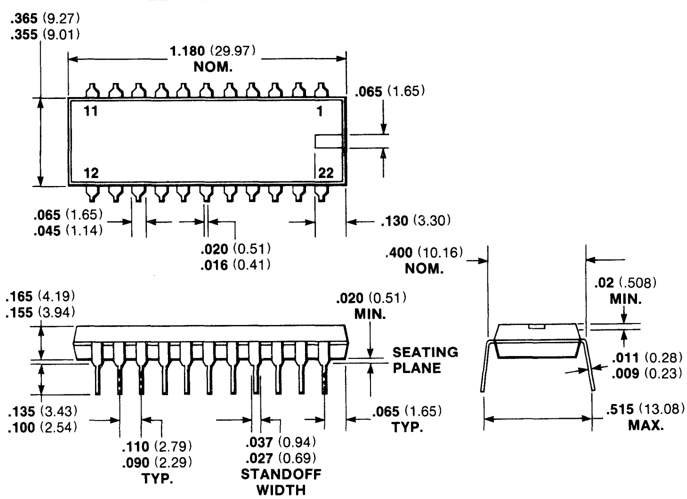
16-PIN CERPAK



4B

NOTES:
Pins are gold-plated kovar
Cap and base are alumina
Package weight is 0.4 gram

22-PIN PLASTIC DUAL IN-LINE

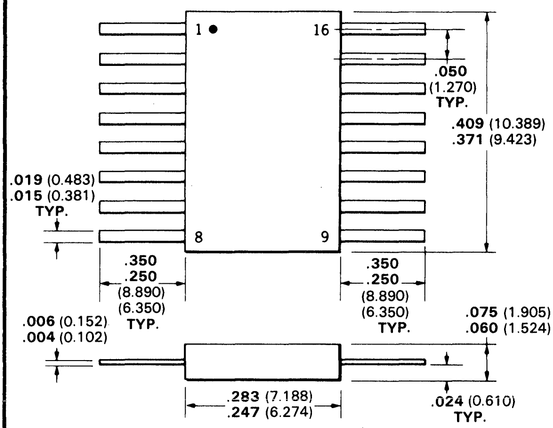


4K

NOTES:
Pins are tin-plated 42 alloy
Package material is plastic
Pins are intended for insertion in hole rows on 400 (10.16) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Cavity size is .220 x .180 (5.59 x 4.57)

All dimensions in inches (bold) and millimeters (parentheses)

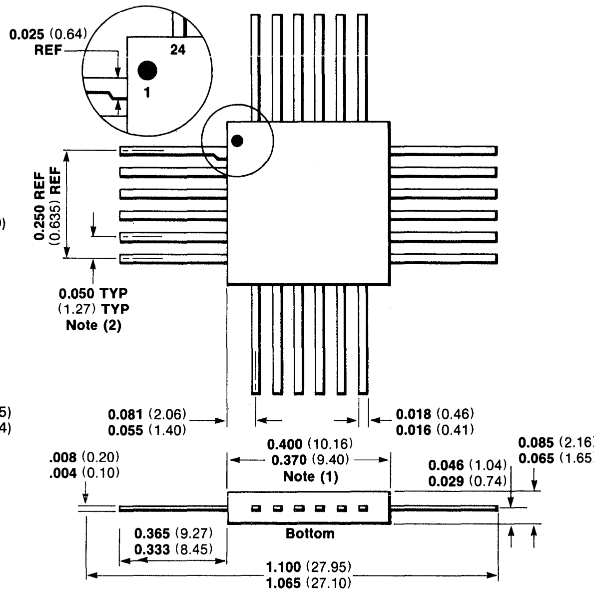
16-PIN BeO CERPAK



4L

NOTES:
Pins are alloy 42
Package weight is 0.4 gram
Hermetically sealed beryllia package

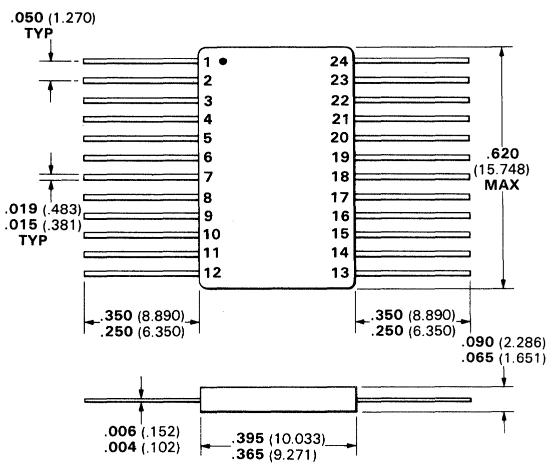
24-PIN FLATPAK



4M

NOTES:
Pins are tin plated nickel alloy
Base is AL203 or BeO
Cavity size is 200 x 200
Package weight is ≈ 0.8 grams

24-PIN CERPAK

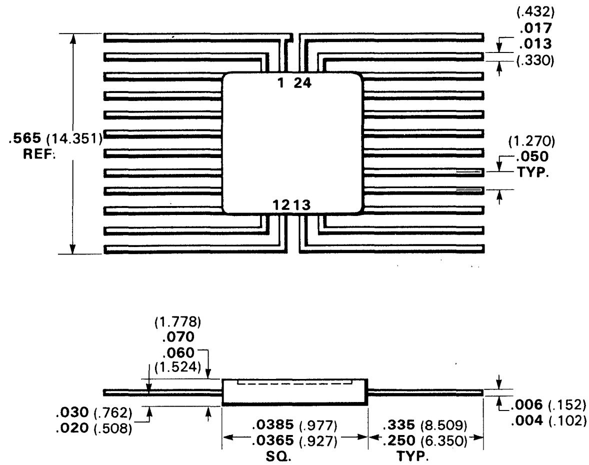


4Q

NOTES:
Pins are alloy 42
Package weight is 0.8 gram
Hermetically sealed beryllia package

All dimensions in inches (bold) and millimeters (parentheses)

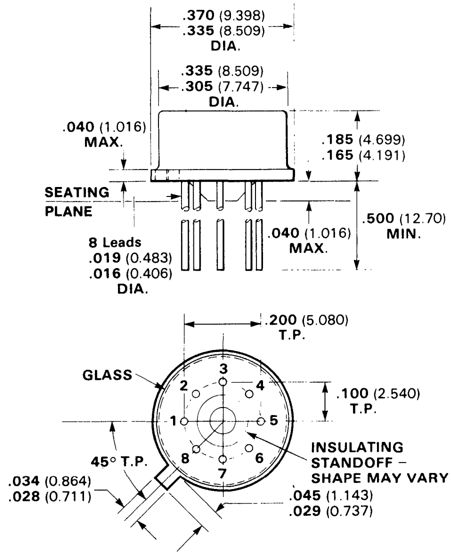
24-PIN FLATPAK



4R

NOTES:
Metal cap and base
Pins are gold plated kovar
Package weight is 0.6 gram

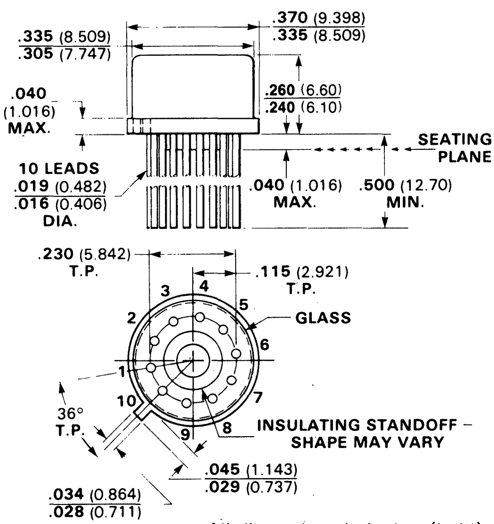
(JEDEC TO-99 OUTLINE)



5B

NOTES:
Leads are gold-plated kovar
Seven leads thru leads No. 4 connected to case
15 mil kovar header
Package weight is 1.22 grams

(JEDEC TO-100 OUTLINE)



5E

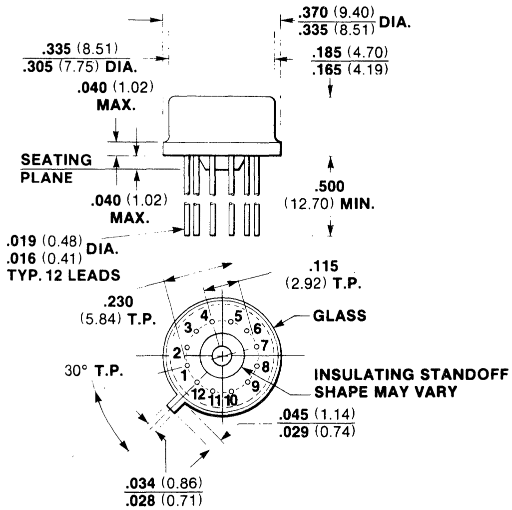
NOTES:
Leads are gold-plated kovar
Ten leads thru
15 mil kovar header
Package weight is 1.32 grams

5F

NOTES:
Leads are gold-plated kovar
Nine leads through, lead 5 connected to case
15 mil kovar header
Package weight is 1.32

All dimensions in inches (bold) and millimeters (parentheses)

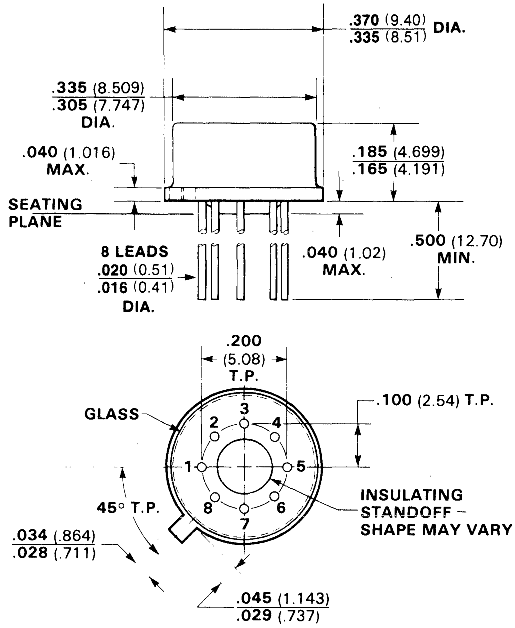
(JEDEC TO-101 OUTLINE)



5G

NOTES:
Leads are gold-plated kovar
Twelve leads thru
15 mil kovar header
Package weight is 1.08 grams

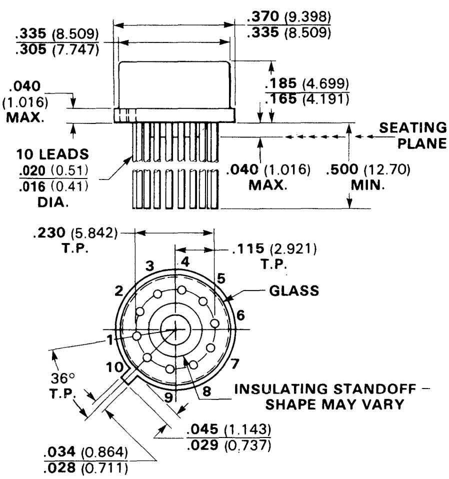
(JEDEC TO-99 OUTLINE)



5S

NOTES:
Leads are solder dipped to seating plane
Seven leads thru, leads No. 4 connected to case
15 mil kovar header
Package weight is 1.22 grams.

(JECEC TO-100 OUTLINE)

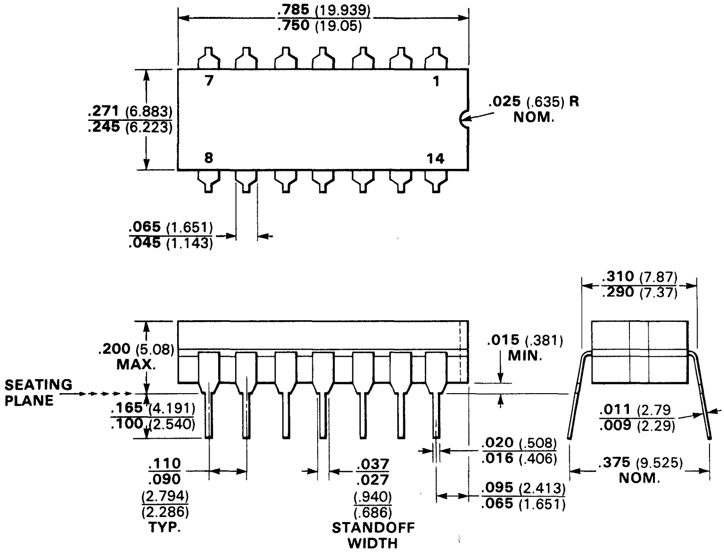


5U

NOTES:
Leads are gold-plated kovar
Ten leads through
High RTH package
15 mil kovar header
Package weight is 1.32 grams

All dimensions in inches (bold) and millimeters (parentheses)

14-PIN HERMETIC DUAL IN-LINE (JEDEC TO-116 OUTLINE)



6A

NOTES:

