

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°C	1.14W/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-65° to $+200^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° 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
OFF Characteristics						
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	μA
	I_{CBO}	$V_{CB} = 180\text{V}$, $I_E = 0$	–	–	10	μA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 6\text{V}$, $I_C = 0$	–	–	100	μA

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
ON Characteristics (Note 1)						
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
Dynamic Characteristics						
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
Switching Characteristics						
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	μs
Storage Time	t_s	$V_{CC} = 80\text{V}, I_C = 10\text{A}, I_{B1} = I_{B2} = 1\text{A}$	-	-	1.0	μs
Fall Time	t_f		-	-	0.25	μs

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

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

