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NTE2319
Silicon NPN Transistor
High Voltage, High Speed Power Switch

Description:

The NTE2319 is a silicon NPN transistor in a TO3 type package designed for high voltage, high speed, power switching in inductive circuits where fall time is critical. It is particularly suited for line–operated switchmode applications.

Features:

- Fast Turn–On Times @ T_C = +100°C:
  - Inductive Fall Time: 50ns Typ
  - Inductive Crossover Time: 90ns Typ
  - Inductive Storage Time: 800ns Typ
- 100°C Performance Specified for:
  - Reverse–Biased SOA with Inductive Loads
  - Switching Times with Inductive Loads
  - Saturation Voltages
  - Leakage Current

Applications:

- Switching Regulators
- Inverters
- Solenoids
- Relay Drivers
- Motor Controls
- Deflection Circuits

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO} 450V
Collector–Emitter Voltage, V_{CEV} 850V
Emitter–Base Voltage, V_{EB} 6V
Collector Current, I_C
- Continuous 15A
- Peak (Note 1) 20A

Base Current, I_B
- Continuous 10A
- Peak (Note 1) 15A

Total Device Dissipation, P_D
- T_C = +25°C 175W
- T_C = +100°C 100W
- Derate Above 25°C . . . . . 1W/°C

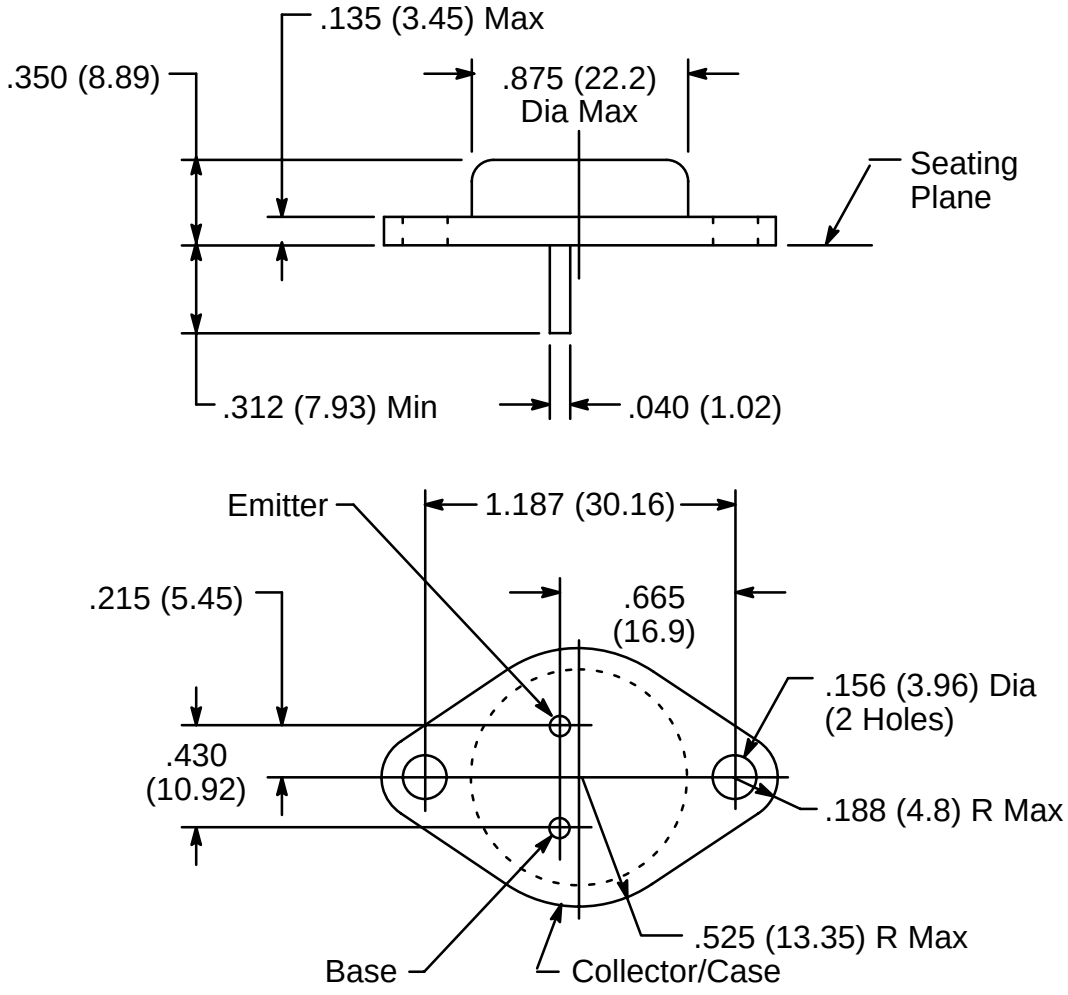
Operating Junction Temperature Range, T_J . . . . . –65° to +200°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1°C/W
Lead Temperature (During Soldering, 1/8” from case, 5sec), T_L . . . . . +275°C

