

NTE379 Silicon NPN Transistor Power Amp, High Voltage, Switch

Description:

The NTE379 is a silicon NPN transistor in a TO220 type package designed for high-voltage, high-speed power switching inductive circuits where fall time is critical. This device is particularly suited for 115 and 220V switch-mode applications such as Switching Regulators, Inverters, Motor Controls, Solenoid/Relay drivers, and Deflection circuits.

Features:

- $V_{CEO(sus)} = 400V$
- Reverse Bias SOA with Inductive Loads @ $T_C = +100^\circ C$
- 700V Blocking Capability

Absolute Maximum Ratings:

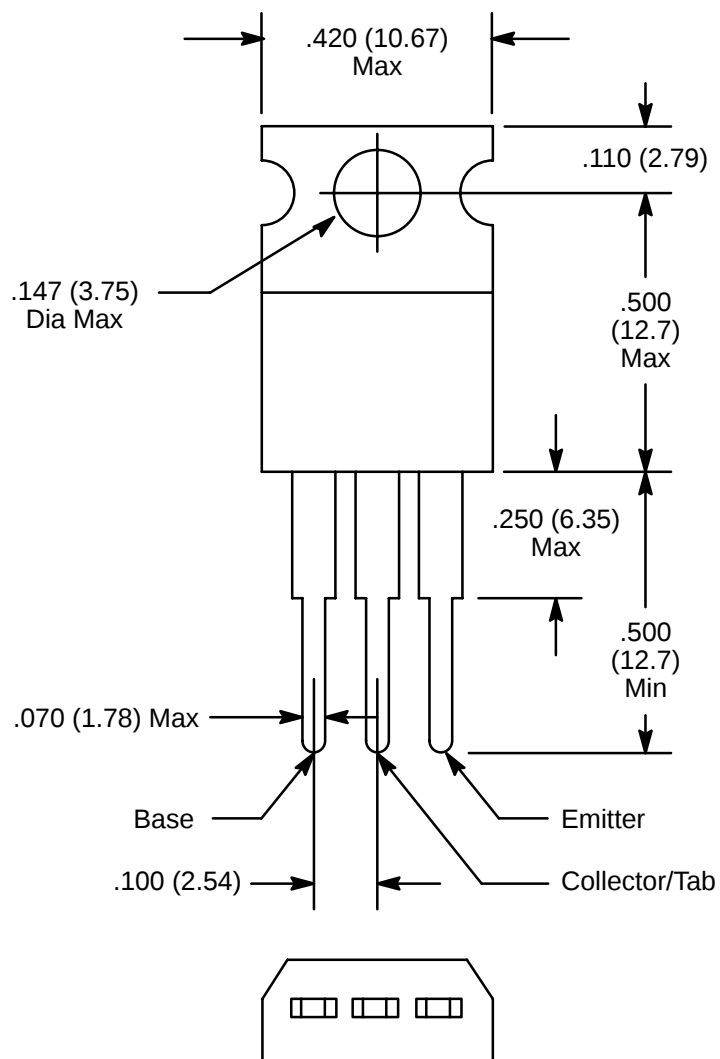
Collector-Emitter Voltage, $V_{CEO(sus)}$	400V
Collector-Emitter Voltage, V_{CEV}	700V
Emitter-Base Voltage, V_{EBO}	9V
Collector Current, I_C	
Continuous	12A
Peak (Note 1)	24A
Base Current, I_B	
Continuous	6A
Peak (Note 1)	12A
Emitter Current, I_E	
Continuous	18A
Peak (Note 1)	36A
Total Power Dissipation ($T_A = +25^\circ C$), P_D	2W
Derate Above $25^\circ C$	16mW/ $^\circ C$
Total Power Dissipation ($T_C = +25^\circ C$), P_D	100W
Derate Above $25^\circ C$	800mW/ $^\circ C$
Operating Junction Temperature Range, T_J	-65° to $+150^\circ C$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ C$
Thermal Resistance, Junction to Case, R_{thJC}	1.25 $^\circ C/W$
Thermal Resistance, Junction to Ambient, R_{thJA}	62.5 $^\circ C/W$
Lead Temperature (During Soldering, 1/8" from case for 5sec), T_L	$+275^\circ C$

Note 1. Pulse Test: Pulse Width = 5ms, Duty Cycle $\leq 10\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics (Note 2)						
Collector–Emitter Sustaining Voltage	V _{CEO(sus)}	I _C = 10mA, I _B = 0	400	–	–	V
Collector Cutoff Current	I _{CEV}	V _{CEV} = 700V, V _{BE(off)} = 1.5V	–	–	1	mA
		V _{CEV} = 700V, V _{BE(off)} = 1.5V, T _C = +100°C	–	–	5	mA
Emitter Cutoff Current	I _{EBO}	V _{EB} = 9V, I _C = 0	–	–	1	mA
ON Characteristics (Note 2)						
DC Current Gain	h _{FE}	I _C = 5A, V _{CE} = 5V	8	–	40	
		I _C = 8A, V _{CE} = 5V	6	–	30	
Collector–Emitter Saturation Voltage	V _{CE(sat)}	I _C = 5A, I _B = 1A	–	–	1.0	V
		I _C = 8A, I _B = 1.6A	–	–	1.5	V
		I _C = 12A, I _B = 3A	–	–	3.0	V
		I _C = 8A, I _B = 1.6A, T _C = +100°C	–	–	2.0	V
Base–Emitter Saturation Voltage	V _{BE(sat)}	I _C = 5A, I _B = 1A	–	–	1.2	V
		I _C = 8A, I _B = 1.6A	–	–	1.6	V
		I _C = 8A, I _B = 1.6A, T _C = +100°C	–	–	1.5	V
Dynamic Characteristics						
Current Gain–Bandwidth Product	f _T	I _C = 500mA, V _{CE} = 10V, f = 1MHz	4	–	–	MHz
Output Capacitance	C _{ob}	V _{CB} = 10V, I _E = 0, f = 0.1MHz	–	180	–	pF
Switching Characteristics						
Resistive Load						
Delay Time	t _d	V _{CC} = 125V, I _C = 8A, I _{B1} = I _{B2} = 1.6A, t _p = 25μs, Duty Cycle ≤ 1%	–	0.06	0.1	μs
Rise Time	t _r		–	0.45	1.0	μs
Storage Tme	t _s		–	1.3	3.0	μs
Fall Time	t _f		–	0.2	0.7	μs
Inductive Load, Clamped						
Voltage Storage Time	t _{sv}	I _C = 8A, V _{clamp} = 300V, I _{B1} = 1.6A, V _{BE(off)} = 5V, T _C = +100°C	–	0.92	2.3	μs
Crossover Time	t _c		–	0.12	0.7	μs

Note 2. Pulse Test: Pulse Width = $300\mu\text{s}$, Duty Cycle = 2%.



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