Pins are intended for insertion in hole rows on .300" (7.620) centers

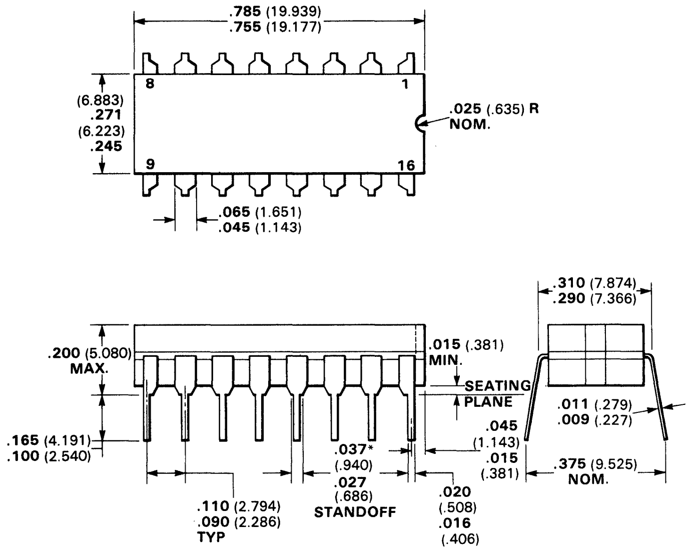
They are purposely shipped with "positive" misalignment to facilitate insertion

Board-drilling dimensions should equal your practice for .020" (0.508) diameter pin

Pins are alloy 42

Package weight is 2.0 grams

16-PIN DUAL IN-LINE



6B

NOTES:

Pins are tin-plated 42 alloy

Pins are intended for insertion in hole rows on .300" centers (7.62)

They are purposely shipped with "positive" misalignment to facilitate insertion

Board-drilling dimensions should equal your practice for .020 inch diameter pin (0.51)

Hermetically sealed alumina package

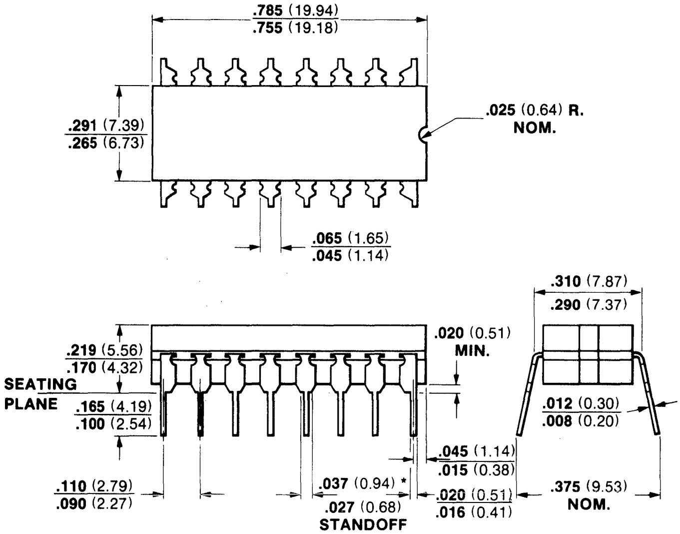
Cavity size is .110 x .140 (2.79 x 3.56)

Package weight is 2.0 grams

*The .037-.027 dimension dies not apply to the corner pins

All dimensions in inches (bold) and millimeters (parentheses)

16-PIN VITREOUS GLASS DUAL IN-LINE



6D

NOTES:

Pins are tin-plated kovar or nickel alloy 42

Pins are intended for insertion in hole rows on .300" (7.62) centers.

They are purposely shipped with "positive" misalignment to facilitate insertion.

Board-drilling dimensions should equal your practice for .030 (0.76) inch diameter pins.

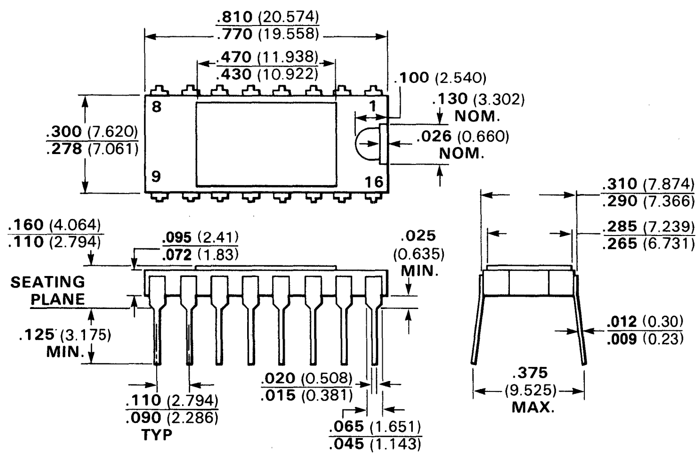
Hermetically sealed alumina package (black).

Cavity size is .130 x .230 (3.30 x 5.84)

*The .037-.027 dimension does not apply to the corner pins.

Package weight is 2.2 grams.

16-PIN DUAL IN-LINE (METAL CAP)



6E

NOTES:

Pins gold-plated nickel alloy 42.

Base is AL203

Cap is kovar

Pins are intended for insertion in hole rows on .300" (7.62) centers. They are purposly shipped with positive misalignment to facilitate insertion.

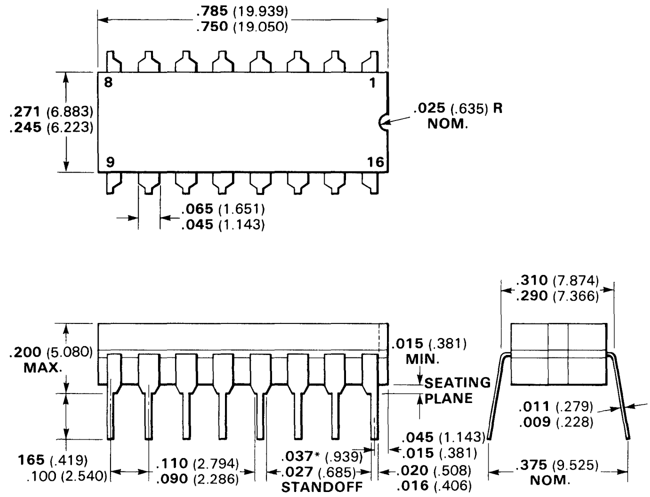
Board-drilling dimensions should equal your practice for .020" (0.51) diameter pin.

Cavity size is .175 x .220 (4.44 x 5.59).

Package weight is 2.0 grams.

All dimensions in inches (bold) and millimeters (parentheses)

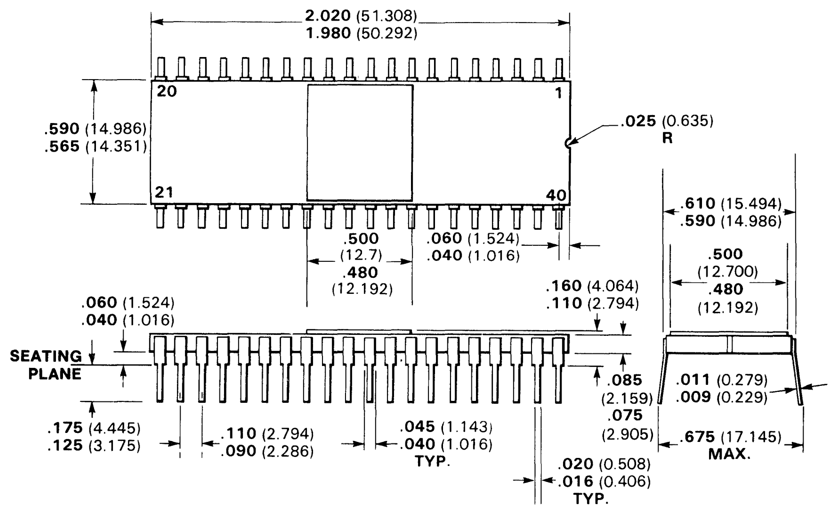
16-PIN DUAL IN-LINE



6F

NOTES:
Pins are tin-plated kovar or nickel alloy 42
Pins are intended for insertion in hole rows on .300" centers (7.62)
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .030 inch diameter pins (0.76)
Hermetically sealed alumina package (black)
Cavity size is .110 x .140 (2.79 x 3.56)
*The .037-.027 dimension does not apply to the corner pins
Package weight is 2.0 grams

40-PIN DUAL IN-LINE SIDE-BRAZED DUAL IN-LINE

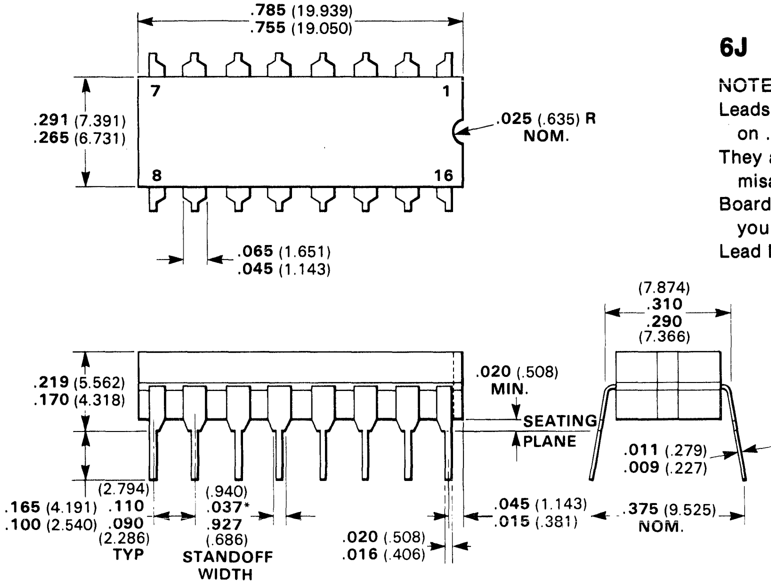


6I

NOTES:
Pin material nickel gold-plated kovar
Cap is kovar
Base is ceramic
Package weight is 6.5 grams

All dimensions in inches (bold) and millimeters (parentheses)

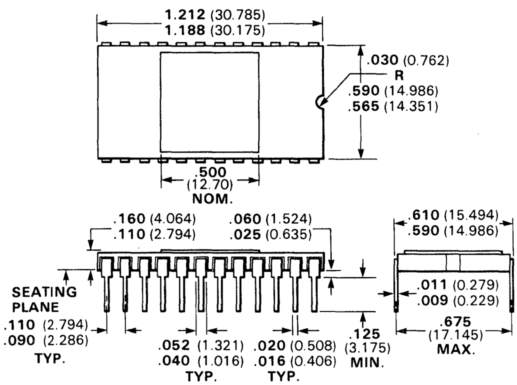
16-PIN DUAL IN-LINE



6J

NOTES:
Leads are intended for insertion in hole rows on .300" centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020 inch diameter lead
Lead No. 4 is internally grounded

24-PIN DUAL IN-LINE SIDE-BRAZED PACKAGE

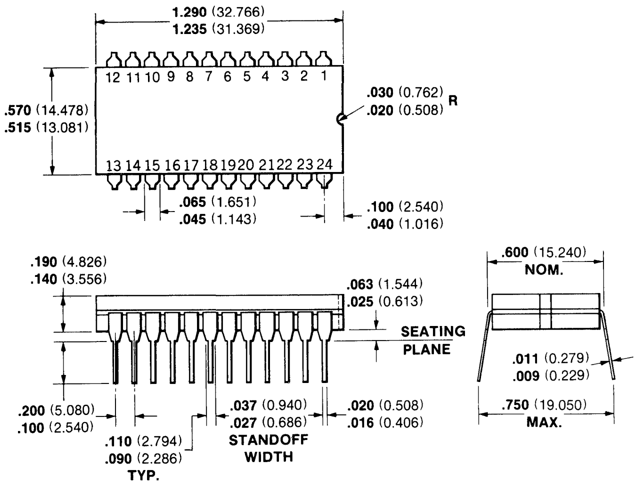


6M

NOTES:
Pins are nickel-gold plated kovar
Cap is gold plated kovar
Base is ceramic
Cavity size is .250" x .250" (6.35 x 6.35)
Board drilling dimensions should equal your practice for .020" (0.50) diameter pin
Pins are intended for insertion in hole rows on .600" (15.24) centers. They are purposely shipped with "positive" misalignment to facilitate insertion
Package weight is 4 grams

All dimensions in inches (bold) and millimeters (parentheses)

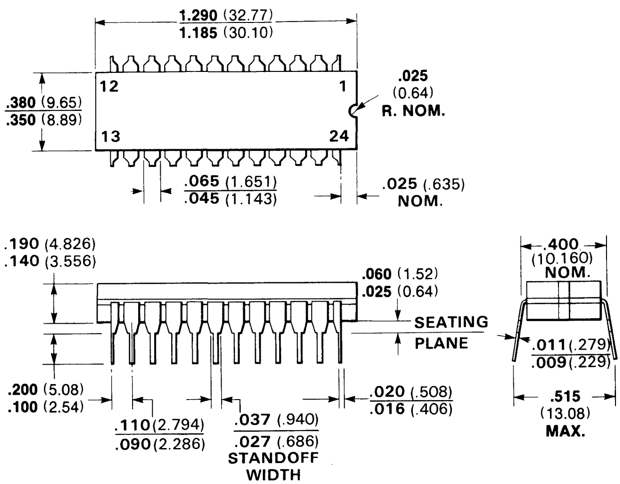
24-PIN DUAL IN-LINE



6N

NOTES:
Pins are tin-plated 42 alloy
Package material is alumina
Pins are intended for insertion in hole rows on .600 (15.24) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Cavity size is .230 x .230 (5.84 x 5.84)
Package weight is 6.5 grams

