

Selector Guide and Functional Index

The following selector guides provide a comparison of the key parameters for all Fairchild TTL devices. They should be used to help determine the most suitable device for a specific application. Final selection should be made using the appropriate data sheet.

Charts are provided covering the following device categories.

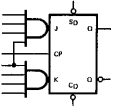

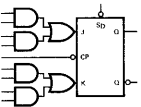

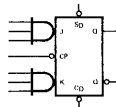

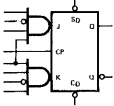

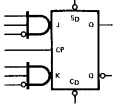

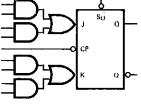

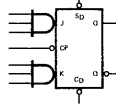

SSI

- Gates, Buffers and Inverters
- Flip-Flops
- Monostables
- Interface-Drivers
- Interface-Receivers
- Interface-Level Translators

MSI/MEMORIES

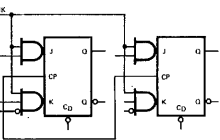

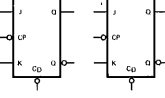

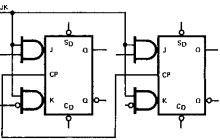

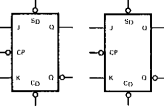

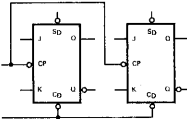

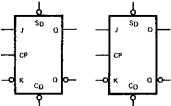

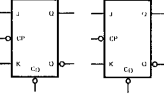

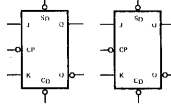

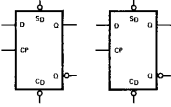

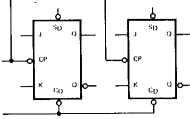

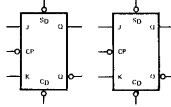

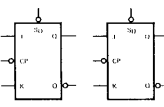

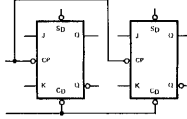

- Arithmetic Operators
 - Adders, ALU.S, Comparators, Multipliers, Parity Checkers.
- Counters
- Decoders-Display
- Decoders/Demultiplexers
- Encoders
- Latches
- Memories [RAM (Read/Write), ROM, Associative]
- Multiplexers
- Registers

SINGLE FLIP-FLOP SELECTOR GUIDE

	OUTPUT CHANGES ON POSITIVE GOING EDGE	OUTPUT CHANGES ON NEGATIVE GOING EDGE	
MASTER/SLAVE	 <p>9000/74104 20 MHz/16 ns</p> 	<p>9H71/74H71 30 MHz/22 ns</p>  	<p>9N72/7472 20 MHz/25 ns 9H72/74H72 30 MHz/22 ns</p>  
	 <p>9001/74105 50 MHz/16 ns</p> 		
EDGE TRIGGERED	 <p>9N70/7470 35 MHz/27 ns</p> 	 <p>9H101/74H101 50 MHz/16 ns</p> 	 <p>9H102/74H102 50 MHz/16 ns</p> 

3

DUAL FLIP-FLOP SELECTOR GUIDE

MASTER/SLAVE	 <p>9020 50 MHz/16 ns</p> 	 <p>9N73/7473 • 9N107/74107 20 MHz/25 ns 9H73/74H73 30 MHz/22 ns</p> 	
	 <p>9022 50 MHz/16 ns</p> 	 <p>9N76/7476 20 MHz/25 ns 9H76/74H76 30 MHz/22 ns</p> 	 <p>9H78/74H78 30 MHz/22 ns</p> 
EDGE TRIGGERED	 <p>9024 25 MHz/22 ns 9L24 8 MHz/66 ns 9S109 100 MHz/7 ns</p> 	 <p>9H103/74H103 50 MHz/16 ns</p> 	 <p>9H106/74H106 50 MHz/16 ns</p> 
	 <p>9N74/7474 25 MHz/20 ns 9H74/74H74 43 MHz/13 ns 9S74/74S74 100 MHz/7 ns</p> 	 <p>9H108/74H108 50MHz/16 ns</p> 	 <p>9S112/74S112 125 MHz/5 ns</p> 
		 <p>9S113/74S113 125 MHz/5 ns</p> 	 <p>9S114/74S114 125 MHz/5 ns</p> 

MASTER/SLAVE (or "ONES CATCHING" MASTER/SLAVE)—The master is sensitive to input conditions during the active portion of the clock pulse.
EDGE TRIGGERED — Only sensitive to input conditions immediately prior to active clock edge.

