

2N2540

CASE 22, STYLE 1
TO-18

SWITCHING TRANSISTOR

NPN SILICON

4

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Emitter Voltage	V_{CER}	40	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	0.5 2.86	Watt mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.8 10.3	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 100\text{ mAdc}$, pulsed, $I_B = 0$)	$V_{(BR)CEO}$	30	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 100\text{ mAdc}$, pulsed, $R_{BE} \leq 10\ \Omega$)	$V_{(BR)CER}$	40	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10\ \mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	60	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\ \mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current ($V_{BE} = 0.2\text{ Vdc}$, $V_{CE} = 20\text{ Vdc}$)	I_{CEX}	—	0.250	μAdc
Collector Cutoff Current ($V_{CB} = 40\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 40\text{ Vdc}$, $I_E = 0$, $T_A = 150^\circ\text{C}$)	I_{CBO}	—	0.250 200	μAdc
Emitter Cutoff Current ($V_{EB} = 3.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	0.05	μAdc
Base Cutoff Current ($V_{BE} = 0.2\text{ Vdc}$, $V_{CE} = 20\text{ Vdc}$) ($V_{BE} = 0.2\text{ Vdc}$, $V_{CE} = 20\text{ Vdc}$, $T_A = 150^\circ\text{C}$)	I_{BL}	—	0.250 200	μAdc
ON CHARACTERISTICS(1)				
DC Forward Current Gain ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 150\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)(1) ($I_C = 500\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)(1)	h_{FE}	35 50 100 30	— — 300 —	—
SMALL-SIGNAL CHARACTERISTICS				
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$)	C_{obo}	—	8.0	pF
Input Capacitance ($V_{EB} = 0.5\text{ Vdc}$, $I_C = 0$, $f = 100\text{ kHz}$)	C_{ibo}	—	25	pF
Small-Signal Current Gain ($V_{CE} = 20\text{ Vdc}$, $I_C = 20\text{ mAdc}$, $f = 100\text{ MHz}$)	h_{fe}	2.5	—	—
SWITCHING CHARACTERISTICS				
Storage Time ($I_C = I_{B1} = I_{B2} = 20\text{ mAdc}$, $V_{CC} = 5.0\text{ V}$)	τ_S	—	20	ns
Active Region Time Constant	τ_A	—	2.0	ns
Turn-On Time ($I_{B1} = I_{B2} = 15\text{ mAdc}$, $I_C = 150\text{ mAdc}$, $V_{CC} = 7.0\text{ Vdc}$, $R_L = 40\ \Omega$)	t_{on}	—	40	ns
Turn-Off Time ($I_{B1} = I_{B2} = 15\text{ mAdc}$, $I_C = 150\text{ mAdc}$, $V_{CC} = 7.0\text{ Vdc}$, $R_L = 40\ \Omega$)	t_{off}	—	40	ns
Total Control Charge	Q_T	—	750	pC

(1) Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.