ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089

NTE2312
Silicon NPN Transistor
High Voltage, High Speed Switch

Description:

The NTE2312 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 115V and 220V switch–mode applications such as switching regulators, inverters, motor controls, solenoid/relay drivers, and deflection circuits.

Absolute Maximum Ratings:

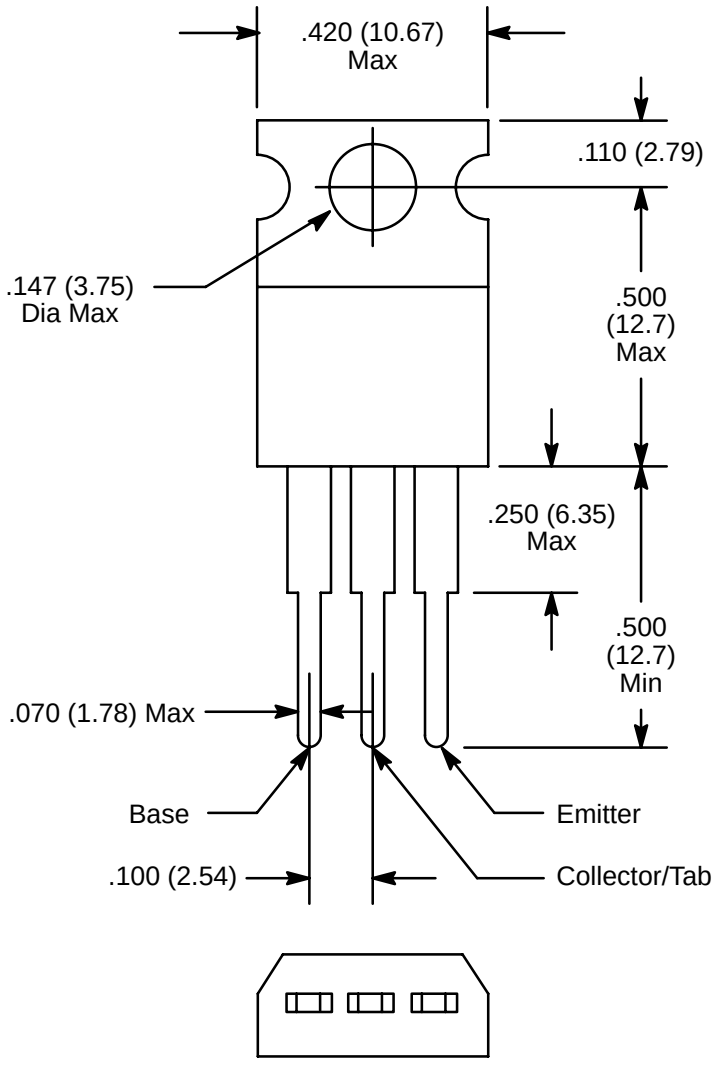
Collector–Emitter Voltage, $V_{CEO(sus)}$ 400V
Collector–Emitter Voltage, V_{CEV} 700V
Emitter–Base Voltage, V_{EBO} 9V
Collector Current, I_C
  Continuous 8A
  Peak (Note 1) 16A
Base Current, I_B
  Continuous 4A
  Peak (Note 1) 8A
Emitter Current, I_E
  Continuous 12A
  Peak (Note 1) 24A
Total Power Dissipation (T_A = +25°C), P_D 2W
  Derate Above 25°C . . . . . 16mW/°C
Total Power Dissipation (T_C = +25°C), P_D 80W
  Derate Above 25°C . . . . . 640mW/°C
Operating Junction Temperature Range, T_J . . . . . –65° to +150°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.56°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 62.5°C/W
Lead Temperature (During Soldering, 1/8” from case, 5sec), T_L . . . . . +275°C

Note 1. Pulse Test: Pulse Width = 5ms, Duty Cycle ≤ 10%.

Electrical Characteristics: (T_C = +25°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 = 2A, V_{CE} = 5V	8	–	60	
		I_C = 5A, V_{CE} = 5V	5	–	30	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 2A, I_B = 0.4A	–	–	1	V
		I_C = 5A, I_B = 1A	–	–	2	V
		I_C = 8A, I_B = 2A	–	–	3	V
		I_C = 5A, I_B = 1A, T_C = +100°C	–	–	3	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 2A, I_B = 0.4A	–	–	1.2	V
		I_C = 5A, I_B = 1A	–	–	1.6	V
		I_C = 5A, I_B = 1A, 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	–	110	–	pF
Switching Characteristics (Resistive Load)						
Delay Time	t_d	V_{CC} = 125V, I_C = 5A, I_{B1} = I_{B2} = 1A, t_p = 25µs, Duty Cycle ≤ 1%	–	0.05	0.1	µs
Rise Time	t_r		–	0.8	1.5	µs
Storage Time	t_s		–	1.0	3.0	µs
Fall Time	t_f		–	0.15	0.7	µs
Switching Characteristics (Inductive Load), Clamped						
Voltage Storage Time	t_{sv}	I_C = 5A, V_{clamp} = 300V, I_{B1} = 1A, $V_{BE(off)}$ = 5V, T_C = +100°C	–	0.86	2.3	µs
Crossover Time	t_c		–	0.14	0.7	µs

Note 2. Pulse Test: Pulse Width = 300µs, Duty Cycle = 2%.


.420 (10.67)
Max
.110 (2.79)
.147 (3.75)
Dia Max
.500
(12.7)
Max
.250 (6.35)
Max
.500
(12.7)
Min
.070 (1.78) Max
Base
Emitter
.100 (2.54)
Collector/Tab