Note 1. Pulse Test: Pulse Width ≤ 5μs, Duty Cycle ≥ 10%.

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
OFF Characteristics							
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	Table 2, I_C = 100mA, I_B = 0		450	–	–	V
Collector Cutoff Current	I_{CEV}	V_{CEV} = 850V, $V_{BE(off)}$ = 1.5V	T_C = +25°C	–	–	0.25	mA
			T_C = +100°C	–	–	1.5	mA
	I_{CER}	V_{CE} = 850V, R_{BE} = 50Ω, T_C = +100°C		–	–	2.5	mA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 6V, I_C = 0		–	–	1.0	mA
ON Characteristics (Note 2)							
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 5A, I_B = 700mA		–	–	2.5	V
		I_C = 10A, I_B = 1.3A	T_C = +25°C	–	–	3.0	V
			T_C = +100°C	–	–	3.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 10A, I_B = 1.3A	T_C = +25°C	–	–	1.5	V
			T_C = +100°C	–	–	1.5	V
DC Current Gain	h_{FE}	I_C = 15A, V_{CE} = 5V		5	–	–	
Dynamic Characteristics							
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f_{test} = 1kHz		–	–	400	pF
Switching Characteristics							
Resistive Load (Table 1)							
Delay Time	t_d	I_C = 10A, V_{CC} = 250V, I_{B1} = 1.3A, PW = 30νs, Duty Cycle ≤ 2%	I_{B2} = 2.6A, R_B = 1.6Ω	–	20	–	ns
Rise Time	t_r			–	200	–	ns
Storage Time	t_s			–	1200	–	ns
Fall Time	t_f			–	200	–	ns
Storage Time	t_s		$V_{BE(off)}$ = 5V	–	650	–	ns
Fall Time	t_f			–	80	–	ns
Inductive Load (Table 2)							
Storage Time	t_{sv}	I_C = 10A, I_{B1} = 1.3A, $V_{BE(off)}$ = 5V, $V_{CE(pk)}$ = 400V	T_C = +100°C	–	800	1800	ns
Fall Time	t_{fi}			–	50	200	ns
Crossover Time	t_c			–	90	250	ns
Storage Time	t_{sv}		T_C = +150°C	–	1050	–	ns
Fall Time	t_{fi}			–	70	–	ns
Crossover Time	t_c			–	120	–	ns

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


.135 (3.45) Max
.350 (8.89)
.875 (22.2)
Dia Max
Seating
Plane
.312 (7.93) Min
.040 (1.02)
Emitter
1.187 (30.16)
.215 (5.45)
.665
(16.9)
.156 (3.96) Dia
(2 Holes)
.430
(10.92)
.188 (4.8) R Max
.525 (13.35) R Max
Base
Collector/Case