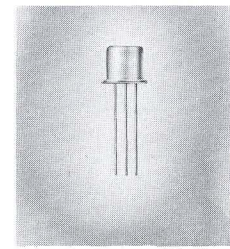




N-P-N DIFFUSED-BASE MESA SILICON TRANSISTOR

High-Speed Switching Transistor

- Low saturation voltage
- D-C beta from 20 to 60
- Subminiature TO - 18 package
- Guaranteed low temperature beta



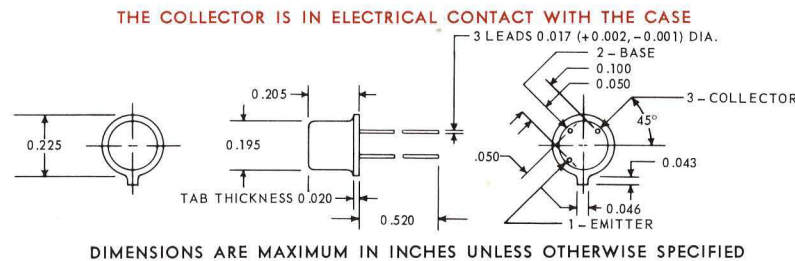
ACTUAL SIZE

qualification testing

All units are heat cycled from -65°C to $+175^{\circ}\text{C}$ 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 $\frac{1}{3}$ gram. These units meet JEDEC outline TO-18, and E3-58 base dimensions.



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

Collector-Base Voltage	25v
Collector-Emitter Voltage (See note 1)	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 $+175^{\circ}\text{C}$

electrical characteristics at $T_A=25^{\circ}\text{C}$ (unless otherwise noted)

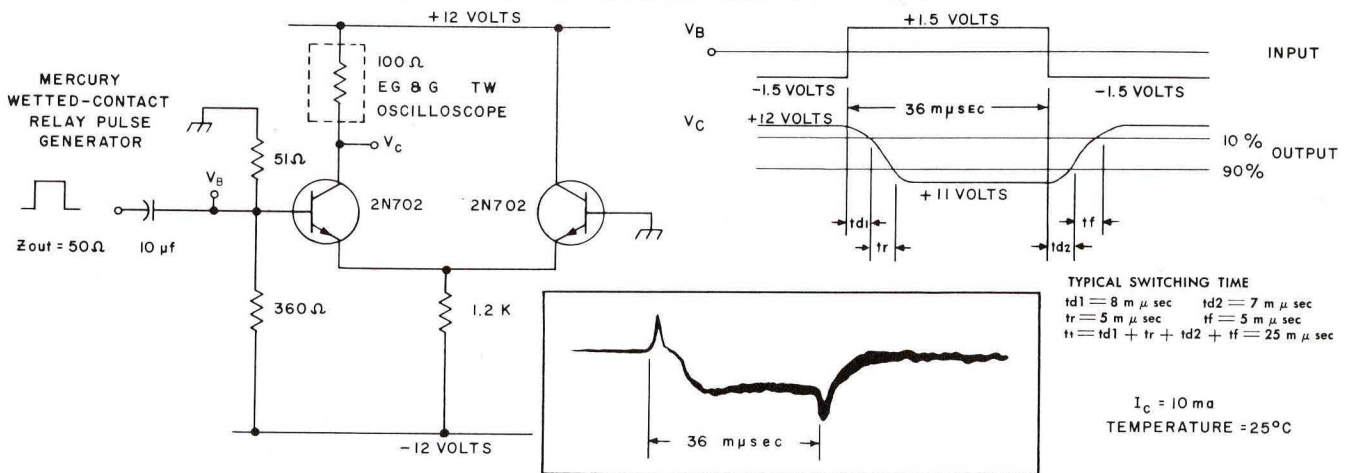
PARAMETER	TEST CONDITIONS	min	typ	max	unit
I_{CBO} Collector Reverse Current	$V_{CB} = 10\text{v}$ $I_E = 0$	—	—	0.5	μa
I_{CBO} Collector Reverse Current	$V_{CB} = 10\text{v}$ $I_E = 0$ $T_A = +150^{\circ}\text{C}$	—	—	50	μa
I_{CEO} Collector Reverse Current	$V_{CE} = 20\text{v}$ $I_B = 0$	—	—	10	μa
BV_{CBO} Collector-Base Breakdown Voltage	$I_{CBO} = 5\mu\text{a}$ $I_E = 0$	25	—	—	v
BV_{CEO} Collector-Emitter Breakdown Voltage	$I_{CEO} = 2\text{ma}$ $I_B = 0$	25	—	—	v
BV_{EBO} Emitter-Base Breakdown Voltage	$I_{EBO} = 10\mu\text{a}$ $I_C = 0$	5	—	—	v
h_{FE} d-c Forward Current Transfer Ratio	$V_{CE} = 5\text{v}$ $I_C = 10\text{ma}$ $T_A = -55^{\circ}\text{C}$	12	—	—	—
h_{FE}^* d-c Forward Current Transfer Ratio	$V_{CE} = 5\text{v}$ $I_C = 10\text{ma}$	20	—	60	—
V_{BE}^* Base-Emitter Voltage	$V_{CE} = 5\text{v}$ $I_C = 10\text{ma}$	0.7	—	0.95	v
$V_{CE(sat)}^*$ Collector-Emitter Saturation Voltage	$I_C = 10\text{ma}$ $I_B = 1\text{ma}$	—	—	0.5	v
C_{ob} Output Capacitance	$V_{CB} = 5\text{v}$ $I_E = 0$ $f = 1\text{mc}$	—	3	6	μmf
f_t Frequency at which $ h_{fe} $ is unity	$V_{CE} = 5\text{v}$ $I_E = -10\text{ma}$	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.

