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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 $25^\circ\text{C}$ .....	0.32W/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	3.125 $^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
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
		$V_{CE} = 500\text{V}$ , $V_{EB} = 0$	–	–	1.0	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = 5\text{V}$ , $I_C = 0$	–	–	1.0	mA
<b>ON Characteristics (Note 1)</b>						
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
<b>Dynamic Characteristics</b>						
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.  $F_T = |h_{fe}| \cdot f_{test}$ .