24-PIN DUAL IN-LINE

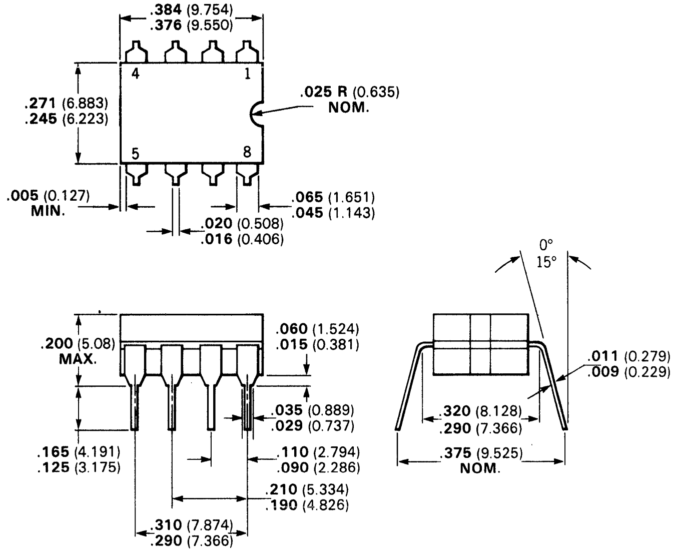


6Q

NOTES:
Pins are tin-plated 42 alloy
Package material is alumina
Pins are intended for insertion in hole rows on .400 (10.16) centers
They are purposely shipped with "positive" misalignment to facilitate insertion.
Cavity size is .195 x .195 (4.95 x 4.95)
Package weight is 6.0 grams

All dimensions in inches (bold) and millimeters (parentheses)

8-PIN DUAL IN-LINE



6T

NOTES:

Pins are tin-plated kovar

Pins are intended for insertion in hole rows on .300" centers

They are purposely shipped with "positive" misalignment to facilitate insertion

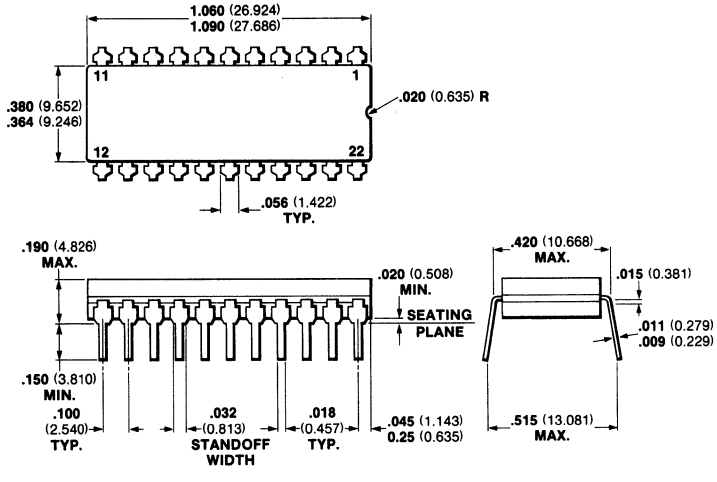
Board-drilling dimensions should equal your practice for .020 inch diameter pin

Hermetically sealed alumina package

Cavity size is .110 x .140

Package weight is 1.0 grams

22-PIN CERAMIC DUAL IN-LINE



6V

NOTES:

Pins are tin-plated 42 alloy

Package material is alumina

Pins are intended for insertion in hole rows on .400 centers

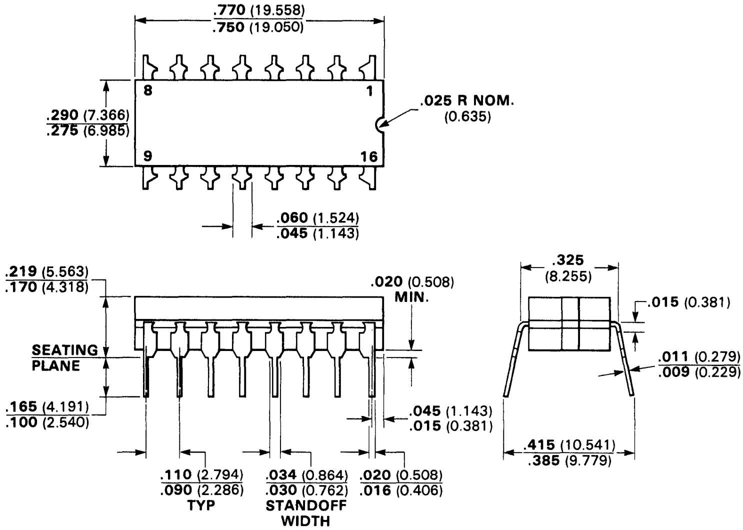
They are purposely shipped with "positive" misalignment to facilitate insertion

Cavity size is .200 x .250 (5.08 x 6.35)

Package weight is 6.0 grams

All dimensions in inches (bold) and millimeters (parentheses)

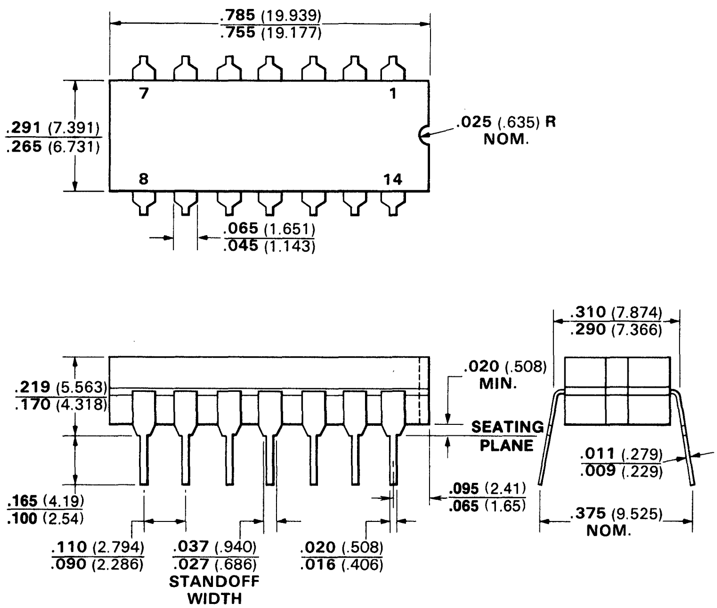
16-PIN DUAL IN-LINE



6Z

NOTES:
Pins are tin-plated kovar
Pins are intended for insertion in hole rows on .300" centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020 inch diameter pin
Hermetically sealed alumina package
Cavity size is .160 x .250
*The .034-.030 dimension does not apply to the corner pins
Package weight is 2.2 grams

14-PIN DUAL IN-LINE (JEDEC TO-116 OUTLINE)



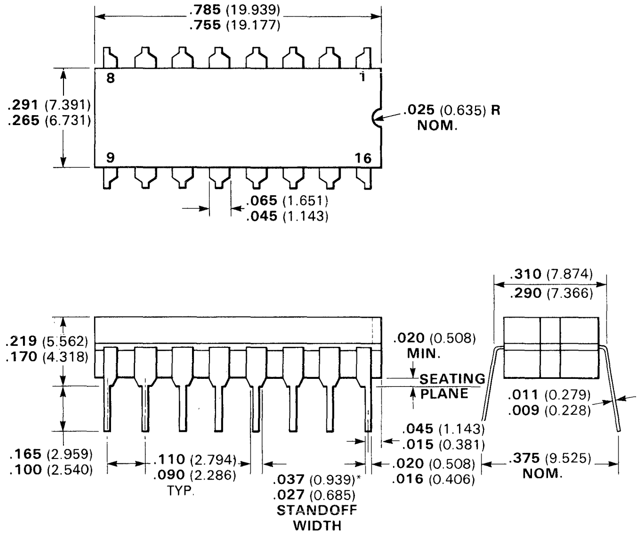
7A

NOTES:
Pins are tin-plated 42 alloy
Pins are intended for insertion in hole rows on .300" (7.62) centers.
They are purposely shipped with "positive" misalignment to facilitate insertion.
Board-drilling dimensions should equal your practice for a conventional .020" (0.51) diameter pin.
Hermetically sealed alumina package.
Cavity size is .130 x .250 (3.30 x 6.35)
*Similar to JEDEC TO-116 except for package width.
Package weight is 2.2 grams.

All dimensions in inches (bold) and millimeters (parentheses)

14

16-PIN DUAL IN-LINE

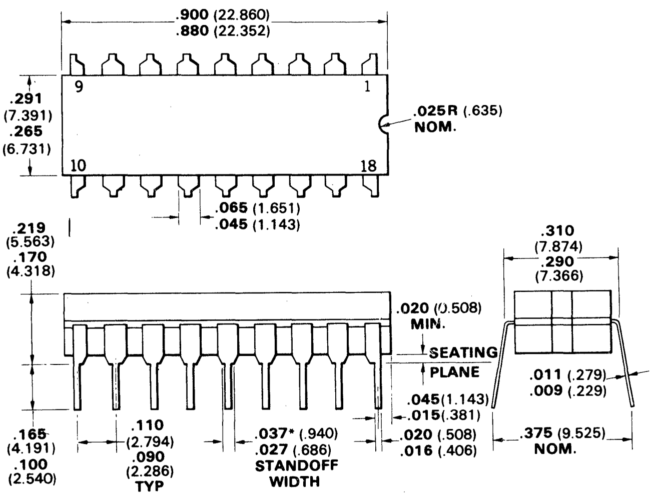


7B

NOTES:

Pins are tin-plated 42 alloy
Pins are intended for insertion in hole rows on .300" (7.62) centers.
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020 (0.51) inch diameter pin
Hermetically sealed alumina package
Cavity size is .130 x .230
*The .037-.027 (0.94-0.69) dimension does not apply to the corner pins
Package weight is 2.2 grams

18-PIN CERAMIC DUAL IN-LINE



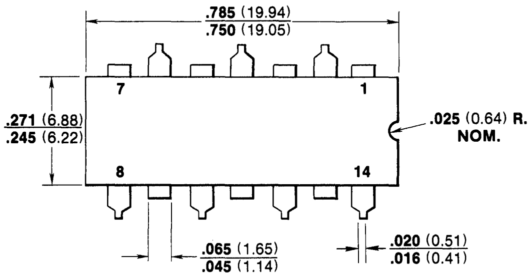
7D

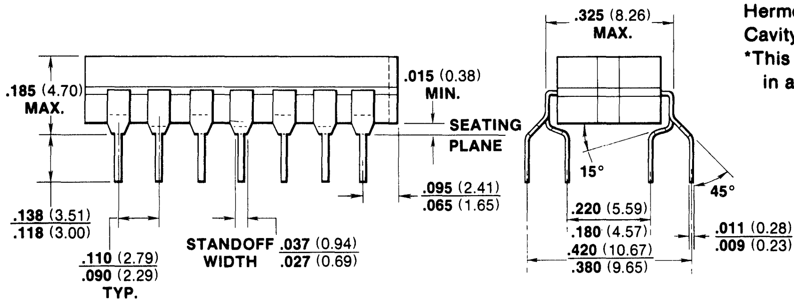
NOTES:

Pins are intended for insertion in hole rows on .300" (7.620) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020 inch (0.508) diameter pin
Pins are alloy 42

All dimensions in inches (bold) and millimeters (parentheses)

14-PIN QUAD IN-LINE (JEDEC TO-116 OUTLINE)*

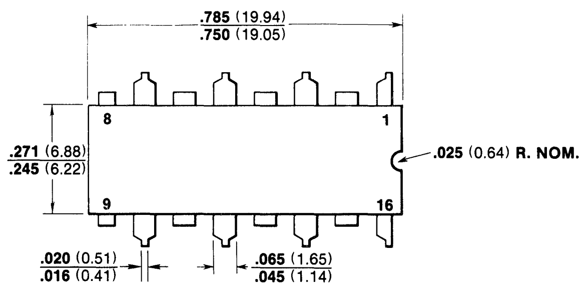


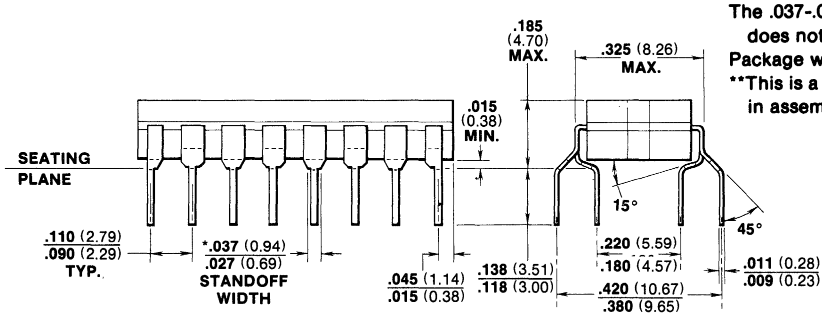


7F

NOTES:
Pins are tin-plated kovar
Board-drilling dimensions should equal your practice for .020 (0.51) inch diameter pin
Hermetically sealed alumina package
Cavity size is .110 x .140 (2.79 x 3.56)
*This is a 6A package with the pins formed in assembly

16-PIN QUAD** IN-LINE



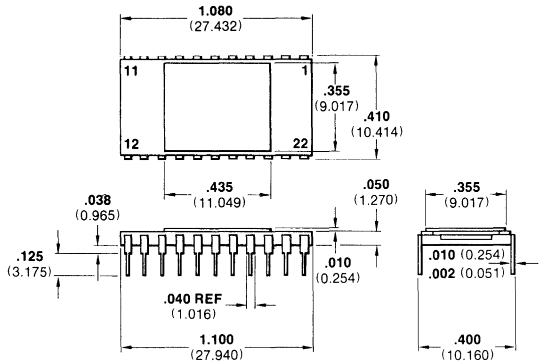


7H

NOTES:
Pins are tin plated kovar
Board-drilling dimensions should equal your practice for .020 (0.51) inch diameter pin
Hermetically sealed alumina package
Cavity size is .110 x .140 (2.79 x 3.56)
The .037-.027 (0.94-0.69) dimension does not apply to the corner pins
Package weight is 2.0 grams.
**This is a 6B package with the pins formed in assembly.

