

## NTE328 Silicon NPN Transistor Power Amp, Switch

**Description:**

The NTE328 is a silicon NPN transistor in a TO3 type package designed for use in industrial power amplifier and switching circuit applications.

**Features:**

- High Collector–Emitter Sustaining Voltage
- High DC Current Gain
- Low Collector–Emitter Saturation Voltage
- Fast Switching Times

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	120V
Collector–Base Voltage, $V_{CB}$ .....	140V
Emitter–Base Voltage, $V_{EB}$ .....	6V
Collector Current, $I_C$	
Continuous .....	25A
Peak .....	50A
Base Current, $I_B$ .....	10A
Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	200W
Derate Above $25^\circ\text{C}$ .....	1.14W/ $^\circ\text{C}$
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, $R_{thJC}$ .....	0.875 $^\circ\text{C}/\text{W}$

**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	$V_{CEO(sus)}$	$I_C = 50\text{mA}$ , $I_B = 0$ , Note 1	120	–	–	V
Collector Cutoff Current	$I_{CEX}$	$V_{CE} = 120\text{V}$ , $V_{BE(off)} = 1.5\text{V}$	–	–	10	mA
		$V_{CE} = 120\text{V}$ , $V_{BE(off)} = 1.5\text{V}$ , $T_C = +150^\circ\text{C}$	–	–	1.0	mA
	$I_{CEO}$	$V_{CE} = 60\text{V}$ , $I_B = 0$	–	–	50	$\mu\text{A}$
	$I_{CBO}$	$V_{CB} = 180\text{V}$ , $I_E = 0$	–	–	10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = 6\text{V}$ , $I_C = 0$	–	–	100	$\mu\text{A}$

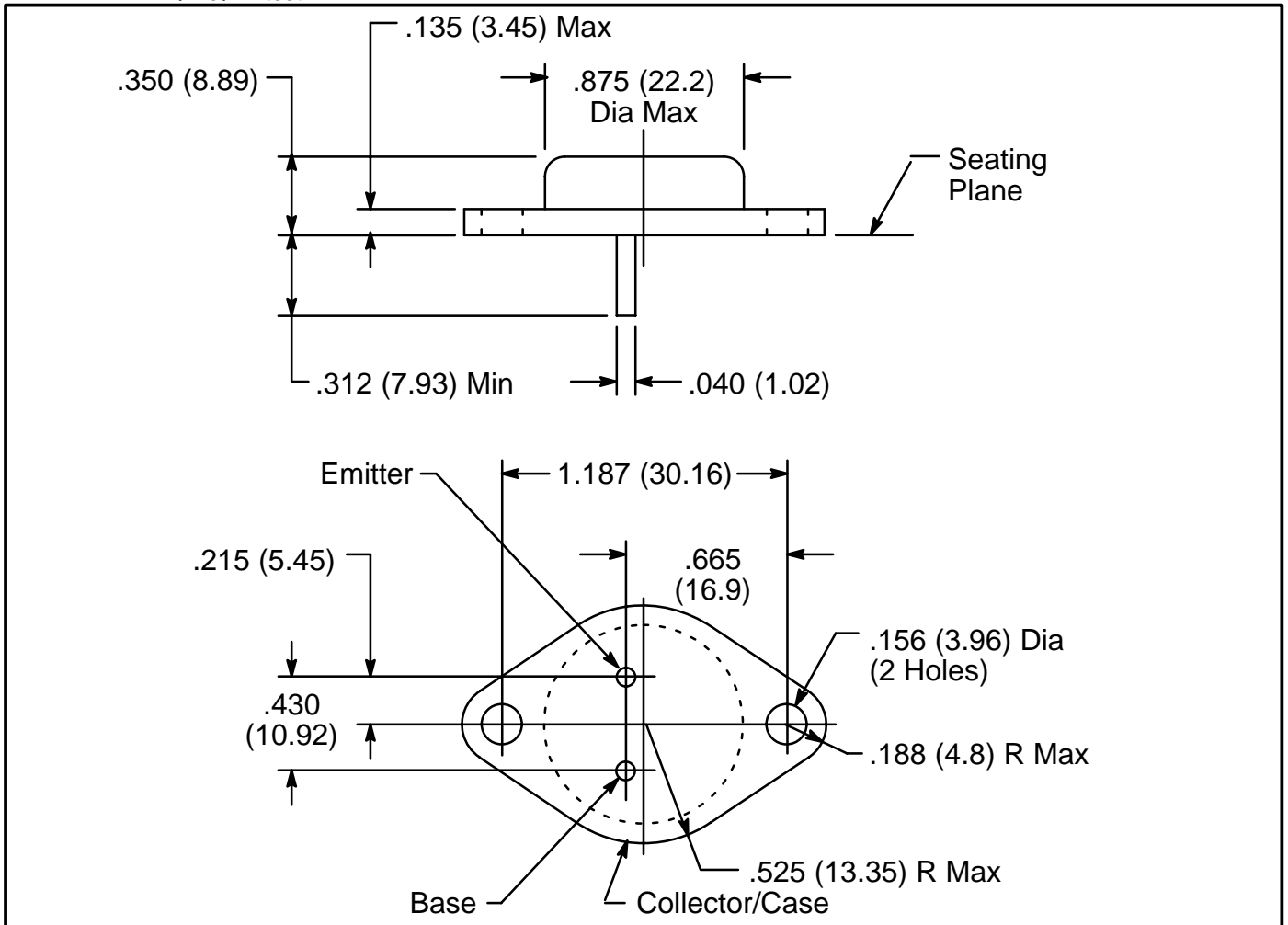
Note 1. Pulse test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics (Note 1)</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 2\text{V}, I_C = 0.5\text{A}$	50	-	-	
		$V_{CE} = 2\text{V}, I_C = 10\text{A}$	30	-	120	
		$V_{CE} = 2\text{V}, I_C = 25\text{A}$	12	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{A}, I_B = 1.0\text{A}$	-	-	1.0	V
		$I_C = 25\text{A}, I_B = 2.5\text{A}$	-	-	1.8	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{A}, I_B = 1.0\text{A}$	-	-	1.8	V
		$I_C = 25\text{A}, I_B = 2.5\text{A}$	-	-	2.5	V
Base-Emitter ON Voltage	$V_{BE(on)}$	$V_{CE} = 2\text{V}, I_C = 10\text{A}$	-	-	1.8	V
<b>Dynamic Characteristics</b>						
Current Gain-Bandwidth Product	$f_T$	$V_{CE} = 10\text{V}, I_C = 1\text{A}, f = 10\text{MHz}$ , Note 2	40	-	-	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$	-	-	300	pF
<b>Switching Characteristics</b>						
Rise Time	$t_r$	$V_{CC} = 80\text{V}, I_C = 10\text{A}, I_{B1} = 1\text{A}, V_{BE(off)} = 6\text{V}$	-	-	0.3	$\mu\text{s}$
Storage Time	$t_s$	$V_{CC} = 80\text{V}, I_C = 10\text{A}, I_{B1} = I_{B2} = 1\text{A}$	-	-	1.0	$\mu\text{s}$
Fall Time	$t_f$		-	-	0.25	$\mu\text{s}$

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

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



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