SSI • GATES, BUFFERS AND INVERTERS

	LOW POWER		STANDARD	
	$t_{pd} = 20 \text{ ns}$ $P_d = 2 \text{ mW per Gate}$		$t_{pd} = 10 \text{ ns}$ $P_d = 10 \text{ mW per Gate}$	
	$0^\circ \text{C to } +70^\circ \text{C and}$ $-55^\circ \text{ to } +125^\circ \text{C}$		$0^\circ \text{ to } +70^\circ \text{C}$	$-55^\circ \text{ to } +125^\circ \text{C}$
NAND GATES				
Quad 2-Input Positive NAND Gate	9L00	9N00/7400	9N00/5400	
Quad 2-Input Positive NAND Gate with Open-Collector Output		9N01/7401	9N01/5401	
		9N03/7403	9N03/5403	
Quad 2-Input Positive NAND Gate (15 Volts)		9N26/7426	9N26/5426	
Triple 3-Input Positive NAND Gate		9N10/7410	9N10/5410	
Triple 3-Input Positive NAND (Open Collector)		9N12/7412	9N12/5412	
Dual 4-Input Positive NAND Gate		9N20/7420	9N20/5420	
8-Input Positive NAND Gate		9N30/7430	9N30/5430	
NOR GATES				
Quad 2-Input Positive NOR Gate		9N02/7402	9N02/5402	
Quad 2-2-2-4-Input Positive NOR Gate				
Triple 3-Input Positive NOR Gate		9N27/7427	9N27/5427	
Dual 4-Input Positive NOR Gate (with strobe)		9N23,25/7423,25	9N23,25/5423,25	
AND GATES				
Quad 2-Input Positive AND Gate		9N08/7408	9N08/5408	
Quad 2-Input Positive AND Gate (Open Collector)		9N09/7409	9N09/5409	
Triple 3-Input Positive AND Gate		9N11/7411	9N11/5411	
Dual 4-Input Positive AND Gate				
OR GATES				
Quad 2-Input Positive OR Gate		9N32/7432	9N32/5432	
EXCLUSIVE-OR GATES				
Quad Exclusive-OR Gate	9L86	9N86/7486	9N86/5486	
Quad Exclusive-OR Gate with Inverted Outputs				
AND-OR, AND-OR-INVERT GATES AND EXPANDERS				
Expandable 2-2-2-3 Input AND-OR Gate				
Dual 2-Wide 2-Input AND-OR-INVERT Gate		9N51/7451	9N51/5451	
Expandable Dual 2-Wide 2-Input AND-OR-INVERT Gate		9N50/7450	9N50/5450	
Expandable 2-Wide, 4-Input AND-OR-INVERT Gate				
4-Wide 2-Input AND-OR-INVERT Gate	9L54	9N54/7454	9N54/5454	
4-2-3-2-Input AND-OR-INVERT Gate				
4-2-3-2-Input AND-OR-INVERT Gate (Open Collector)				
Expandable 4-Wide 2-Input AND-OR-INVERT Gate		9N53/7453	9N53/5453	
Expandable 4-Wide 2-2-2-3-Input AND-OR-INVERT Gate				
Triple 3-Input Expander				
Dual 4-Input Expander		9N60/7460	9N60/5460	
3-2-2-3-Input AND-OR Expander				
INVERTERS AND BUFFERS				
Hex Inverter	9L04	9N04/7404	9N04/5404	
Hex Inverter with Open-Collector Output		9N05/7405	9N05/5405	
Hex Inverter Buffer/Driver (30 Volts)		9N06/7406	9N06/5406	
Hex Inverter Buffer/Driver (15 Volts)		9N16/7416	9N16/5416	
Hex Buffer/Drivers (30 Volts)		9N07/7407	9N07/5407	
Hex Buffer/Drivers (15 Volts)		9N17/7417	9N17/5417	
Quad 2-Input Positive NAND Buffer		9N37/7437	9N37/5437	
Quad 2-Input Positive NAND Buffer (Open Collector)		9N38/7438	9N38/5438	
Quad 2-Input Positive NAND Buffer (Open Collector - 15 Volts)		9N39/7439		
Dual 4-Input Positive NAND Buffer		9N40/7440	9N40/5440	
Dual 4-Input Positive NAND 50 Ω Driver				
SCHMITT TRIGGER				
Dual NAND Schmitt Trigger		9N13/7413	9N13/5413	