All dimensions in inches (bold) and millimeters (parentheses)

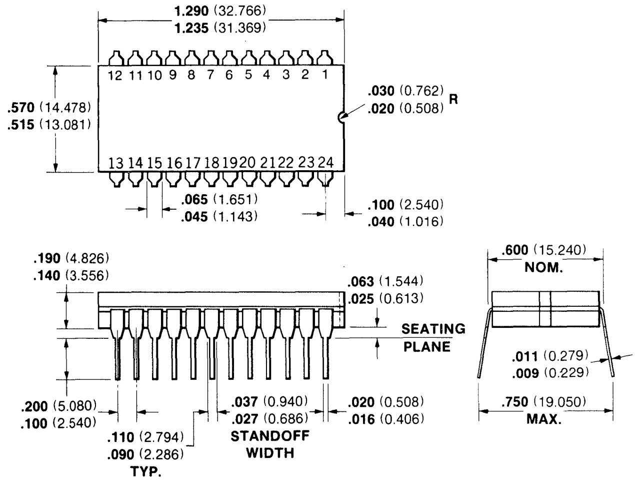
22-PIN SIDE-BRAZED (METAL CAP)



7I

NOTES:
Pins are Au-plated kovar
Cap is kovar
Base is ceramic
Cavity size .220 x .250 (5.588 x 6.35)
Package weight is 4.0 grams

24-PIN VITREOUS GLASS CERDIP (MSI)



7L

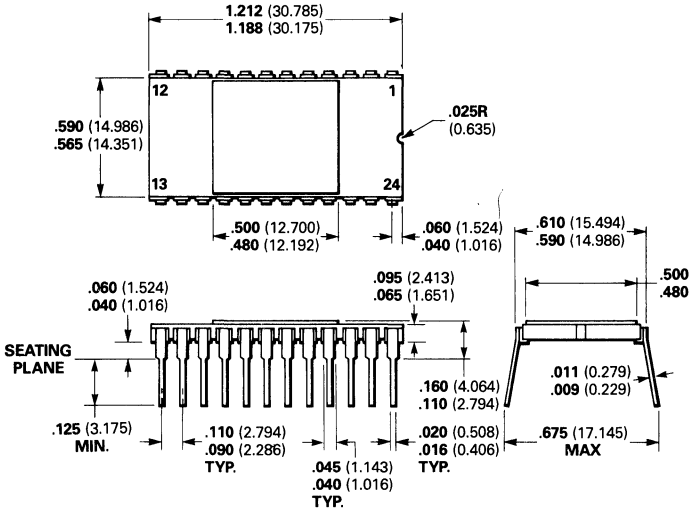
NOTES:
Pins are tin-plated 42 alloy
Package material is alumina
Pins are intended for insertion in hole rows on .600 (15.24) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Cavity size is .230 x .230 (5.84 x 5.84)
Package weight is 6.5 grams

7M

NOTES:
Pins are tin-plated alloy 42
Package material is alumina
Pins are intended for insertion in hole rows on .600 (15.24) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Cavity size is .245 x .245
Package weight is 6.5 grams

All dimensions in inches (bold) and millimeters (parentheses)

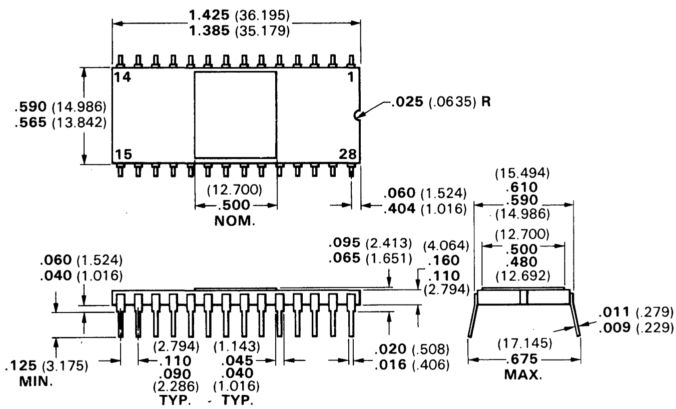
24-PIN SIDE-BRAZED PACKAGE DUAL IN-LINE



7R

NOTES:
Pins are nickel gold-plated kovar
Cap is kovar
Base is ceramic
Cavity size is .250 x .250 (6.35 x 6.35)

28-PIN CERAMIC DUAL IN-LINE

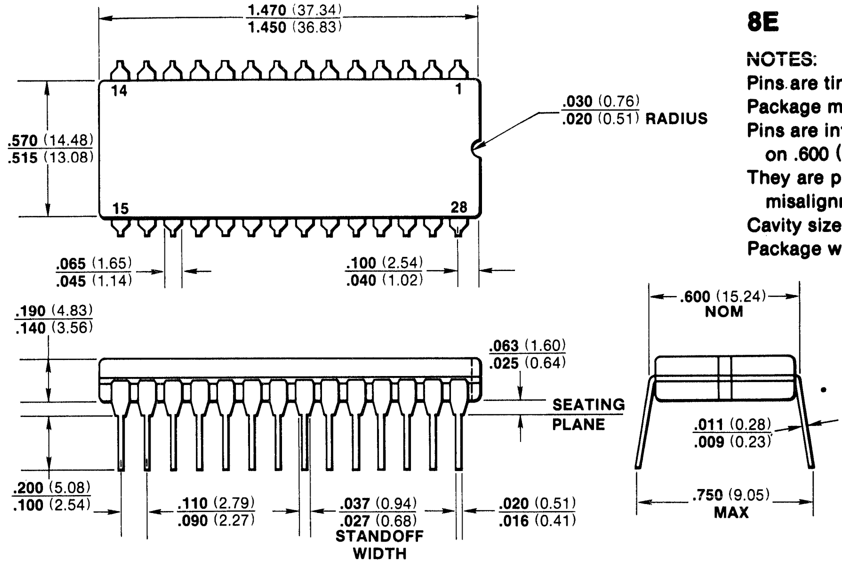


7Y

NOTES:
Pins are gold-plated kovar
Package material is ceramic
Cavity size is .250 x .250 (6.35 x 6.35)
Package weight is 4.0 grams

All dimensions in inches (bold) and millimeters (parentheses)

28-PIN DUAL IN-LINE SIDE-BRAZED

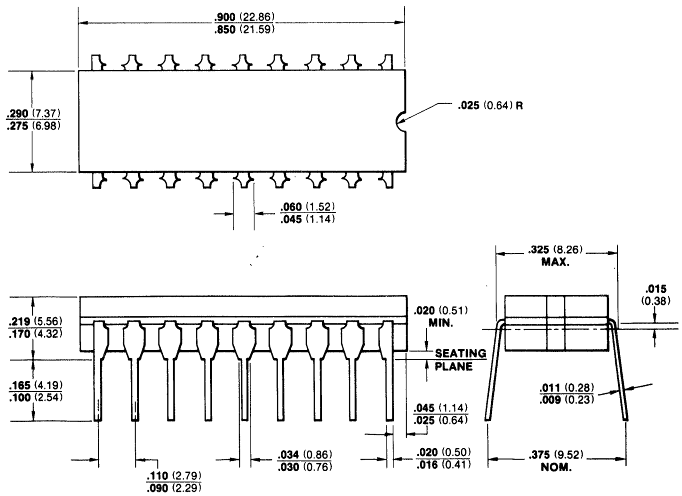


8E

NOTES:

Pins are tin-plated alloy 42
Package material is alumina
Pins are intended for insertion in hole rows on .600 (15.24) centers.
They are purposely shipped with "positive" misalignment to facilitate insertion.
Cavity size is .240 (6.096) x .240 (6.096)
Package weight is 7.5 grams

18-PIN CERAMIC DUAL IN-LINE



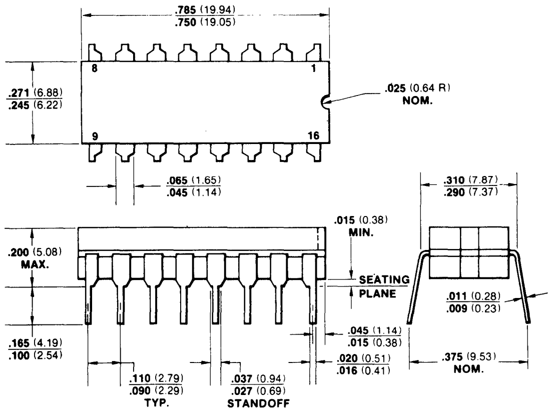
8F

NOTES:

Pins are tin-plated kovar
Pins are intended for insertion in hole rows on .300" (7.62) centers.
They are purposely shipped with "positive" misalignment to facilitate insertion.
Board-drilling dimensions should equal your practice for .020 (.508) inch diameter pin.
Hermetically sealed alumina package.
Cavity size is .160 (4.064) x .250 (6.35).
*The .034-.030 dimension does not apply to the corner pins.
Package weight is 3.0 grams.

All dimensions in inches (bold) and millimeters (parentheses)

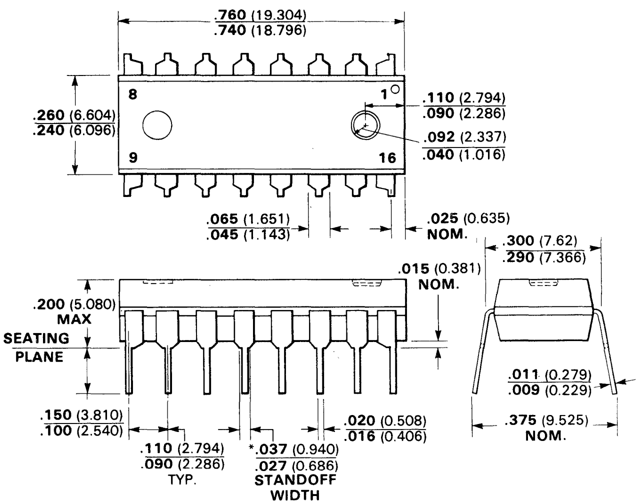
16-PIN CERAMIC DUAL IN-LINE



8I

NOTES:
Pins are tin-plated 42 alloy
Pins are intended for insertion in hole rows on .300" (7.62) centers.
They are purposely shipped with "positive" misalignment to facilitate insertion.
Board-drilling dimensions should equal your practice of .020 (0.51) inch diameter pin.
Hermetically sealed alumina package.
*This dimension does not apply to the corner pin
Package weight is 2.0 grams.

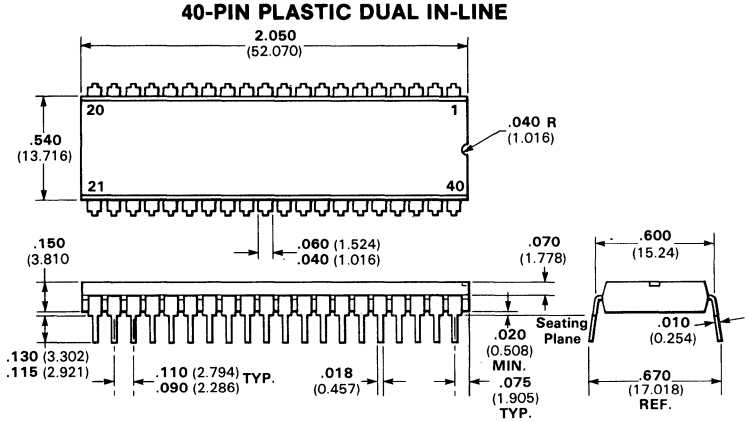
16-PIN PLASTIC DUAL IN-LINE



8K

NOTES:
Pins are tin-plated kovar or alloy 42 nickel
*Package material varies depending on the product line
Pins are intended for insertion in hole rows on .300" (7.62) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020" (0.51) diameter pin
***The .037-.027 (0.94-0.69) dimension does not apply to the corner leads
**Notch or ejector hole varies depending on the product line
Package weight is 0.9 gram

40-PIN PLASTIC DUAL IN-LINE



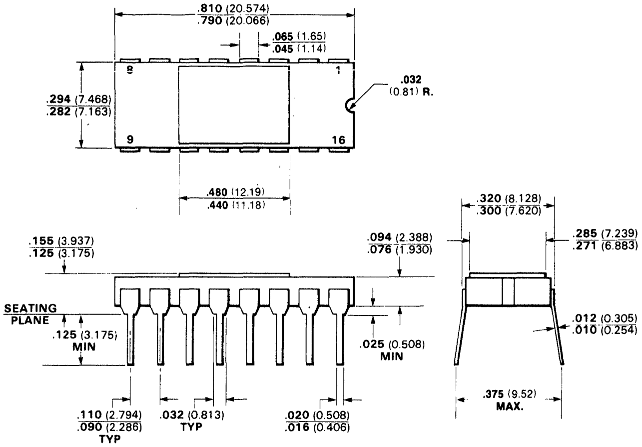
8P

NOTES:
Pins are tin-platd kovar
Package material is plastic
Pins are intended for insertion in hole rows on .600 centers
They are purposely shipped with positive misalignment to facilitate insertion.
Weight: 7 grams

All dimensions in inches (bold) and millimeters (parentheses)

