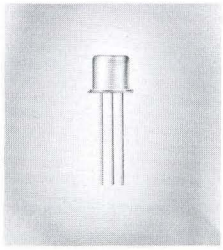
TYPE 2N703

N-P-N DIFFUSED-BASE MESA SILICON TRANSISTOR

TYPE 2N703
BULLETIN NO. DL-S-1135 AUGUST 1959

High-Speed Switching Transistor

- Low saturation voltage
- DC beta from 40 to 100
- Subminiature TO-18 package
- Guaranteed low temperature beta



ACTUAL SIZE

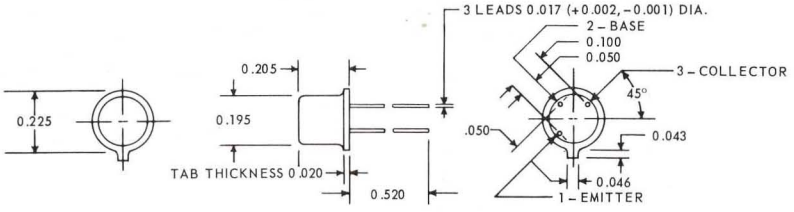
qualification testing

All units are heat cycled from −65°C to +175°C for 10 cycles. The hermetic seal is checked by pressure testing. All units are completely tested for electrical characteristics and undergo a rigorous tumble test to check for mechanical reliability.

mechanical data

Welded case with glass-to-metal hermetic seal between case and leads. Unit weight is ⅓ gram. These units meet JEDEC outline TO-18, and E3-58 base dimensions.

THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE CASE



DIMENSIONS ARE MAXIMUM IN INCHES UNLESS OTHERWISE SPECIFIED

maximum ratings at 25°C ambient (unless otherwise noted)

Collector-Base Voltage	25v
Collector-Emitter Voltage	25v
Emitter-Base Voltage	5v
Collector Current	50ma
Total Device Dissipation @ 25°C Case Temperature (See note 2)	600mw
Total Device Dissipation @ 25°C Free Air (See note 3)	300mw
Storage Temperature Range	−65°C to +175°C

electrical characteristics at T_A=25°C (unless otherwise noted)

PARAMETER		TEST CONDITIONS			min	typ	max	unit
I_{CBO}	Collector Reverse Current	V_{CB} = 10v	I_E = 0		—	—	0.5	μa
I_{CBO}	Collector Reverse Current	V_{CB} = 10v	I_E = 0	T_A = +150°C	—	—	50	μa
I_{CEO}	Collector Reverse Current	V_{CE} = 20v	I_B = 0		—	—	10	μa
BV_{CBO}	Collector-Base Breakdown Voltage	I_{CBO} = 5μa	I_E = 0		25	—	—	v
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_{CEO} = 2ma	I_B = 0		25	—	—	v
BV_{EBO}	Emitter-Base Breakdown Voltage	I_{EBO} = 10μa	I_C = 0		5	—	—	v
h_{FE}	d-c Forward Current Transfer Ratio	V_{CE} = 5v	I_C = 10ma	T_A = −55°C	20	—	—	—
h_{FE} *	d-c Forward Current Transfer Ratio	V_{CE} = 5v	I_C = 10ma		40	—	100	—
V_{BE} *	Base-Emitter Voltage	V_{CE} = 5v	I_C = 10ma		0.7	—	0.95	v
$V_{CE(sat)}$ *	Collector-Emitter Saturation Voltage	I_C = 10ma	I_B = 0.5ma		—	—	0.5	v
C_{ob}	Output Capacitance	V_{CB} = 5v	I_E = 0	f = 1mc	—	3	6	μμf
f_T	Frequency at which $\|h_{fe}\|$ is unity	V_{CE} = 5v	I_E = −10ma		70	150	—	mc

*Semiautomatic testing is facilitated by using pulse techniques to measure these parameters. A 300-microsecond pulse (approximately 2% duty cycle) is utilized. Thus, the unit can be tested under maximum current conditions without a significant increase in junction temperature. The parameter values obtained in this manner are particularly pertinent for switching circuit design and, in general, indicates the true capabilities of the device.