SSI • GATES, BUFFERS AND INVERTERS

STANDARD	HIGH SPEED		SUPER HIGH SPEED (SCHOTTKY)	
$t_{pd} = 8 \text{ ns}$ $P_d = 10 \text{ mW per Gate}$	$t_{pd} = 6 \text{ ns}$ $P_d = 22 \text{ mW per Gate}$		$t_{pd} = 3 \text{ ns}$ $P_d = 19 \text{ mW per Gate}$	
$0^\circ\text{C to } +70^\circ\text{C}$ and $-55^\circ\text{ to } +125^\circ\text{C}$	$0^\circ\text{ to } +70^\circ\text{C}$	$-55^\circ\text{ to } +125^\circ\text{C}$	$0^\circ\text{ to } +70^\circ\text{C}$	$-55^\circ\text{ to } +125^\circ\text{C}$
9002	9H00/74H00 9H01/74H01	9H00/54H00 9H01/54H01	9S00/74S00	9S00/54S00
9012			9S03/74S03	*9S03/54S03
9003	9H10/74H10	9H10/54H10	*9S10/74S10	*9S10/54S10
9004	9H20,22/74H20,22	9H20,22/54H20,22	9S20,22/74S20,22	9S20*, 22/54S20*, 22
9007	9H30/74H30	9H30/54H30		
9015				
	9H08/74H08	9H08/54H08		
	9H11/74H11	9H11/54H11	*9S11/74S11	*9S11/54S11
	9H21/74H21	9H21/54H21		
9014				
9005	9H52/74H52 9H51/74H51 9H50/74H50 9H55/74H55 *9H54/74H54	9H52/54H52 9H51/54H51 9H50/54H50 9H55/54H55 *9H54/54H54	9S64/74S64 9S65/74S65	9S64/54S64 *9S65/54S65
9008	*9H53/74H53	*9H53/54H53		
9006	9H61/74H61 9H60/74H60 *9H62/74H62	9H61/54H61 9H60/54H60 *9H62/54H62		
9016	9H04/74H04	9H04/54H04	9S04/74S04, 9S04A	9S04/54S04, 9S04A
9017	9H05/74H05	9H05/54H05	9S05/74S05, 9S05A	*9S05/54S05, *9S05A
9009	9H40/74H40	9H40/54H40	9S40/74S40 9S140/74S140	9S40/54S40 9S140/54S140

* To be announced.

SELECTOR GUIDE/FUNCTIONAL INDEX

SSI MONOSTABLES

Function	Type No.	Pulse Width Variation (%)		Number of Inputs		Resettable	Min. Output t_{pw} ns	Power Dissipation mW	Page No.
		vs. Temp	vs. V_{CC}	Positive	Negative				
Single Retriggerable	9600	± 1.5	± 1.5	3	2	x	75	125	7-1
	9601	± 2.7	± 1.0	2	2		50	125	7-6
Dual Retriggerable	9602	± 1.5	± 1.5	1	1	x	72	250	7-11
	96L02	± 0.4	± 1.5	1	1	x	110	50	7-16
Single Non-Retriggerable	9603	± 0.2	± 0.15	1	2		40	90	7-21