14

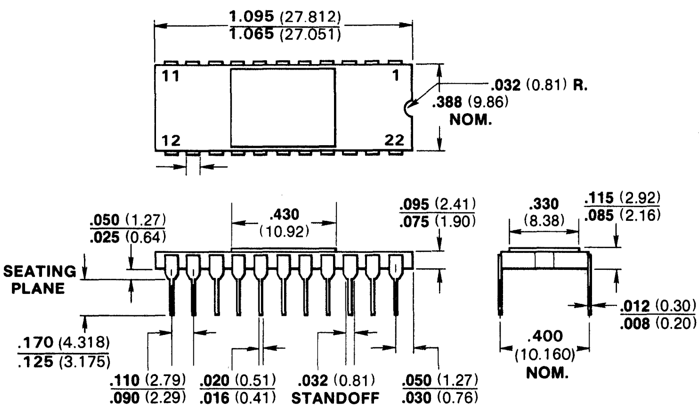
16-PIN DUAL IN-LINE (METAL CAP)



8R

NOTES:
Pins gold-plated kovar
Base is AL203, dark ceramic
Cap is kovar
Pins are intended for insertion in hole rows on .300" centers. They are purposely (7.62) shipped with positive misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020" diameter pin (5.08)
Cavity size is .175 x .240 (4.44 x 6.10)

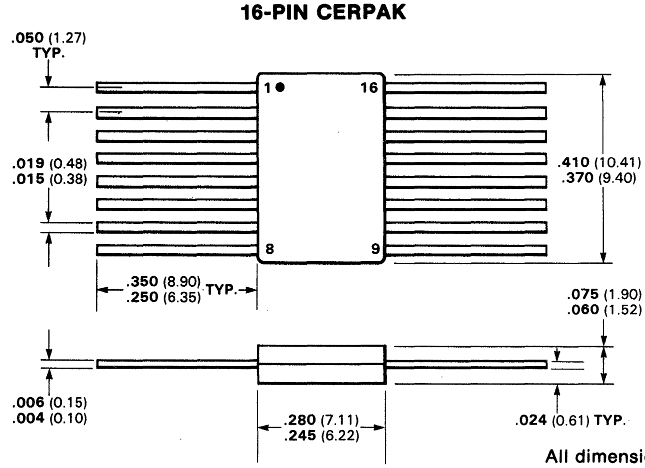
22-PIN DUAL IN-LINE (METAL CAP)



8T

NOTES:
Pins are gold-plated kovar
Package material is alumina (white)
Pins are intended for insertion in hole rows on .400" centers. (10.16)
They are purposely shipped "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .030 inch diameter pin (0.76)
Low temperature seal
Cavity size is .200 square (5.08)
Weight is 2.0 grams.

16-PIN CERPAK

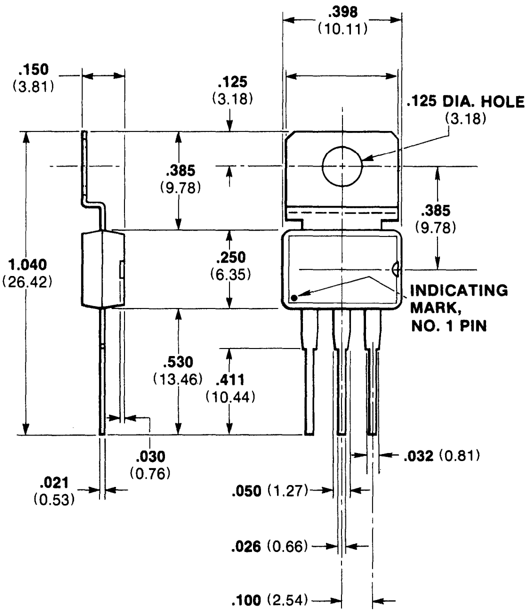


8U

NOTES:
Pins are tin-plated 42 alloy
Cap and base are alumina
Cavity size is .140 x .200, (3.556 x 5.08) silver plated
Package weight is 0.4 gram

All dimensions in inches (bold) and millimeters (parentheses)

3-PIN SINGLE SIDE POWER PLASTIC MINIDIP

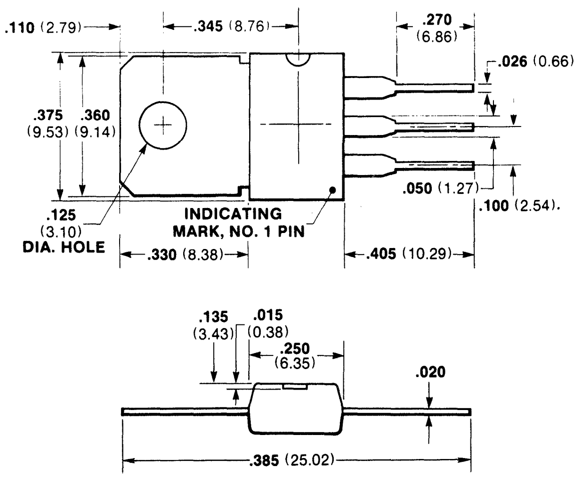


8Y (U-1)

NOTES:

Pins are tin plated copper
Package weight is 0.6 gram
Package material is plastic
Tab is electrically insulated from pins
This package is intended to be mounted with the tab flush with the top of the P.C. board or heat sink. A No. 4 screw may be used to secure the package. Thermal compound is recommended.
All dimensions nominal.

3-PIN SINGLE SIDE POWER PLASTIC MINIDIP



8Y (U-2)

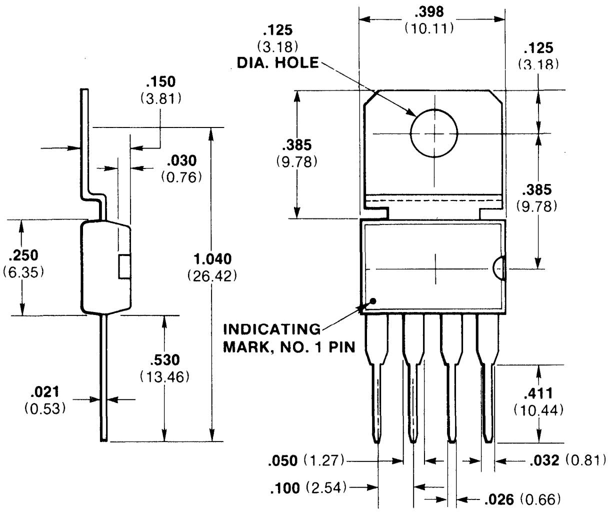
NOTES:

Package is plastic with tin-plated copper leads
Package weight is 0.6 gram
Center lead is electrical contact with mounting tab
For detailed package configuration, refer to FSB-90717

All dimensions in inches (bold) and millimeters (parentheses)

14

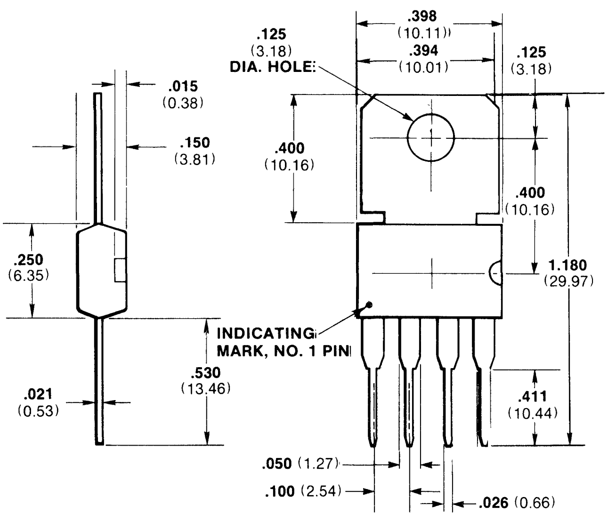
4-PIN SINGLE SIDE POWER PLASTIC MINIDIP



8Z (U-1)

NOTES:
- Package is plastic with tin-plated copper pins
- Board-drilling dimensions should equal your practice for .033 (0.84) inch diameter pins
- Package weight is 0.6 gram
- Tab is electrically insulated from pins
- This package is intended to be mounted with the tab flush with the top of the PC board or heat sink. A No. 4 screw may be used to secure the package. Thermal compound is recommended.

4-PIN SINGLE SIDE POWER PLASTIC MINIDIP

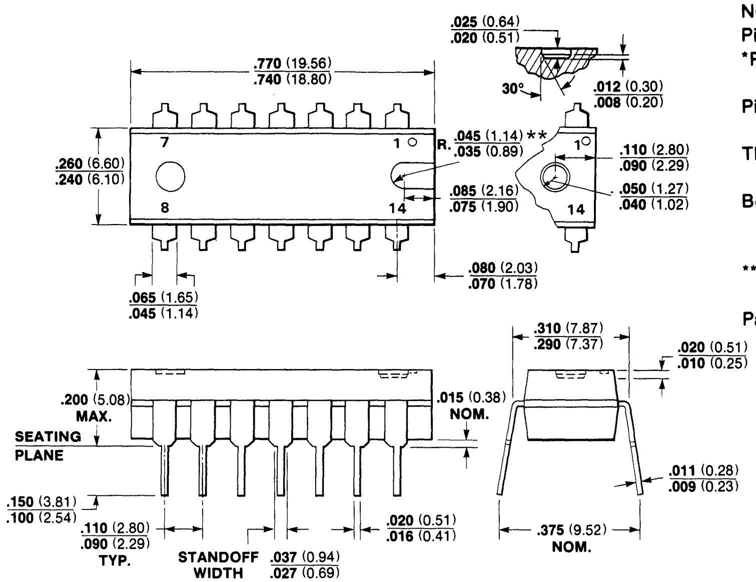


8Z (U-2)

NOTES:
- Package is plastic with tin-plated pins
- Board-drilling dimensions should equal your practice for .033 (0.84) inch diameter pin
- Package weight is 0.6 gram
- Tab is electrically insulated from pins

All dimensions in inches (bold) and millimeters (parentheses)

14-PIN *PLASTIC DUAL IN-LINE (JEDEC TO-116 OUTLINE)



9A

NOTES:

Pins are tin plated kovar

*Package material varies depending on the product line

Pins are intended for insertion in hole rows on .300" (7.62) centers

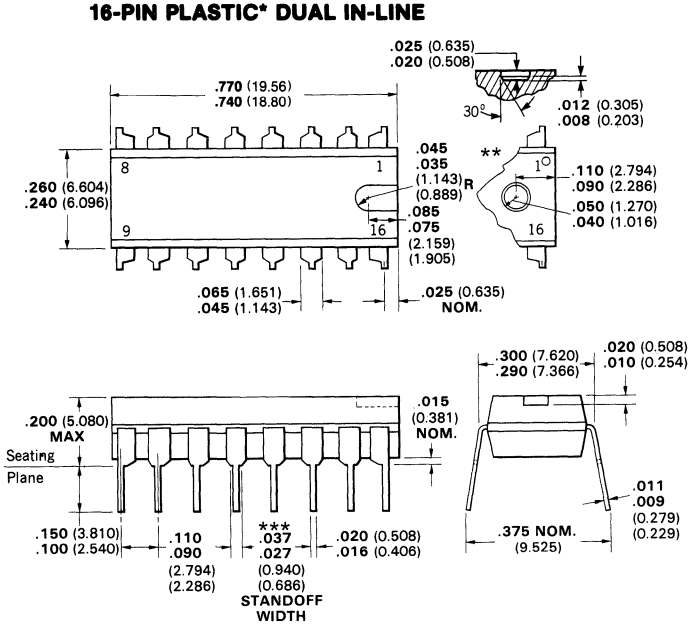
They are purposely shipped with "positive" misalignment to facilitate insertion

Board-drilling dimensions should equal your practice for .020 (0.508) inch diameter pin

**Notch or ejector hole varies depending on the product line

Package weight is 0.9 gram

16-PIN PLASTIC* DUAL IN-LINE



9B

NOTES:

Pins are tin-plated kovar or alloy 42 nickel.

Pins are intended for insertion in hole rows on .300" (7.62) centers

Leads purposely have a "positive" misalignment to facilitate insertion

Board-drilling dimensions should equal your practice for .020 inch (0.51) diameter pin.

Package weight is 0.9 gram

*Package material varies depending on the product line

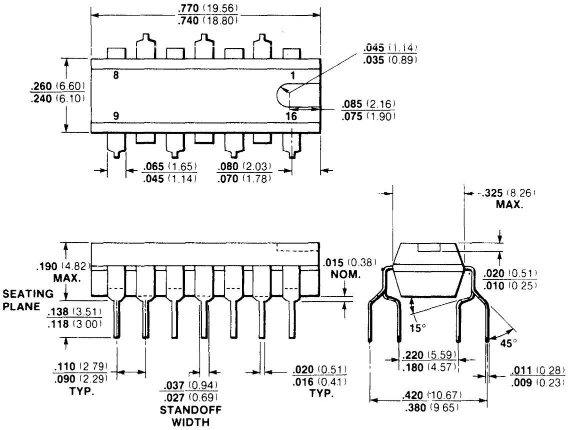
***The .037-.027 (0.94-0.69) dimension does not apply to the corner pins.