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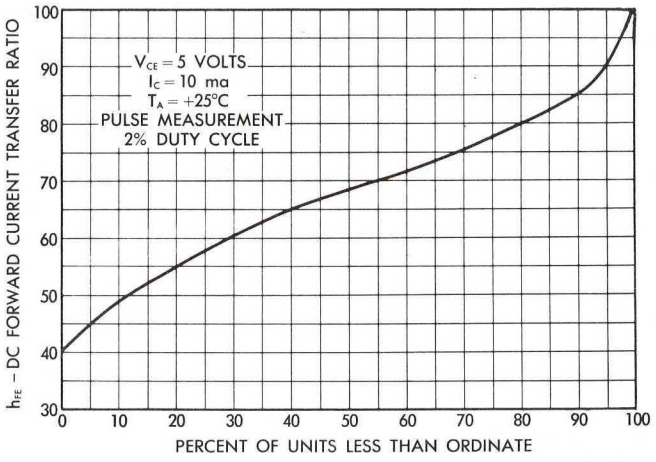
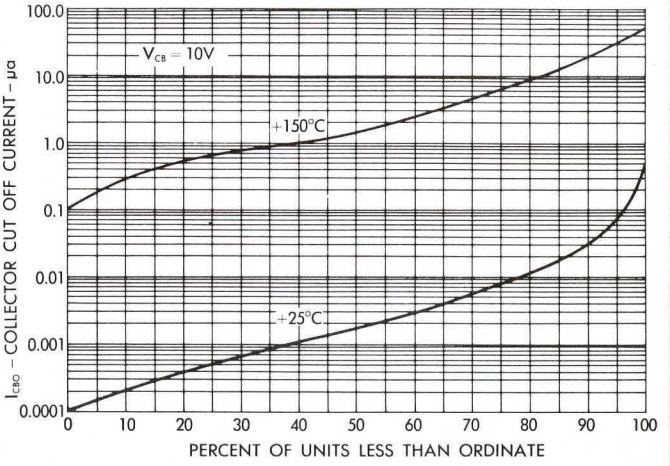
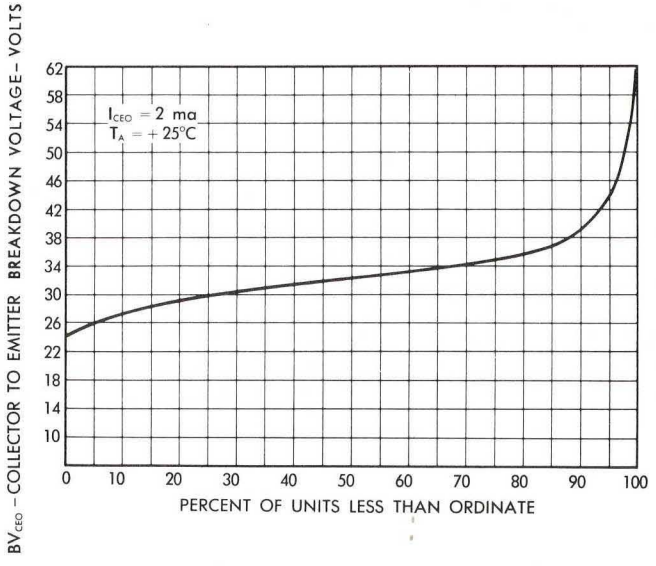
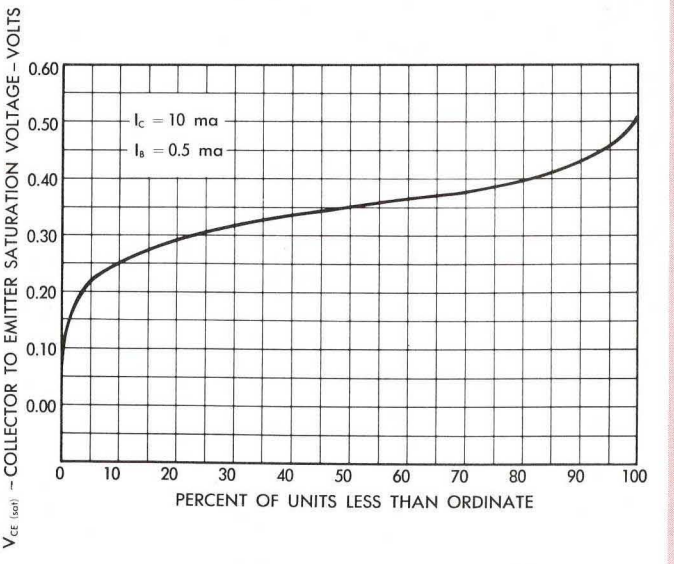
TYPE 2N703

