

## NTE396

### Silicon NPN Transistor

### Power Amplifier & High Speed Switch

### (Compl to NTE397)

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	350V
Collector–Base Voltage, $V_{CBO}$ .....	450V
Emitter–Base Voltage, $V_{EBO}$ .....	7V
Continuous Collector Current, $I_C$ .....	1A
Base Current, $I_B$ .....	500mA
Total Device Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	1W
Derate Above $25^\circ\text{C}$ .....	5.7mW/ $^\circ\text{C}$
Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	5W
Derate Above $25^\circ\text{C}$ .....	28.6mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+200^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+200^\circ\text{C}$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	35 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	175 $^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 50\text{mA}$ , $I_B = 0$ , Note 1	350	–	–	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 300\text{V}$ , $I_B = 0$	–	–	20	$\mu\text{A}$
	$I_{CEX}$	$V_{CE} = 450\text{V}$ , $V_{BE} = 1.5\text{V}$	–	–	500	$\mu\text{A}$
	$I_{CBO}$	$V_{CB} = 360\text{V}$ , $I_E = 0$	–	–	20	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 6\text{V}$ , $I_C = 0$	–	–	20	$\mu\text{A}$
<b>ON Characteristics (Note 1)</b>						
DC Current Gain	$h_{FE}$	$I_C = 2\text{mA}$ , $V_{CE} = 10\text{V}$	30	–	–	
		$I_C = 20\text{mA}$ , $V_{CE} = 10\text{V}$	40	–	160	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 50\text{mA}$ , $I_B = 4\text{mA}$	–	–	0.5	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 50\text{mA}$ , $I_B = 4\text{mA}$	–	–	1.3	V

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

**CAUTION:** The sustaining voltage **must not** be measured on a curve tracer.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Small-Signal Characteristics</b>						
Current Gain-Bandwidth Product	$f_T$	$I_C = 10\text{mA}, V_{CE} = 10\text{V}, f = 50\text{MHz}$	15	–	–	MHz
Output Capacitance	$C_{obo}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	–	–	10	pF
Input Capacitance	$C_{ibo}$	$V_{CB} = 5\text{V}, I_C = 0, f = 1\text{MHz}$	–	–	75	pF
Small-Signal Current Gain	$h_{fe}$	$I_C = 5\text{mA}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	25	–	–	
Real Part of Input Impedance	$\text{Re}(h_{ie})$	$V_{CE} = 10\text{V}, I_C = 5\text{mA}, f = 1\text{MHz}$	–	–	300	$\Omega$

