2N1708 (SILICON)

CASE 26
(TO-46)

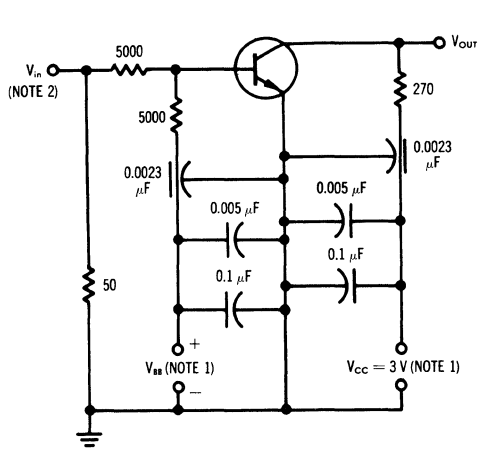
Collector electrically connected to case

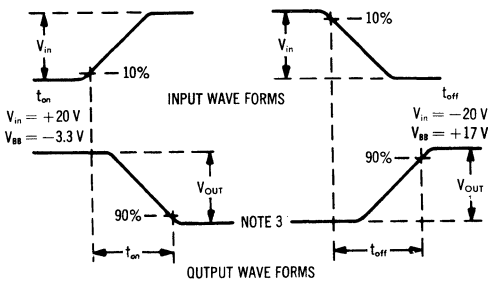
NPN silicon transistor designed for very high-speed, low-power saturated switching applications for computers in military and industrial service.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	12	Vdc
Collector-Base Voltage	V_{CB}	25	Vdc
Emitter-Base Voltage	V_{EB}	3.0	Vdc
Collector Current	I_C	200	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	300 2.0	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.0 6.67	Watt mW/°C
Operating Junction Temperature	T_J	+175	°C
Storage Temperature Range	T_{stg}	-65 to +200	°C

FIGURE 1 — TURN-ON AND TURN-OFF TIME TEST CIRCUIT





NOTE 1: With certain types of power supplies, it may be necessary to connect 25 μF decoupling capacitors across the power-supply terminals for V_{CC} and V_{BB}.

NOTE 2: Input voltage (V_{in}) obtained from a pulse generator having an output impedance of 50 ohms. V_{in} rise time ≤ 1.0 ns, pulse duration ≥ 300 ns, and duty factor ≤ 2.0%.

NOTE 3: Input and output waveforms, shown above, monitored by means of an oscilloscope having a rise time ≤ 0.5 ns, input capacitance of probe ≤ 2.5 pF with shunt resistance ≥ 3000 ohms.

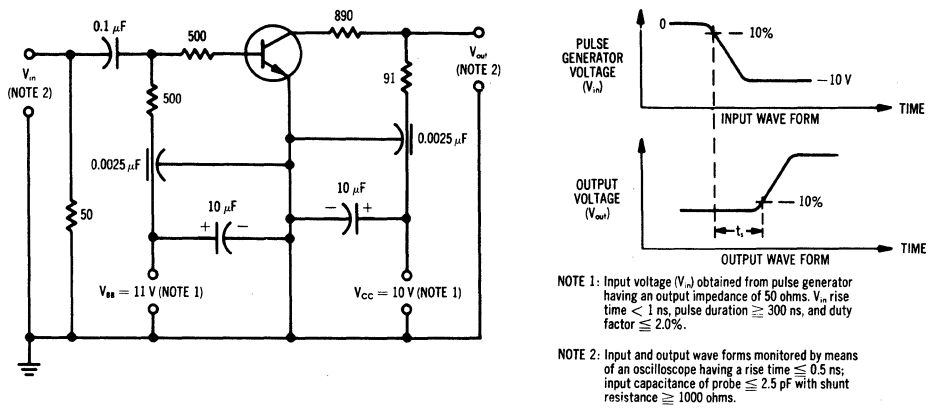
2N1708 (continued)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage* (I_C = 10 mAdc, I_B = 0)	$BV_{CEO(sus)}$*	12	-	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BV_{CBO}	25	-	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	BV_{EBO}	3.0	-	Vdc
Collector-Cutoff Current (V_{CE} = 10 Vdc, V_{BE} = 0.25 Vdc, T_A = 100°C)	I_{CEX}	-	15	μAdc
Collector Cutoff Current (V_{CB} = 15 Vdc, I_E = 0) (V_{CB} = 15 Vdc, I_E = 0, T_A = 150°C)	I_{CBO}	- -	0.025 15	μAdc
ON CHARACTERISTICS				
DC Current Gain* (I_C = 10 mAdc, V_{CE} = 1.0 Vdc)	h_{FE}	20	-	-
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc) (I_C = 50 mAdc, I_B = 5.0 mAdc)	$V_{CE(sat)}$	- -	0.22 0.35	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc)	$V_{BE(sat)}$	0.7	0.9	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain—Bandwidth Product (I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	f_T	200	-	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 140 kHz)	C_{ob}	-	6.0	pF
Turn-On Time (Figure 1) (I_C = 10 mAdc, I_{B1} = 3.0 mAdc, I_{B2} = 1.0 mAdc)	t_{on}	-	40	ns
Turn-Off Time (Figure 1) (V_{CC} = 3.0 Vdc, I_C = 10 mAdc, I_{B1} = 3.0 mAdc, I_{B2} = 1.0 mAdc)	t_{off}	-	75	ns
Storage Time (Figure 2) (I_C = 10 mAdc, I_{B1} = I_{B2} = 10 mAdc)	t_s	-	25	ns

* Pulse Test: Pulse Length ≤ 6.0 ms, Duty Cycle ≤ 30%.

FIGURE 2 — STORAGE TIME TEST CIRCUIT



NOTE 1: Input voltage (V_{in}) obtained from pulse generator having an output impedance of 50 ohms. V_{in} rise time < 1 ns, pulse duration ≥ 300 ns, and duty factor ≤ 2.0%.

NOTE 2: Input and output wave forms monitored by means of an oscilloscope having a rise time ≤ 0.5 ns; input capacitance of probe ≤ 2.5 pF with shunt resistance ≥ 1000 ohms.

2N1711

For Specifications, See 2N718A Data.