TYPICAL PRODUCTION DISTRIBUTIONS









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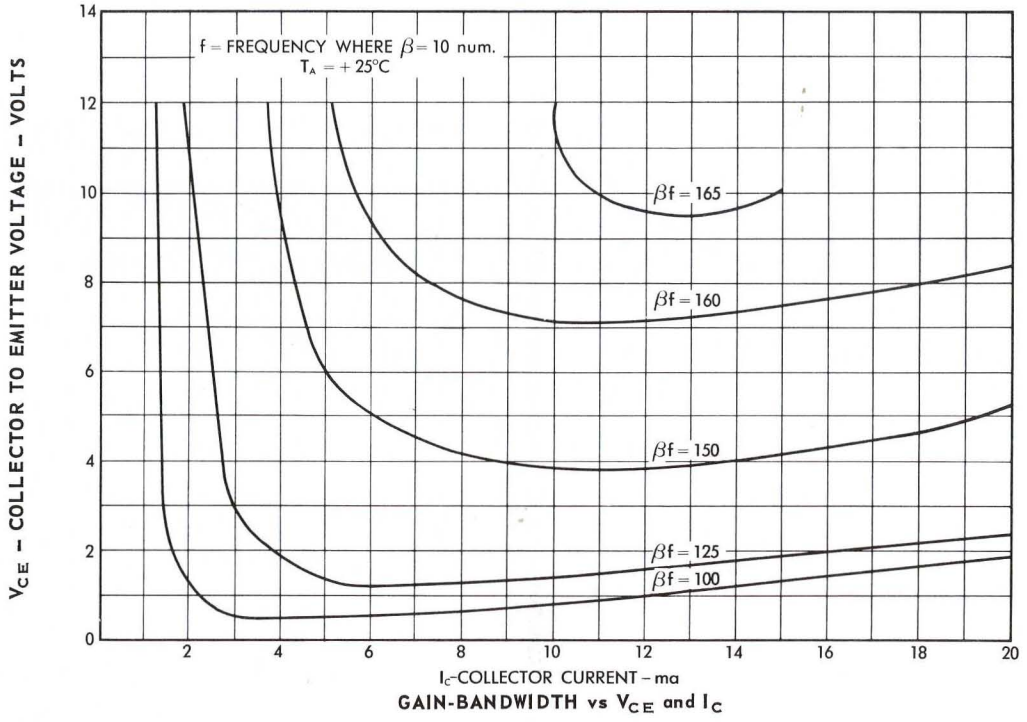
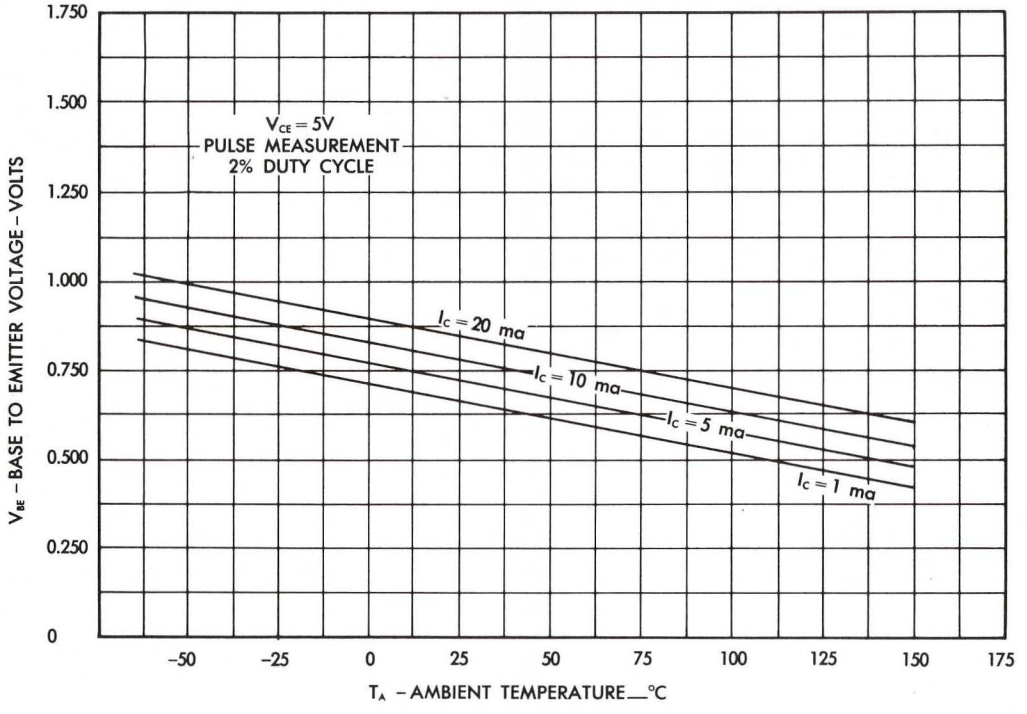
TYPICAL CHARACTERISTICS



GAIN-BANDWIDTH vs V_{CE} and I_C



hes unity when the base-emitter diode is open circuited.
In applications where the d-c circuit resistance between

at the rate of 0.25°C per milliwatt.
ire at the rate of 0.50°C per milliwatt.