SSI INTERFACE – DRIVERS

Function	Type No.	Companion Receiver	Supply Voltages	V_{OH}	V_{OL}	t_{pd} ns	Power Dissipation mW	Page No.
			V	V	V			
Single +5 V Operation	9614	9615	+5.0	+3.2	+0.2	16	175	7-25
EIA RS232 Operation	9616	9617	+12	+6	-6	300	250	7-27
			-12					
General Purpose	75109	75107	+5	O.C.*	O.C.*	9	180	7-35
			-5					
High Voltage	9644 75450		+5	30	0.8	50	120	7-33
			+5	30	0.4			

*Open Collector

SSI INTERFACE – RECEIVERS

Function	Type No.	Companion Driver	Supply Voltages	V_{TH}	V_{CM}	Output Enable	Diff. Inputs	t_{pd} ns	Power Dissipation mW	Page No.
			V	V	V					
Single +5 V Operation	9615	9614	+5	± 0.5	± 15	x	x	28	175	7-26
EIA RS-232 Operation	9617	9616	+5	+1.5	± 25			50	100	7-28
General Purpose	9620	9621	+5	± 0.5	± 15		x	30	110	7-31
			-12							
	9622	9621	+5	± 2.0	± 10	x	x	35	140	
			-10							
	75107	75109	± 5	± 0.25	± 3	x	x	19	180	7-34
	75108	75110	± 5	± 0.25	± 3	x	x	19	180	7-34

SSI INTERFACE – LEVEL TRANSLATORS

Function	Type No.	Supply Voltages		V_{OH} V	V_{OL} V	t_{pd} ns	Power Dissipation mW	Page No.
		+V	-V					
TTL – MOS Dual 2-Input w/Expander	9624	5.0	0 – 30	-0.5	+0.2	120	40	7-32
MOS – TTL Dual Buffer	9625	5.0	0 – 30	+0.4	+2.6	70	60	7-32
*HLL – TTL Hex-Inverter	9109	12–20	0	2.4–5.5	0.4	120	380	**
TTL – *HLL Hex-Inverter	9112	12–20	0	10–18		90	440	**

*HLL = HIGH Level Logic

**For Data Sheet write FSC, P.O. Box 880A, Mt. View, California 94040

SELECTOR GUIDE/FUNCTIONAL INDEX

MSI ARITHMETIC OPERATORS ADDERS, A.L.U.'S, COMPARATORS, MULTIPLIERS

Function	Type No.	Description	Number of Bits	t _{pd} ns	Power Dissipation mW	Page No.
Addition	9380	Single 1-Bit Full Adder	1	47	105	8-215
	9304	Dual 1-Bit Full Adder	1	26	150	8-24
	93H183	Dual 1-Bit Full Adder	1	12	250	8-288
	9382	Single 2-Bit Full Adder	2	38	176	8-221
	9383	Single 4-Bit Full Adder	4	39	390	8-225
Arithmetic Logic Units	9340	ALU with Internal CLA	4	24	400	8-148
	9341	ALU with External CLA	4	24	450	8-153
	93S41	ALU with External CLA	4	11	500	8-158
CLA Carry Look-Ahead	9342	For Use with 9341		12	180	8-163
	93S42	For Use with 93S41		7	260	8-167
Multiplication	9344	Binary Full Multiplier	4 x 2	30	550	8-168
Compare	9324	Magnitude Comparator	5	20	210	8-124
	93L24	Magnitude Comparator	5	55	55	8-128
	9386	Identity Comparator (Quad EX-NOR)	4	18	170	8-230
Parity	9348	Parity Checker/Generator	12	40	270	8-177
	93S62	Parity Checker/Generator	9	16	350	8-206
True/Complement Generation	93H87	True/Complement, Zero/One Element	4	14	270	8-232

