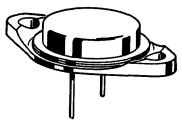
2N1751 (GERMANIUM)



Collector Connected to Case

CASE 3A
(TO-3 modified)

PNP Germanium power transistor designed for high-current switching applications requiring low saturation voltages, short switching times and good sustaining voltage capability.

- Alloy-Diffused Epitaxial Construction
- Low Saturation Voltages –
  $V_{CE(sat)}$ = 0.3 Vdc (Max) @ I_C = 20 Adc
  $V_{BE(sat)}$ = 0.7 Vdc (Max) @ I_C = 20 Adc

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	60	Vdc
*Collector-Base Voltage	V_{CB}	80	Vdc
*Emitter-Base Voltage	V_{EB}	2.5	Vdc
*Collector Current - Continuous	I_C	25	Adc
Base Current - Continuous	I_B	5.0	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	106 1.25	Watts W/°C
*Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +110	°C

THERMAL CHARACTERISTICS

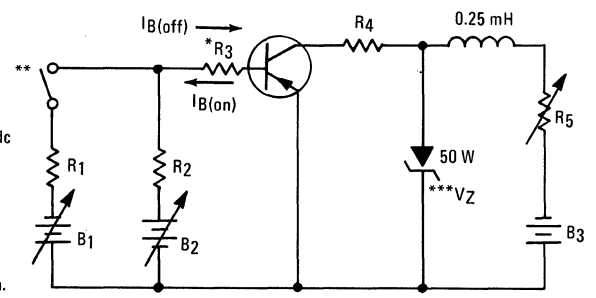
Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction to Case	θ_{JC}	0.8	°C/W

*Indicates JEDEC Registered Data.

FIGURE 1 – SUSTAINING VOLTAGE TEST CIRCUIT

R_1 = 1.0 Ohm, 20 Watts
R_2 = 10 Ohms, 2.0 Watts
R_3 = 0.1 Ohm, 1.0%
$R_4 \leq$ 0.04 Ohm

R_5: I_C Adjust @ $V_{CE} = V_Z$
B_1: Adjust for $I_{B(on)} = \frac{I_C}{10}$
B_2 = 2.0 Vdc, Adjust for $I_{B(off)}$ = 0.2 Adc
B_3 = 12 Vdc



*Not required if current probe is used to read I_B
**PRF ≈ 60 Hz
***Zener selected to establish Sustaining Voltage.
NOTE: Series impedance and inductance must be kept to a minimum. Adjust input pulse width for I_C = 25 A condition.

2N1751 (continued)

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C = 100 mAdc, I_B = 0)	BV_{CEO}	60	-	Vdc
Collector-Emitter Sustaining Voltage (See Figure 1) (I_C = 25 Adc)	$V_{CE(sus)}$	45	-	Vdc
*Floating Potential (V_{CB} = 80 Vdc, I_E = 0)	V_{EBF}	-	1.0	Vdc
Collector-Emitter Cutoff Current (V_{CE} = 80 Vdc, R_{BE} = 50 Ohms)	I_{CER}	-	50	mAdc
Collector Cutoff Current (V_{CE} = 80 Vdc, V_{BE} = 0)	I_{CES}	-	5.0	mAdc
Collector Cutoff Current (V_{CB} = 2.0 Vdc, I_E = 0)	I_{CBO1}	-	200	μAdc
Collector Cutoff Current *(V_{CB} = 80 Vdc, I_E = 0) (V_{CB} = 80 Vdc, I_E = 0, T_C = 100°C, +0, -3°C)	I_{CBO2}	- -	5.0 25	mAdc
*Emitter Cutoff Current (V_{EB} = 2.5 Vdc, I_C = 0)	I_{EBO}	-	50	mAdc
ON CHARACTERISTICS				
*DC Current Gain (I_C = 20 Adc, V_{CE} = 1.5 Vdc)	h_{FE}	30	90	-
Collector-Emitter Saturation Voltage (I_C = 20 Adc, I_B = 2.5 Adc)	$V_{CE(sat)}$	-	0.3	Vdc
Base-Emitter Saturation Voltage (I_C = 20 Adc, I_B = 2.5 Adc)	$V_{BE(sat)}$	-	0.7	Vdc
SMALL-SIGNAL CHARACTERISTICS				
* Common-Base Cutoff Frequency (I_C = 0.5 Adc, V_{CB} = 10 Vdc)	$f_{\alpha b}$	1.5	-	MHz
* Small-Signal Current Gain (I_C = 0.5 Adc, V_{CE} = 6.0 Vdc, f = 30 kHz)	h_{fe}	20	-	-
SWITCHING CHARACTERISTICS				
Rise Time	t_r	-	12	μs
Storage Time (I_C = 25 Adc, $I_{B(on)}$ = 2.5 Adc, $I_{B(off)}$ = 2.5 Adc) (See Figure 2)	t_s	-	10	μs
Fall Time	t_f	-	8.0	μs

*Indicates JEDEC Registered Data.

FIGURE 2 – SWITCHING TIME TEST CIRCUIT