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## NTE394 Silicon NPN Transistor Power Amp, High Voltage Switch

**Description:**

The NTE394 is a silicon multiepitaxial mesa NPN transistor in a TO218 type package designed for use in high voltage, fast switching applications.

**Absolute Maximum Ratings:**

Collector–Emitter Voltage ( $V_{BE} = 0$ ), $V_{CES}$ .....	500V
Collector–Emitter Voltage ( $I_B = 0$ ), $V_{CEO}$ .....	400V
Emitter–Base Voltage ( $I_C = 0$ ), $V_{EB}$ .....	5V
Collector Current, $I_C$	
Continuous .....	3A
Peak .....	5A
Continuous Base Current, $I_B$ .....	600mA
Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_{tot}$ .....	100W
Operating Junction Temperature, $T_J$ .....	+150°C
Storage Temperature Range, $T_{stg}$ .....	–65° to +150°C
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	1.25°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector–Emitter Cutoff Current	$I_{CEO}$	$V_{CE} = 300V, I_B = 0$	–	–	1	mA
	$I_{CES}$	$V_{CE} = 500V, V_{EB} = 0$	–	–	1	mA
Emitter–Base Cutoff Current	$I_{EBO}$	$V_{EB} = 5V, I_C = 0$	–	–	1	mA
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 30mA, I_B = 0$ , Note 1	400	–	–	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 3A, I_B = 0.6A$ , Note 1	–	–	1.5	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 3A, V_{CE} = 10V$ , Note 1	–	–	1.5	V
DC Current Gain	$h_{FE}$	$I_C = 0.3A, V_{CE} = 10V$	30	150	–	
		$I_C = 3A, V_{CE} = 10V$	10	–	–	

Note 1. Pulse Test: Pulse Width = 300µs, Duty Cycle = 1.5%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Small-Signal Current Gain	$h_{fe}$	$I_C = 0.2\text{A}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	30	–	–	
		$I_C = 0.2\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	2.5	–	–	
Second Breakdown Unclamped Energy	$E_{s/b}$	$V_{BE} = 20\text{V}, R_{BE} = 100\Omega, I = 30\text{mA}$	100	–	–	mJ
Turn-On Time	$t_{on}$	$I_C = 1\text{A}, I_{B1} = 100\text{mA}, V_{CC} = 200\text{V}$	–	0.2	–	$\mu\text{s}$
Turn-Off Time	$t_{off}$	$I_C = 1\text{A}, I_{B1} = -I_{B2} = 100\text{mA}, V_{CC} = 200\text{V}$	–	0.2	–	$\mu\text{s}$