MSI COUNTERS

Function	Type No.	Parallel Load	Count Enable	Clock Transitions	Async. Clear	Count Rate MHz	t _{pd} ns	Power Dissipation mW	Page No.
Variable Modulo	9305			L-H	L	26	55	195	8-28
	93S05			L-H	L	100	25	400	8-33
Decade Synchronous	9310	S	H	L-H	L	45	15	325	8-54
	93L10	S	H	L-H	L	20	25	75	8-60
	93S10	S	H	L-H	L	90	8	400	8-65
Decade Asynchronous	9350			H-L	H	18	60	160	8-180
	9390			H-L	H	18	60	160	8-236
	93176	A		H-L	L	25	30	185	8-282
	93196	A		H-L	L	70	28	250	8-297
Decade Up/Down	9360	A		L-H	H	30	30	300	8-203
	93190	A	L	L-H		25	37	325	8-292
Binary Synchronous	9316	S	H	L-H	L	45	15	325	8-54
	93L16	S	H	L-H	L	20	25	75	8-60
	93S16	S	H	L-H	L	90	8	400	8-65
Binary Asynchronous	9356			H-L	H	18	75	160	8-188
	9393			H-L	H	18	75	160	8-248
	93177	A		H-L	L	25	30	185	8-282
	93197	A		H-L	L	70	42	250	8-297
Binary Up/Down	9366	A		L-H	H	30	30	300	8-203
	93191	A	L	L-H		25	37	325	8-292
Divide by 12	9392			H-L	H	18	60	160	8-244

S = Synchronous
A = Asynchronous

SELECTOR GUIDE/FUNCTIONAL INDEX

MSI DECODERS/DEMULTIPLEXERS

Function	Type No.	Active LOW Outputs No.	Separate Enable	Wired-OR Capability	Select Delay ns	Enable Delay ns	Power Dissipation mW	Page No.
Dual 1-of-4 (BCD)	9321	2 x 4	x		22	17	150	8-111
	93L21	2 x 4	x		50	38	45	8-114
1-of-8	9301	8	x		22	22	145	8-15
	9334	8*	x		22	19	280	8-138
	9302	8	x	x	30	30	145	8-21
1-of-10 (BCD)	9301	10			22		145	8-15
	93L01	10			63		45	8-18
	9302	10		x	30		145	8-21
	9345	10		x	50		215	8-173
1-of-10 (Excess 3)	9352	10			24		140	8-183
	9353	10			24		140	8-183
1-of-16	9354	10			24		140	8-183
	9311	16	x		21	17	175	8-66
Programmable	93L11	16	x		70	48	58	8-69
	93402	4**	x	x	25	25	500	9-6

*9334 is an 8-Bit addressable latch which can be used as an active HIGH decoder or demultiplexer.

**93402 is a 4x4 content addressable memory which can also be used as a programmable decoder.

MSI DISPLAY DECODER/DRIVERS

Function	Type No.	Output Sink mA	Output Voltage V	Pull-Up Resistors	Ripple Blanking	Blanking Above BCD 9 Input	Power Dissipation mW	Page No.
1-of-10 (Cold Cathode)	9315	7	55				100	8-95
	93141	7	55			x	105	8-261
1-of-10 (Incandescent, Relays Actuators)	9302	16	5			x		8-21
	9345	80	30			x	215	8-173
	93145	80	15			x	215	8-173
7-Segment (Decoder)	9307	11	5	x	x		165	8-34
	9358	8	5	x	x		265	8-197
	9359	9.6	5				167	8-197
7-Segment (Incandescent or LED)	9317B	40	20		x	x	220	8-98
	9317C	20	30		x	x	220	8-98
	9357A	20	30		x		265	8-191
	9357B	20	15		x		265	8-191

7-SEGMENT DECODING FORMATS

9307

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5

9317

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1	2	3	4	5	6	7	8	9						

9357A, 9357B, 9358 and 9359

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5

SELECTOR GUIDE/FUNCTIONAL INDEX

MSI ENCODERS

Function	Type No.	Description	t _{pd} ns	Power Dissipation mW	Page No.
Encoders	9318	8-Input Priority Encoder	25	250	8-103
	93L18	8-Input Priority Encoder	55	70	8-107

MSI LATCHES

Function	Type No.	R-S Input	D Input	Enable Active	Clear	Reset	t _{pd} Enable ns	t _{pd} Data ns	Power Dissipation mW	Page No.
4-Bit	9314	x	x	L	x	x	20	10	175	8-85
	93L14	x	x	L	x	x	70	45	50	8-90
	9375		x	H			16	16	160	8-211
	9377		x	H			16	16	160	8-211
Dual 4-Bit	9308		x	L	x	x	20	15	340	8-38
	93L08		x	L	x	x	65	50	90	8-43
Addressable 8-Bit	9334*		x	L	x	x	20	30	280	8-138

* Addressable latch with single D-Input and three address lines.