**Notch or ejector hole varies depending on the product line

All dimensions in inches (bold) and millimeters (parentheses)

14

14-PIN PLASTIC QUAD IN-LINE (JEDEC TO-116 OUTLINE*)



9C

NOTES:

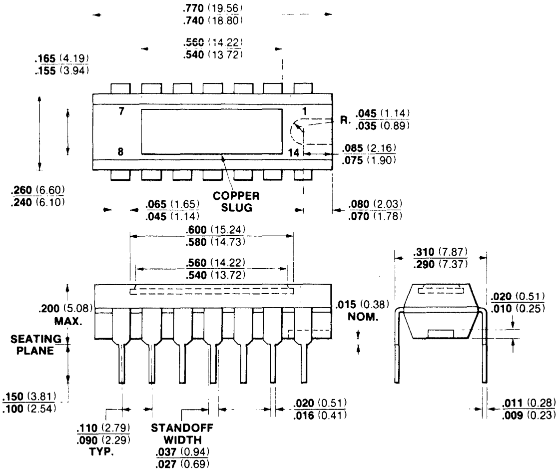
Package is epoxy with tin-plated kovar pins

Board-drilling dimensions should equal your practice for .020 (0.51) inch diameter pin

Package weight is 0.9 gram

*This is a 9A package with the pins formed in assembly. Only the notched and epoxy version is used

14-PIN PLASTIC DUAL IN-LINE (WITH COPPER SLUG)



9H

NOTES:

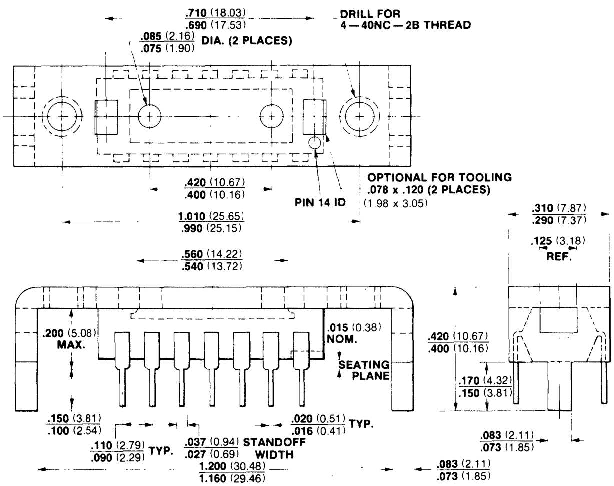
Leads are gold-plated kovar

Board-drilling dimensions should equal your practice for .020 (0.51) inch diameter lead

Package material is epoxy with copper slug

Package weight is 0.9 gram

14-PIN PLASTIC DUAL IN-LINE (COPPER SLUG AND HEAT BRACKET)*



9J

NOTES:

Pins are gold-plated kovar

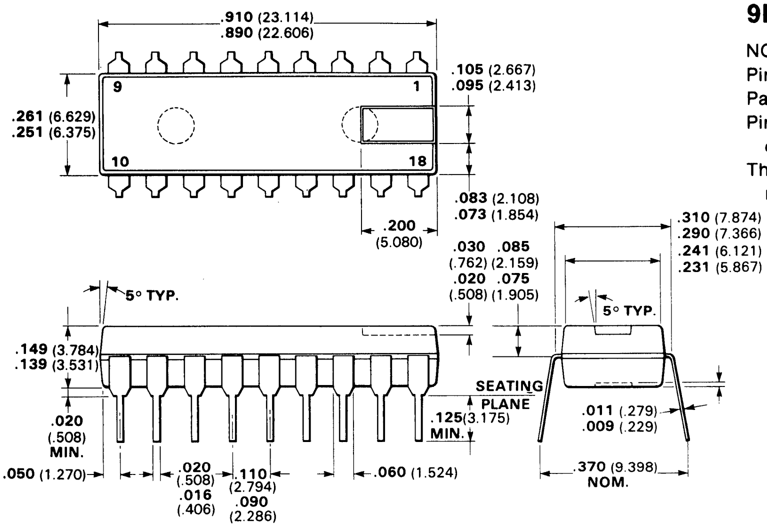
Package material is epoxy with copper slug and tin-plated copper bracket

Board-drilling dimensions should equal your practice for .020 (0.51) diameter pin

*Package is the same as 9H except that a heat bracket is attached

All dimensions in inches (bold) and millimeters (parentheses)

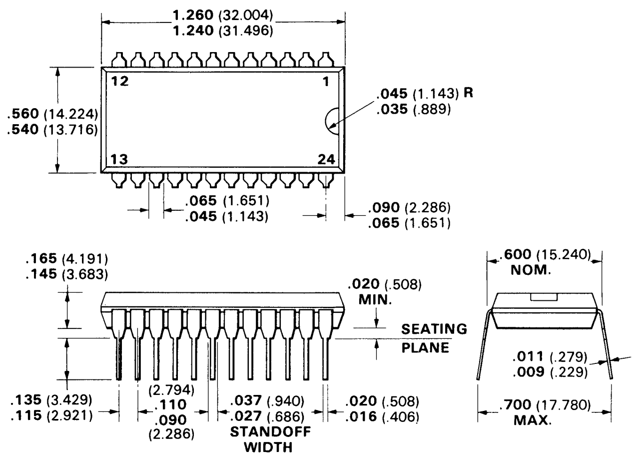
18-PIN PLASTIC DUAL IN-LINE



9M

NOTES:
Pins are tin-plated kovar
Package material is plastic
Pins are intended for insertion in hole rows on .300 (7.62) centers
They are purposely shipped with "positive" misalignment to facilitate insertion

24-PIN PLASTIC DUAL IN-LINE



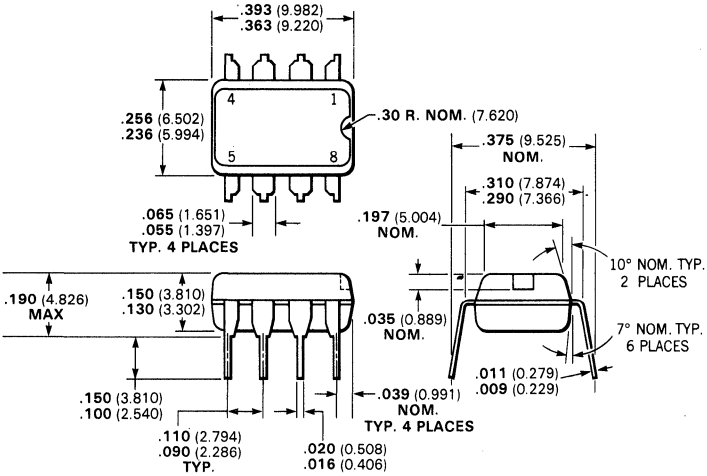
9N

NOTES:
All dimensions in inches (bold) and millimeters (parentheses)
Pins are tin-plated kovar
Package material is plastic
Pins are intended for insertion in hole rows on .600 (15.24)
They are purposely shipped with positive misalignment to facilitate insertion

All dimensions in inches (bold) and millimeters (parentheses)

14

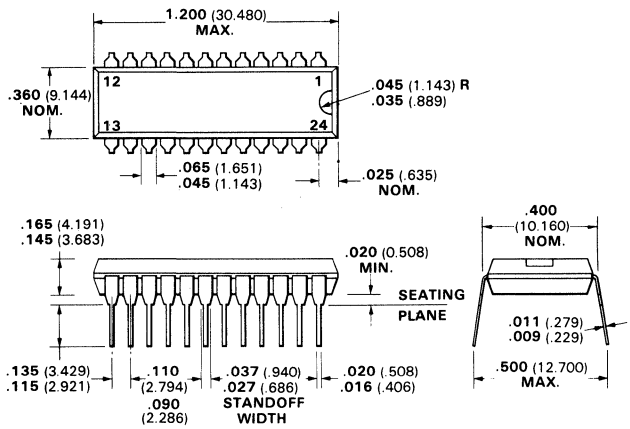
8-PIN PLASTIC DUAL IN-LINE



9T

NOTES:
Pins are tin or gold-plated kovar
Package material is plastic
Pins are intended for insertion in hole rows on .300" (7.62) centers
They are purposely shipped with "positive" misalignment to facilitate insertion
Board-drilling dimensions should equal your practice for .020 (0.51) inch diameter pin
Package weight is 0.6 gram

24-PIN PLASTIC DUAL IN-LINE

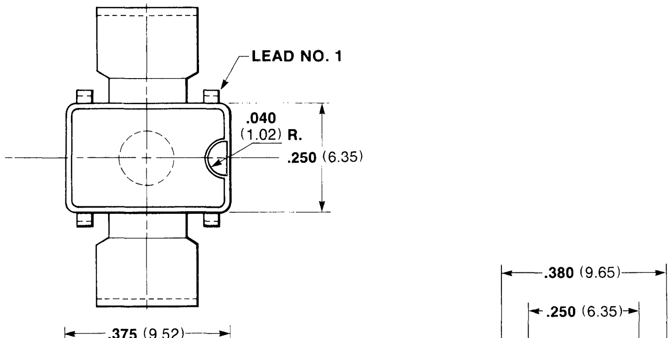


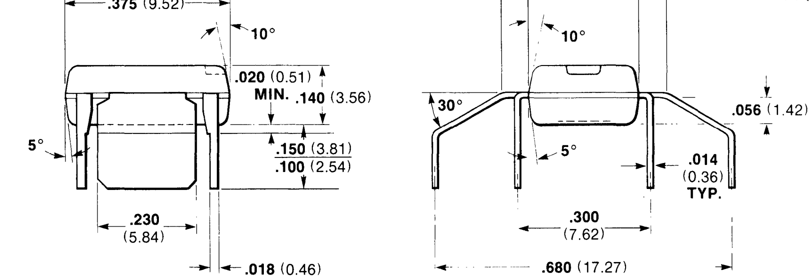
9U

NOTES:
All dimensions in inches (bold) and millimeters in (parentheses)
Pins are tin-plated 42 alloy
Package material is plastic
Pins are intended for insertion in hole rows on .400 (10.16) centers.
They are purposely shipped with positive misalignment to facilitate insertion.

All dimensions in inches (bold) and millimeters (parentheses)

4-PIN POWER MINIDIP





9V (T1)

NOTES:

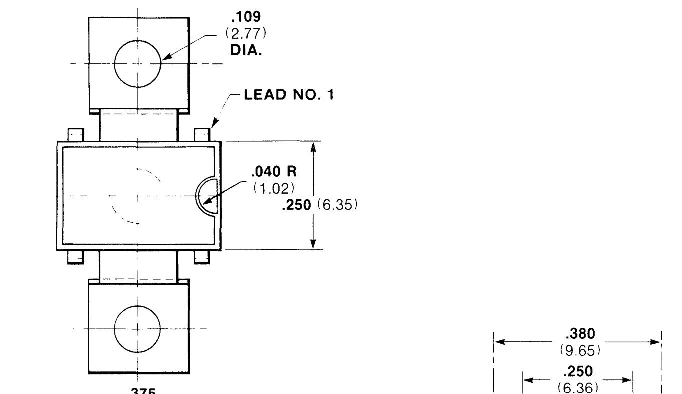
Package is plastic with tin-plated copper leads

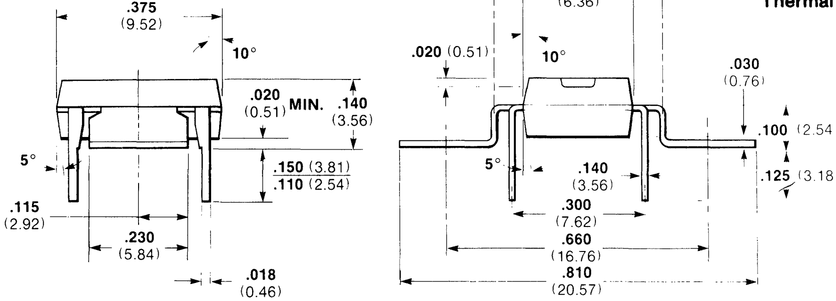
For detailed package configuration refer to FSD-90669

Package weight is 0.6 gram

T-1 package can be soldered to the PC board through .0230" x .020 (0.584 x 0.51) slots. Double or single-sided boards may be used.

4-PIN POWER MINIDIP





9V (T2)

NOTES:

Package is plastic with tin-plated copper pins and wings

For detailed package configuration refer to FSD-90670.

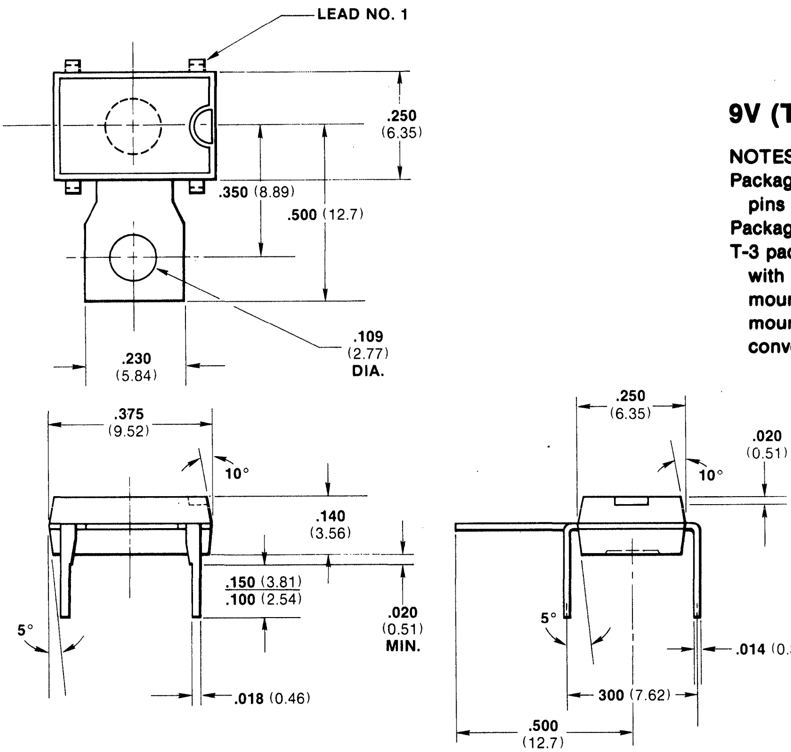
Package weight is 0.6 gram

T-2 package is intended to be mounted with the tabs flush with the top of the PC board. Either No. 2-56 screws or No. 2 rivets may be used to secure the package. Single or double-sided PC boards may be used. Thermal compound is recommended.