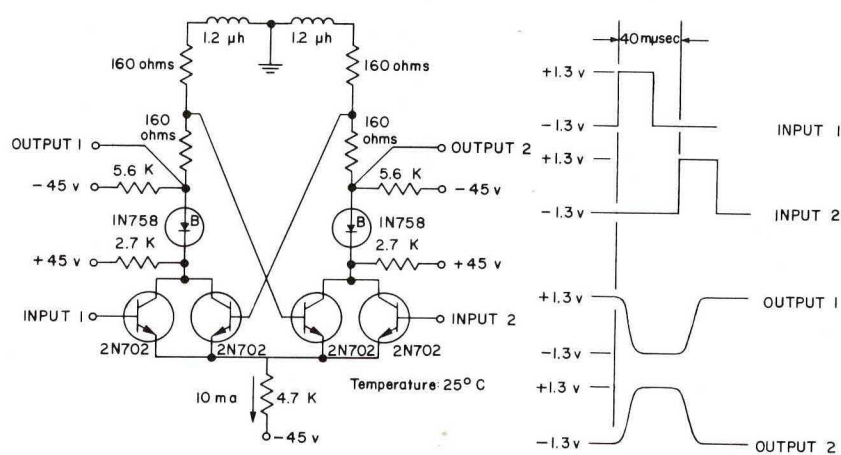
TYPE 2N702

SWITCHING CHARACTERISTICS

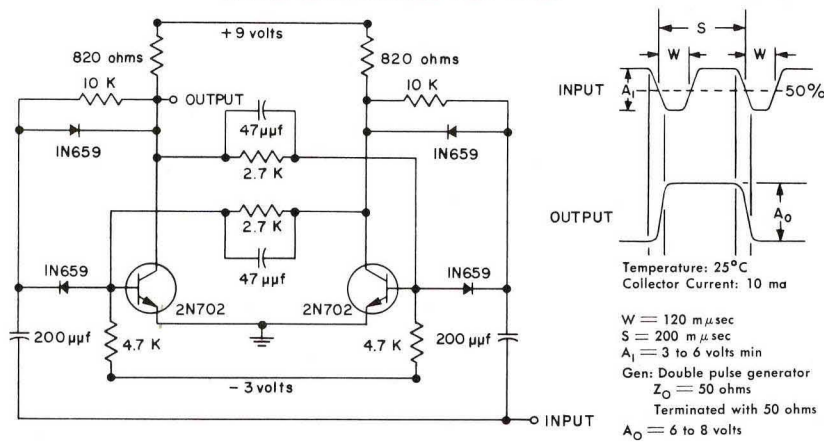
NON-SATURATED CURRENT SWITCHING CIRCUIT