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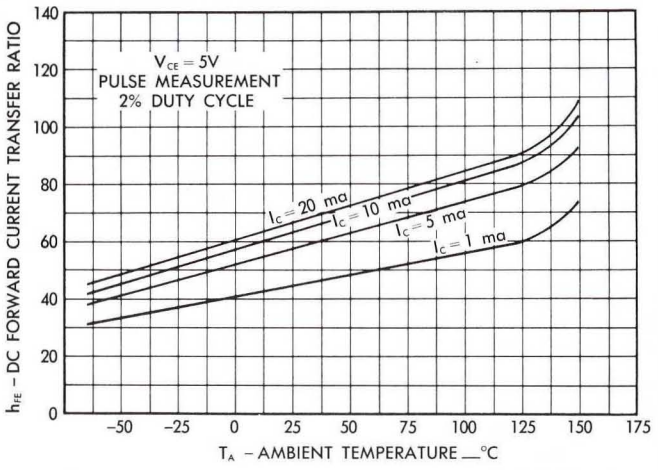
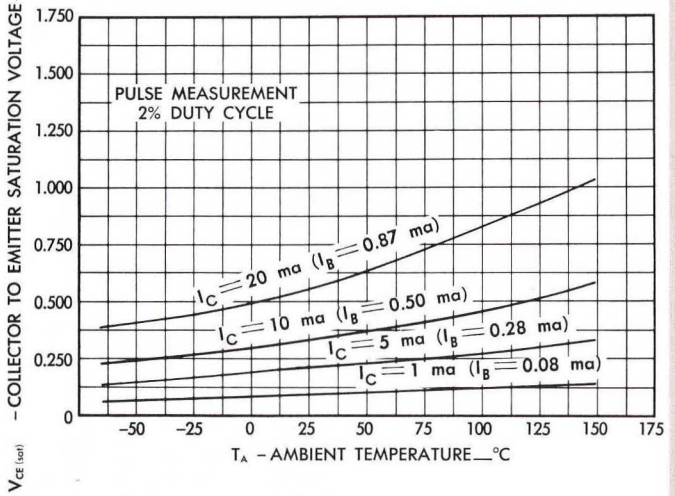
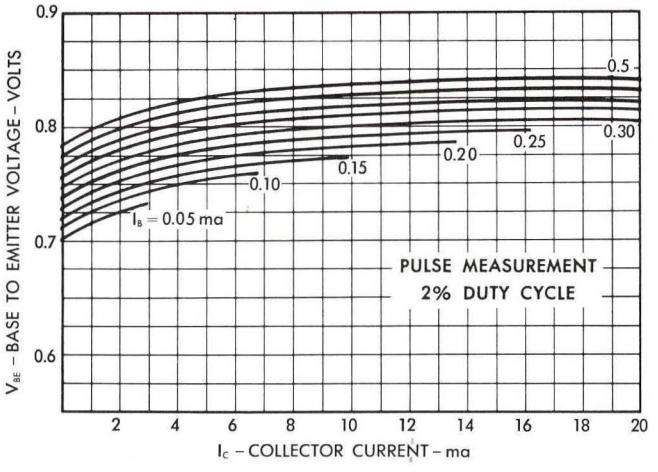
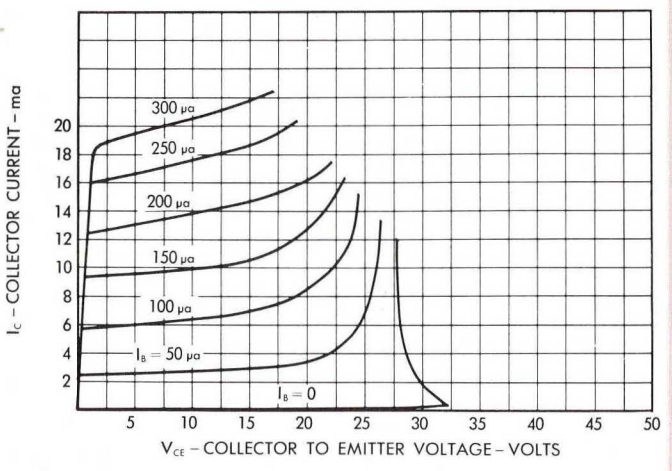
TYPICAL CHARACTERISTICS









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NOTE 1 – This is the voltage at which h_{FB} approaches u
This value may sometimes be exceeded in ap
base and emitter is a finite value.

NOTE 2 – Derate linearly to 175°C case temperature at th

NOTE 3 – Derate linearly to 175°C ambient temperature at