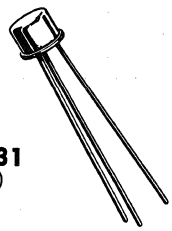
2N1959 (SILICON)



CASE 31
(TO-5)

Collector connected to case

NPN silicon annular transistor designed for high-speed, medium-power saturated switching applications.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage R_{BE} = 10 ohms	V_{CER}	40	Vdc
Collector-Base Voltage	V_{CB}	60	Vdc
Emitter-Base Voltage	V_{EB}	5	Vdc
Collector Current	I_C	500	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	600 4.0	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	2.0 1.3	Watts mW/°C
Operating Junction Temperature Range	T_J	-65 to +175	°C
Storage Temperature Range	T_{stg}	-65 to +200	°C

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C = 50 μAdc, R_{BE} = 10 ohms)	BV_{CER}	40	—	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BV_{CBO}	60	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	BV_{EBO}	5.0	—	Vdc
Collector Cutoff Current (V_{CB} = 30 Vdc, I_E = 0) (V_{CB} = 30 Vdc, I_E = 0, T_A = 150°C)	I_{CBO}	— —	0.5 300	μAdc
ON CHARACTERISTICS				
DC Current Gain (I_C = 150 mAdc, V_{CE} = 10 Vdc)	h_{FE}	40	120	—
Collector-Emitter Saturation Voltage (I_C = 150 mAdc, I_B = 15 mAdc)	$V_{CE(sat)}$	—	0.45	Vdc
Base-Emitter Saturation Voltage (I_C = 150 mAdc, I_B = 15 mAdc)	$V_{BE(sat)}$	—	1.3	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain—Bandwidth Product (I_C = 25 mAdc, V_{CB} = 10 Vdc, f = 100 MHz)	f_T	100	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1 MHz)	C_{ob}	—	18	pF
Turn-On Time	t_{on}	—	65	ns
Turn-Off Time	t_{off}	—	45	ns
Storage Time	t_s	—	25	ns

Figure 1 (V_{CC} = 7 Vdc, I_C = 150 mAdc, $I_{B1} = I_{B2}$ = 15 mAdc)

*t_{on}, t_{off}, and t_s measured from 50% point of input pulse.

FIGURE 1 — SWITCHING TIME TEST CIRCUIT