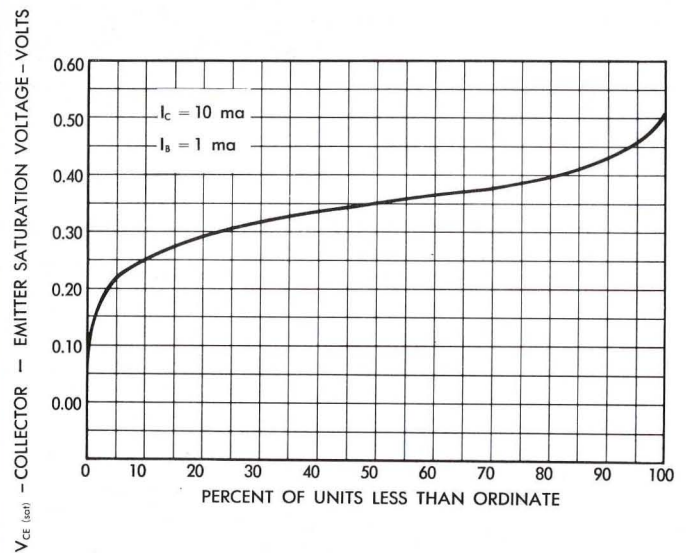
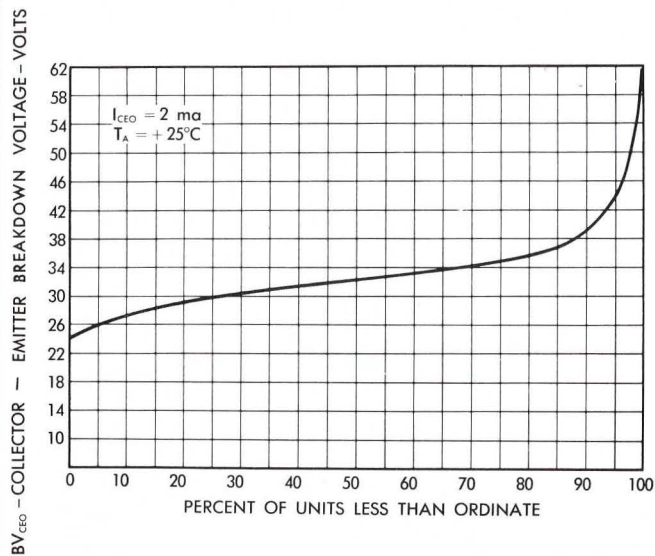
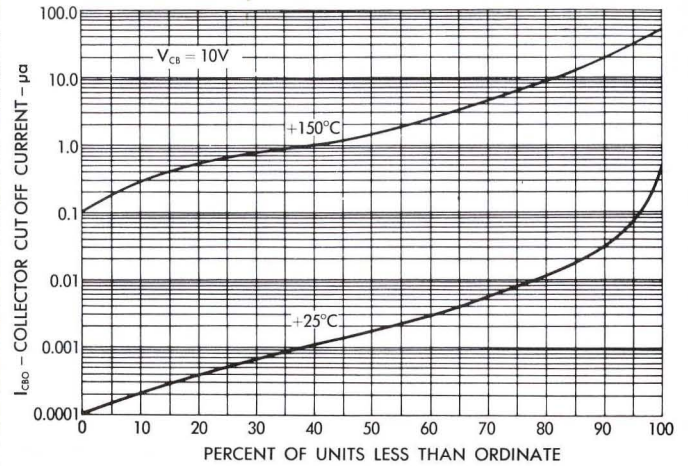
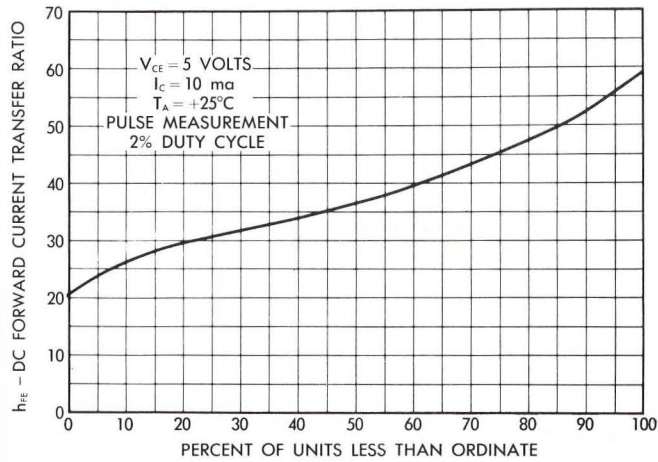