All dimensions in inches (bold) and millimeters (parentheses)

14

4-PIN POWER MINIDIP



9V (T3)

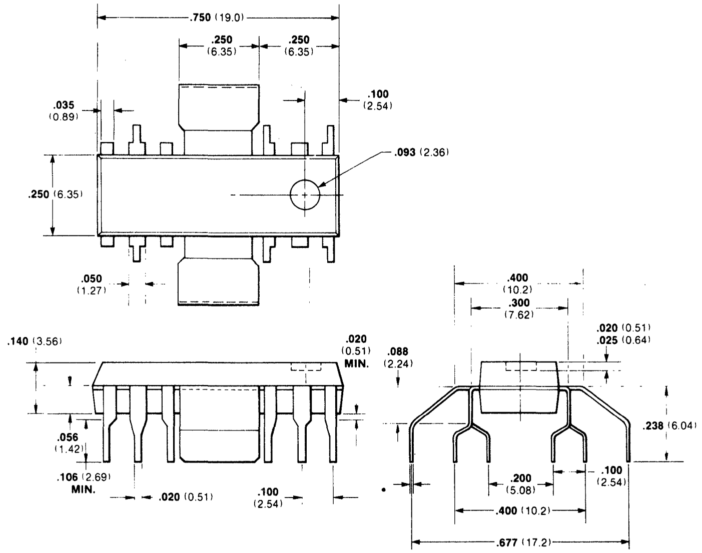
NOTES:

Package is plastic with tin-plated copper pins and wings

Package weight is 0.6 gram

T-3 package is intended for applications with an external heat sink. A No. 2 mounting hole is provided for case of mounting. The tab may be bent to any convenient angle.

12-PIN POWER PLASTIC DUAL IN-LINE



9W (P3)

NOTES:

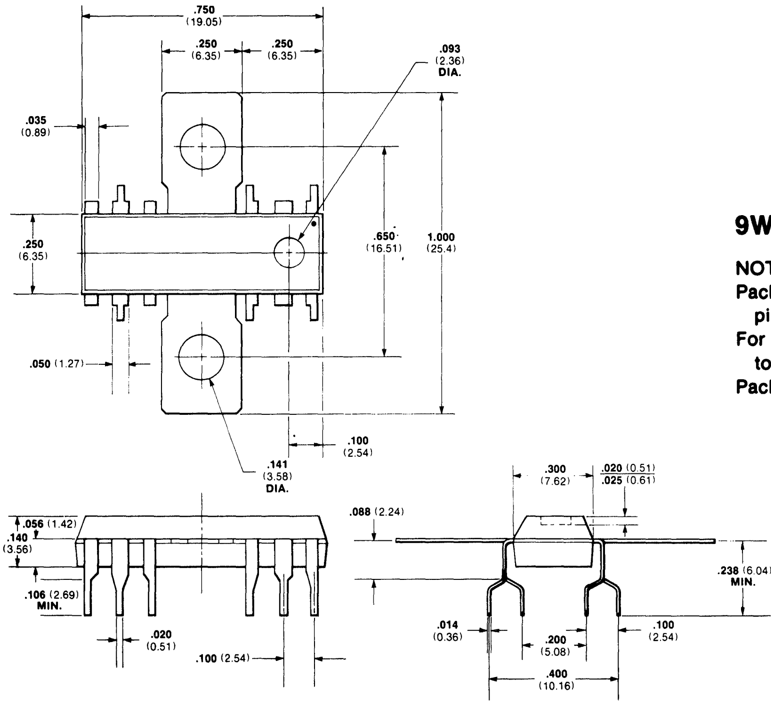
Package is plastic with tin plated copper pins and wings

For detailed package configuration refer to FSB-90698

Package weight is 0.9 gram

All dimensions in inches (bold) and millimeters (parentheses)

12-PIN POWER PLASTIC DUAL IN-LINE



9W (P4)

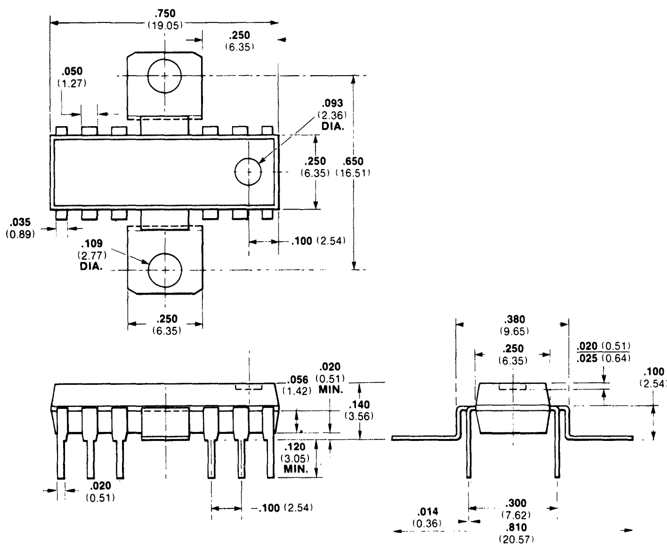
NOTES:

Package is plastic with tin-plated copper pins and wings

For detailed package configuration refer to FSB-90699

Package weight is 0.9 gram

12-PIN POWER PLASTIC DUAL IN-LINE



9W (P5)

NOTES:

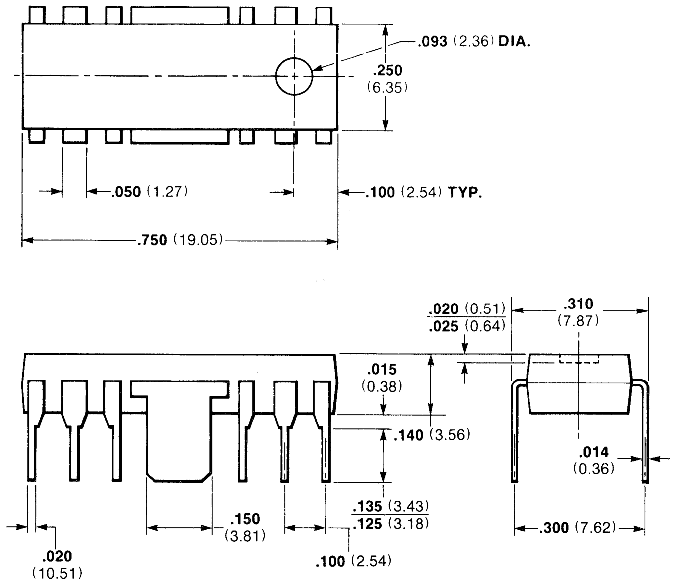
Package is plastic with tin-plated copper pins and wings

For detailed package configuration refer to FSD-90740.

Package weight is 0.9 gram

All dimensions in inches (bold) and millimeters (parentheses)

12-PIN POWER PLASTIC DUAL IN-LINE



9W (P6)

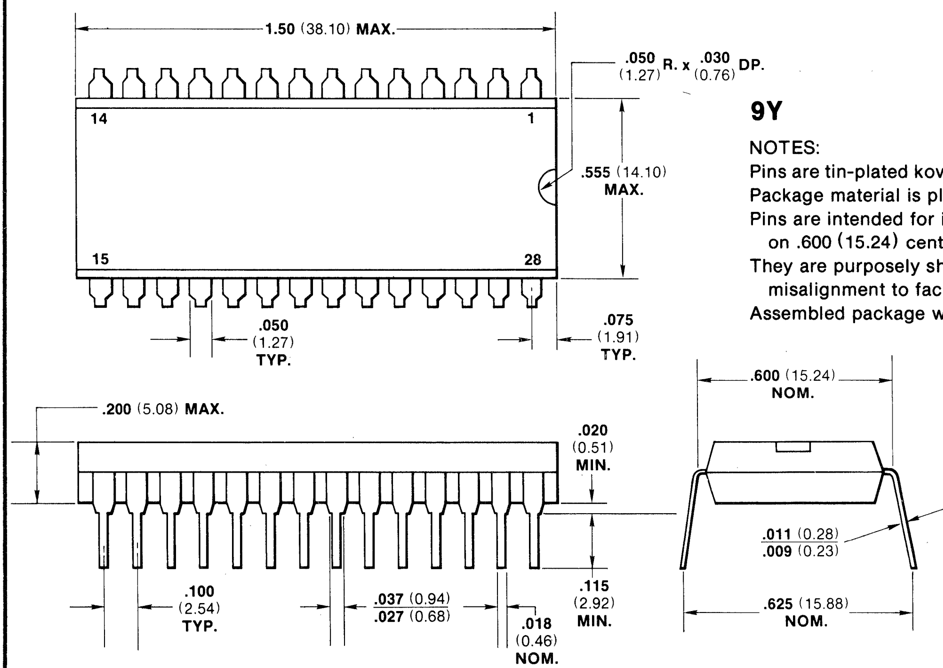
NOTES:

Package is plastic with tin plated copper pins and wings

For detailed package configuration refer to FSB-90126

Package weight is 0.9 gram

28-PIN PLASTIC DUAL IN-LINE



9Y

NOTES:

Pins are tin-plated kovar, alloy 42 or copper

Package material is plastic

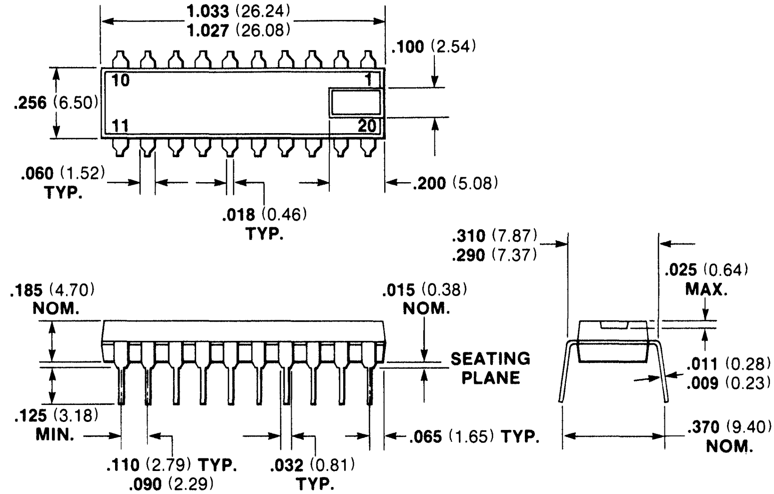
Pins are intended for insertion in hole rows on .600 (15.24) centers

They are purposely shipped positive misalignment to facilitate insertion

Assembled package weight 4.8 grams

All dimensions in inches (bold) and millimeters (parentheses)

20-PIN PLASTIC DUAL IN-LINE



9Z

NOTES:

Pins are tin plated alloy 42 or copper (olin 195)

Package material varies depending on the product line

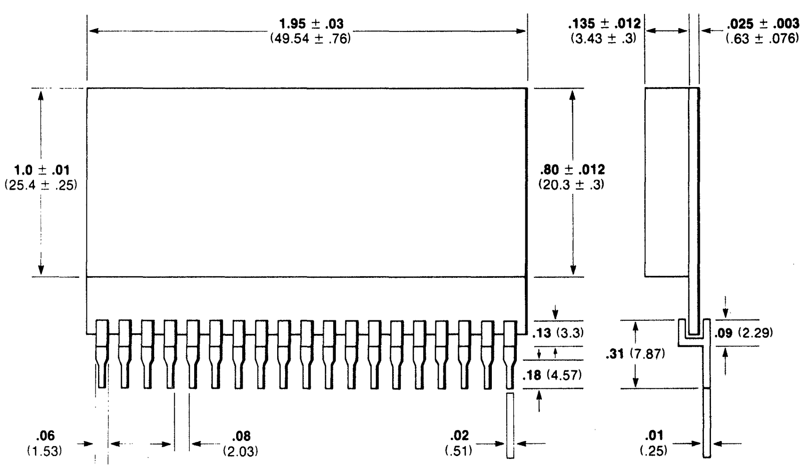
Pins are intended for insertion in hole rows on .300 (7.62) centers

They are purposely shipped with "positive" misalignment to facilitate insertion

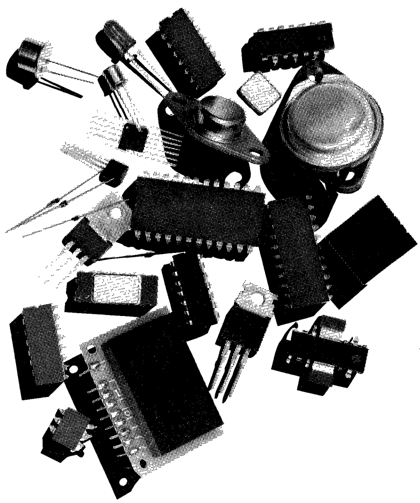
Board drilling dimensions should equal your practice for .020" (0.51) diameter pin

Package weight is a little over 1.0 grams

19-PIN SINGLE IN-LINE



All dimensions in inches (bold) and millimeters (parentheses)



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Livonia, Michigan 48150
Tel: 313-525-1800

SCHWEBER ELECTRONICS
33540 Schoolcraft
Livonia, Michigan 48150
Tel: 313-525-8100

SHERIDAN SALES CO.
24543 Indoplex Drive
(P.O. Box 529)
Farmington, Mich. 48024
Tel: 313-477-3800

MINNESOTA
HAMILTON/AVNET ELECTRONICS
7683 Washington Ave. South
Edina, Minnesota 55435
Tel: 612-941-3801
TWX: None — use 910-227-0060
(Regional Hq. in Chicago, Ill.)