MEMORIES

Function	Type No.	Organization		Decoding Scheme	Wired-OR Output	Address Access ns	Chip Select Access ns	Power Per Bit mW	Page No.
		Words	Bits						
16-Bit RAM	93407	16	1	1-of-4/1-of-4	x	15		20	9-23
	93433	16	1	Coincident Select	x	15		20	9-23
64-Bit RAM	93403	16	4	Full	x	40	40	8	9-10
	93435	16	4	1-of-16 Select	x	20	20	8	9-38
256-Bit RAM	93400	256	1	3-of-6/3-of-6	x	70	70	2	9-1
	93410	256	1	Full	x	30	20	1.8	9-27
1024-Bit RAM	93415	1024	1	Full	x	75	40	0.5	9-32
256-Bit ROM	93434	32	8	Full	x	40	40	2	9-35
1024-Bit ROM	93406	256	4	Full	x	40	30	0.7	9-13
8-Bit Multiple Port	9338	8	1	Full		25		50	8-142
	93S39	8	1	Full		12		60	8-147
16-Bit Associative	93402	4	4	Linear Select	x	20		25	9-6

SELECTOR GUIDE/FUNCTIONAL INDEX

MSI MULTIPLEXERS

Function	Type No.	Enable Input	Complementary Output	Wired-OR Capability	Data Z Delay ns	Data \bar{Z} Delay ns	Select Delay ns	Enable Delay ns	Power Dissipation mW	Page No.
Quad 2-Input	9322	x			10		19	15	125	8-117
	93L22	x			44		38	30	45	8-121
Dual 4-Input	9309		x		17	9	24		150	8-47
	93L09		x		34	18	48		40	8-51
	93153	x			15		22	19	180	8-272
Single 8-Input	9312	x	x		19	9	24	14	135	8-72
	93L12	x	x		80	18	48	28	34	8-76
	93S12	x	x		8	5	12	7	250	8-79
	9313	x	x	x	26	20	30	25	135	8-80
	93151	x	x		18	10	28	18	150	8-265
	93152					10	28		130	8-265
Single 16-Input	93150	x				10	28	18	200	8-265

MSI REGISTERS

Function	Type No.	No. Bits	Serial Data Input	Parallel Data Input	Reset Active	Clock Enable	Shift Frequency MHz	Clock to Output ns	Power Dissipation mW	Page No.
General Purpose	9300	4	J-K	S	L		35		300	8-1
	93L00	4	J-K	S	L		10	55	75	8-10
	93H00	4	J-K	S	L		55	10	375	8-6
	93S00	4	J-K	S	L		100	7	400	8-14
	93H72	4	D	S	L	x	60	10	400	8-207
	9394	4	D	A	H		15	25	175	8-252
	9395	4	D	S			36	21	250	8-254
	9396	5	D	A	L		15	25	240	8-259
	93178	4	D	S			22	25	170	8-283
93179	4	D	S	L		x	22	25	270	8-283
Parallel-In/ Parallel-Out	93198	8	D	S	L	x	35	20	370	8-301
Serial/Parallel Converters	93164	8	D		L		20	20	180	8-276
	93165	8	D	A		x	20	20	230	8-279
Multiple Port	9338	8	D					25	265	8-142
	93S39	8	D					12	400	8-147
Serial-In	9328	16	D		L	x	25	15	300	8-131
Serial-Out	93L28	16	D		L	x	10	50	75	8-135

S = Synchronous
A = Asynchronous