25-MC NON-SATURATED FLIP-FLOP



5-MC SATURATED FLIP-FLOP





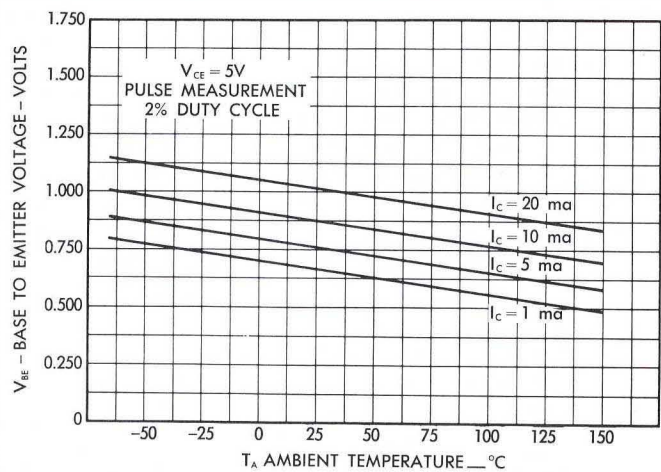
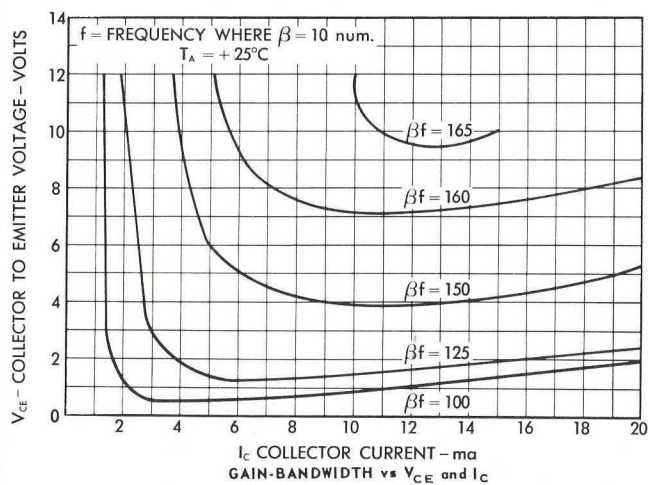
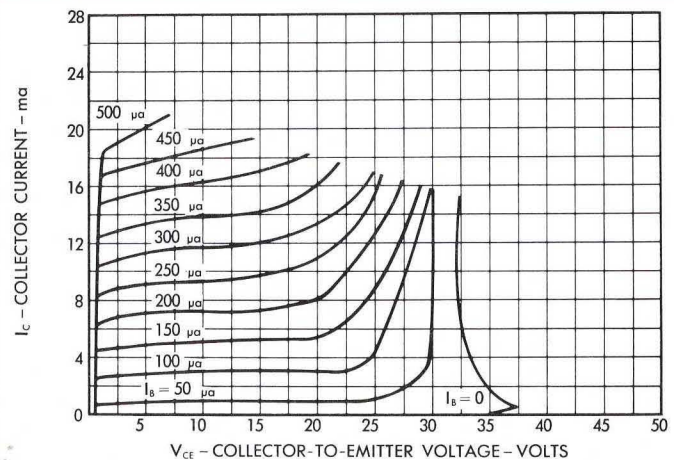
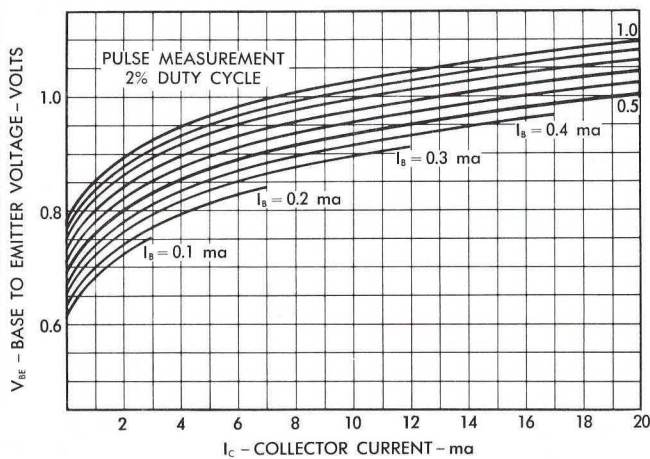
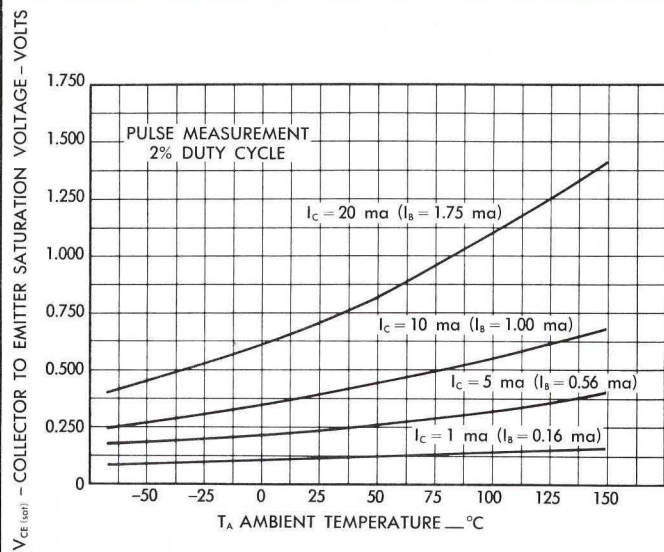
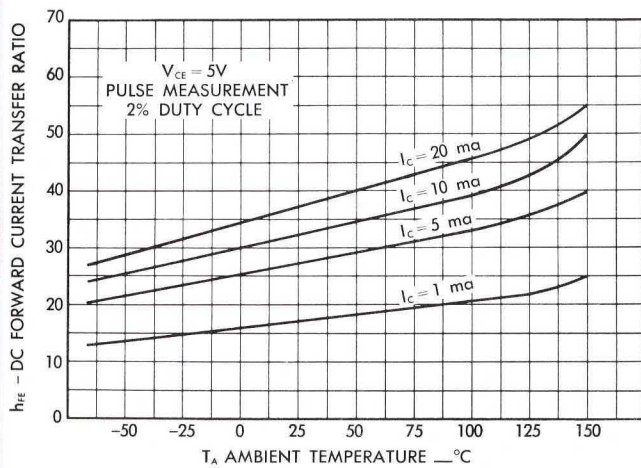
...ches unity when the base-emitter diode is open circuited.
 ...d in applications where the d-c circuit resistance between

...re at the rate of 0.25°C per milliwatt.
 ...ature at the rate of 0.50°C per milliwatt.



TYPE 2N702

TYPICAL CHARACTERISTICS



NOTE 1 - This is the voltage at which h_{FB} approaches unity. This value may sometimes be exceeded in applications where the base and emitter is a finite value.

NOTE 2 - Derate linearly to $175^{\circ}C$ case temperature at the maximum ambient temperature.

NOTE 3 - Derate linearly to $175^{\circ}C$ ambient temperature at the maximum case temperature.