SCHWEBER ELECTRONICS
7402 Washington Ave. South
Eden Prairie, Minnesota 55343
Tel: 612-941-5280

SEMICONDUCTOR SPECIALISTS, INC.
8030 Cedar Avenue South
Minneapolis, Minnesota 55420
Tel: 612-854-8841 TWX: 910-576-2812

MISSOURI
HALLMARK ELECTRONICS, INC.
13789 Rider Trail
Earth City, Missouri 63045
Tel: 314-291-5350

HAMILTON/AVNET ELECTRONICS
364 Brookes Lane
Hazelwood, Missouri 63042
Tel: 314-731-1144 TWX: 910-762-0606

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HAMILTON/AVNET ELECTRONICS
218 Little Falls Road
Cedar Grove, New Jersey 07009
Tel: 201-239-0800 TWX: 710-994-5787

HAMILTON/AVNET ELECTRONICS
113 Gaither Drive
East Gate Industrial Park
Mt. Laurel, N.J. 08057
Tel: 609-234-2133 TWX: 710-897-1405

SCHWEBER ELECTRONICS
43 Belmont Drive
Somerset, N.J. 08873
Tel: 201-469-6008 TWX: 710-480-4733

STERLING ELECTRONICS
774 Pfeiffer Blvd.
Perth Amboy, N.J. 08861
Tel: 201-442-8000 Telex: 138-679

WILSHIRE ELECTRONICS
855 Industrial Highway, Unit 5
Cinnaminson, New Jersey 08077
Tel: 215-627-1920

WILSHIRE ELECTRONICS
1111 Paulison Avenue
Clifton, New Jersey 07015
Tel: 201-365-2600 TWX: 710-989-7052

NEW MEXICO
CENTURY ELECTRONICS
11728 Linn Ave.
Albuquerque, New Mexico 87123
Tel: 505-292-2700 TWX: 910-989-0625

HAMILTON/AVNET ELECTRONICS
2450 Baylor Dr. S.E.
Albuquerque, New Mexico 87119
Tel: 505-765-1500
TWX: None — use 910-379-6486
(Regional Hq. in Mt. View, Ca.)

NEW YORK
ARROW ELECTRONICS
399 Conklin Street
Farmingdale, New York 11735
Tel: 516-694-6800

CRAMER ELECTRONICS
129 Oser Avenue
Hauppauge, N.Y. 11787
Tel: 516-231-5682

CRAMER ELECTRONICS
6716 Joy Road
E. Syracuse, N.Y. 13057
Tel: 315-437-6671

COMPONENTS PLUS, INC.
40 Oser Avenue
Hauppauge, L.I., New York 11787
Tel: 516-231-9200 TWX: 510-227-9869

HAMILTON/AVNET ELECTRONICS
167 Clay Road
Rochester, New York 14623
Tel: 716-442-7820
TWX: None — use 710-332-1201
(Regional Hq. in Burlington, Ma.)

HAMILTON/AVNET ELECTRONICS
6500 Joy Road
E. Syracuse, New York 13057
Tel: 315-437-2642 TWX: 710-541-0959

HAMILTON/AVNET ELECTRONICS
70 State Street
Westbury, L.I., New York 11590
Tel: 516-333-5800 TWX: 510-222-8237

ROCHESTER RADIO SUPPLY CO., INC.
140 W. Main Street
(P.O. Box 1971)
Rochester, New York 14603
Tel: 716-454-7800

SCHWEBER ELECTRONICS
Jericho Turnpike
Westbury, L.I.,New York 11590
Tel: 516-334-7474 TWX: 510-222-3660

SCHWEBER ELECTRONICS, INC.
2 Town Line Circle
Rochester, New York 14623
Tel: 716-461-4000

JACO ELECTRONICS, INC.
145 Oser Ave.
Hauppauge, L.I.,New York 11787
Tel: 516-273-1234 TWX: 510-227-6232

SUMMIT DISTRIBUTORS, INC.
916 Main Street
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Tel: 716-884-3450 TWX: 710-522-1692

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CRAMER ELECTRONICS
938 Burke Street
Winston Salem, N.C. 27102
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2803 Industrial Drive
Raleigh, North Carolina 27609
Tel: 919-829-8030

HALLMARK ELECTRONICS
1208 Front Street, Bldg. K
Raleigh, North Carolina 27609
Tel: 919-832-4465 TWX: 510-928-1831

RESCO
Highway 70 West
Rural Route 8, P.O. Box 116-B
Raleigh, North Carolina 27612
Tel: 919-781-5700

PIONEER/CAROLINA ELECTRONICS
2906 Baltic Avenue
Greensboro, North Carolina 27406
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761 Beta Drive, Suite E
Cleveland, Ohio 44143
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4800 East 131st Street
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PIONEER/DAYTON
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Dayton, Ohio 45404
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23880 Commerce Park Road
Beachwood, Ohio 44122
Tel: 216-464-2970 TWX: 810-427-9441

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23224 Commerce Park Road
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4846 South 83rd East Avenue
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RADIO INC. INDUSTRIAL ELECTRONICS
1000 South Main
Tulsa, Oklahoma 74119
Tel: 918-587-9123

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HALLMARK ELECTRONICS, INC.
458 Pike Road
Huntingdon Valley, Pennsylvania 19006
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PIONEER/DELAWARE VALLEY ELECTRONICS
141 Gibraltar Road
Horsham, Pa. 19044
Tel: 609-541-1120 TWX: 510-665-6778

PIONEER ELECTRONICS, INC.
560 Alpha Drive
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101 Rock Road
Horsham, Pennsylvania 19044
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SHERIDAN SALES COMPANY
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DIXIE ELECTRONICS, INC.
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1900 Barnwell Street
Columbia, South Carolina 29201
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401 East 8th Street
Fort Worth, Texas 76102
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HALLMARK ELECTRONICS CORP.
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9333 Forest Lane
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8000 Westglen
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4445 Sigma Road
Dallas, Texas 75240
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Telex: HAMAVLECB DAL 73-0511

HAMILTON/AVNET ELECTRONICS
3939 Ann Arbor
Houston, Texas 77042
Tel: 713-780-1771
Telex: HAMAVLECB HOU 76-2589

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14177 Proton Road
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Tel: 214-661-5010 TWX: 910-860-5493

SCHWEBER ELECTRONICS, INC.
7420 Harwin Drive
Houston, Texas 77036
Tel: 713-784-3600 TWX: 910-881-1109

STERLING ELECTRONICS
4201 Southwest Freeway
Houston, Texas 77027
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Telex: STELECO HOUA 77-5299

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2258 South 2700 West
Salt Lake City, Utah 84119
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HAMILTON/AVNET ELECTRONICS
1585 West 2100 South
Salt Lake City, Utah 84119
Tel: 801-972-2800
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13407 Northrup Way
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Tel: 206-746-8750 TWX: 910-443-2449

LIBERTY ELECTRONICS
1750 132nd Ave. N.E.
Bellevue, Washington 98005
Tel: 206-453-8300 TWX: 910-444-1379

RADAR ELECTRIC CO., INC.
168 Western Avenue West
Seattle, Washington 98119
Tel: 206-282-2511 TWX: 910-444-2052

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2975 Moorland Road
New Berlin, Wisconsin 53151
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MARSH ELECTRONICS, INC.
1563 South 100 Street
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SEMICONDUCTOR SPECIALISTS, INC.
10855 W. Potter Road
Wauwatosa, Wisconsin 53226
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CAM GARD SUPPLY LTD.
10505 111th Street
Edmonton, Alberta T5H 3E8, Canada
Tel: 403-426-1805 Telex: 03-72960

CAM GARD SUPPLY LTD.
4910 52nd Street
Red Deer, Alberta, T4N 2C8, Canada
Tel: 403-346-2088

CAM GARD SUPPLY LTD.
825 Notre Dame Drive
Kamloops, British Columbia, V2C 5N8, Canada
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CAM GARD SUPPLY LTD.
1777 Ellice Avenue
Winnepeg, Manitoba, R3H 0W5, Canada
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Rookwood Avenue
Fredericton, New Brunswick, E3B 4Y9, Canada
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CAM GARD SUPPLY LTD.
15 Mount Royal Blvd.
Moncton, New Brunswick, E1C 8N6, Canada
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Courtenay Center
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1501 Ontario Avenue
Saskatoon, Saskatchewan, S7K 1S7, Canada
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Willowdale, Ontario, M2H 3B3, Canada
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130 Albert Street
Ottawa, Ontario, K1P 5G4, Canada
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FUTURE ELECTRONICS CORPORATION
44 Fasket Drive, Unit 24
Rexdale, Ontario, M9W IK5, Canada
Tel: 416-677-7820

FUTURE ELECTRONICS CORPORATION
5647 Ferrier Street
Montreal, Quebec, H4P 2K5, Canada
Tel: 514-735-5775

HAMILTON/AVNET INTERNATIONAL
(CANADA) LTD.
6291 Dorman Rd., Unit 16
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R.A.E. INDUSTRIAL ELECTRONICS, LTD.
1629 Main Street
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Telex: RAE-VCR 04-54550

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625 Marshall Ave., Suite 2
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1111 Finch Avech Ave. W., Suite 102
Downsview, Ontario, M3J 2E5, Canada
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1485 Laperriere Ave.
Ottawa, Ontario, K1Z 7S8, Canada
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2400 Bob Wallace Ave., Suite 201
Huntsville, Alabama 35805
Tel: 205-533-3509

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CELTEC COMPANY
18009 Sky Park Circle Suite B
Irvine, California 92715
Tel: 714-557-5021 TWX: 910-595-2512

CELTEC COMPANY
15300 Ventura Blvd., Room 200
Sherman Oaks, California 91403
Tel: 213-990-3440 TWX: 910-495-2010

CELTEC COMPANY
7867 Convoy Court, Suite 312
San Diego, California 92111
Tel: 714-279-7961 TWX: 910-335-1512

MAGNA SALES, INC.
3212 Scott Blvd.
Santa Clara, California 95050
Tel: 408-985-1750 TWX: 910-338-0241

COLORADO
SIMPSON ASSOCIATES, INC.
2552 Ridge Road
Littleton, Colorado 80120
Tel: 303-794-8381 TWX: 910-935-0719

CONNECTICUT
PHOENIX SALES COMPANY
389 Main Street
Ridgefield, Connecticut 06877
Tel: 203-438-9644 TWX: 710-467-0662

FLORIDA
LECTROMECH, INC.
303 Whooping Loop
Altamonte Springs, Florida 32701
Tel: 305-831-1577 TWX: 810-853-0262

LECTROMECH, INC.
2741 North 29th Avenue, Suite 218
Hollywood, Florida 33020
Tel: 305-920-2291 TWX: 510-954-9793

LECTROMECH, INC.
2280 U.S. Highway 19 North
Suite 119 Bldg L
Clearwater, Florida 33515
Tel: 813-726-0541

GEORGIA
CARTWRIGHT & BEAN, INC.
P.O. Box 52846 (Zip Code 30355)
90 W. Wieuca Square, Suite 155
Atlanta, Georgia 30342
Tel: 404-255-5262 TWX: 810-751-3220

ILLINOIS
MICRO SALES, INC.
2258-B Landmeir Road
Elk Grove Village, Illinois 60007
Tel: 312-956-1000 TWX: 910-222-1833

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LESLIE M. DEVOE COMPANY
4215 East 82nd Street Suite D
Indianapolis, Indiana 46250
Tel: 317-842-3245 TWX: 810-260-1435

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B.C. ELECTRONICS SALES, INC.
4403 First Avenue S.E., Suite 412
Cedar Rapids, Iowa 52402
Tel: 319-393-5818

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B.C. ELECTRONIC SALES, INC.
P.O. Box 788
11495 Lenexa Drive
Olathe, Kansas 66061
Tel: 913-888-6680 TWX: 910-749-6414

MARYLAND
DELTA III ASSOCIATES
5801 Annapolis Road, Suite 500
Bladensburg, Maryland 20710
Tel: 301-779-0977 TWX: 710-826-9654

MASSACHUSETTS
SPECTRUM ASSOCIATES, INC.
888 Worcester Street
Wellesley, Massachusetts 02181
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RATHSBURG ASSOCIATES
16621 E. Warren Ave.
Detroit, Michigan 48224
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7710 Computer Avenue
Minneapolis, Minnesota 55435
Tel: 612-835-1777 TWX: 910-576-3483

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CARTWRIGHT & BEAN, INC.
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580 Valley Road
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NEW YORK
LORAC SALES, INC.
550 Old Country Road, Room 410
Hicksville, New York 11801
Tel: 516-681-8746 TWX: 510-224-6480

TRI-TECH ELECTRONICS, INC.
3215 East Main Street
Endwell, New York 13760
Tel: 607-754-1094 TWX: 510-252-0891

TRI-TECH ELECTRONICS, INC.
290 Perinton Hills Office Park
Fairport, New York 14450
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TRI-TECH ELECTRONICS, INC.
6836 East Genesee Street
Fayetteville, New York 13066
Tel: 315-446-2881 TWX: 710-541-0604

TRI-TECH ELECTRONICS, INC.
15 College View Avenue
Poughkeepsie, New York 12603
Tel: 914-473-3880

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THE LYONS CORPORATION
6151 Wilson Mills Road, Suite 101
Highland Heights, Ohio 44143
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9717 East 42nd Street, Suite 210
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Bldg. B, Suite 185
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Altamonte Springs 32701
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Rolling Meadows 60008
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Fairport 14450
Tel: 716-223-7700

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