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TIP50

Silicon NPN Transistors

High Voltage Amp, Switch

TO-220 Type Package

Features:

- Collector-Emitter Sustaining Voltage: 250–400V (Min)
- 1A Rated Collector Current
- $f_T = 10\text{Mhz}$ (Min) @ $I_C = 200\text{mA}$

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	400V
Collector-Base Voltage, V_{CBO}	500V
Emitter-Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	
Continuous	1A
Pulse	2A
Base Current, I_B	600mA
Total Power Dissipation ($T_C = +25^\circ\text{C}$), P_D	40W
Derate Above 25°C	0.32W/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-65° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Case, R_{thJC}	3.125 $^\circ\text{C/W}$

Electrical Characteristics: ($T_C = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 30\text{mA}$, $I_B = 0$, Note 1	400	–	–	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 300\text{V}$, $I_B = 0$	–	–	1.0	mA
	I_{CES}	$V_{CE} = 500\text{V}$, $V_{EB} = 0$	–	–	1.0	mA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5\text{V}$, $I_C = 0$	–	–	1.0	mA
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 0.3\text{A}$	30	–	150	
		$V_{CE} = 10\text{V}$, $I_C = 1.0\text{A}$	10	–	–	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1\text{A}$, $I_B = 200\text{mA}$	–	–	1.0	V
Base-Emitter ON Voltage	$V_{BE(on)}$	$V_{CE} = 10\text{V}$, $I_C = 1\text{A}$	–	–	1.5	V
Dynamic Characteristics						
Current-Gain – Bandwidth Product	f_T	$V_{CE} = 10\text{V}$, $I_C = 0.2\text{A}$, $f_{test} = 2\text{Mhz}$, Note 2	10	–	–	MHz
Small-Signal Current Gain	h_{fe}	$V_{CE} = 10\text{V}$, $I_C = 0.2\text{A}$, $f = 1\text{kHz}$	25	–	–	

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Note 2. $F_T = |h_{fe}| \cdot f_{test}$.

