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NTE251 (NPN) & NTE252 (PNP)
Silicon Complementary Transistors
Darlington Power Amplifier

Description:

The NTE251 (NPN) and NTE252 (PNP) are silicon complementary Darlington transistors in a TO3 type case designed for general–purpose amplifier and low–frequency switching applications.

Features:

- High DC Current Gain @ I_C = 10A:
  h_{FE} = 2400 Typ (NTE251)
  h_{FE} = 4000 Typ (NTE252)
- Collector–Emitter Sustaining Voltage: $V_{CEO(sus)}$ = 100V Min
- Monolithic Construction with Built–In Base–Emitter Shunt Resistors

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Collector–Emitter Voltage, V_{CEO} 100V

Collector–Base Voltage, V_{CB} 100V

Emitter–Base Voltage, V_{EB} 5V

Collector Current, I_C
- Continuous 20A
- Peak 40A

Base Current, I_B 500mA

Total Power Dissipation (T_C = +25°C), P_D 160W
- Derate Above 25°C . . . . . 0.915W/°C

Operating Junction Temperature Range, T_J . . . . . –65° to +200°C

Storage Temperature Range, T_{stg} . . . . . –65° to +200°C

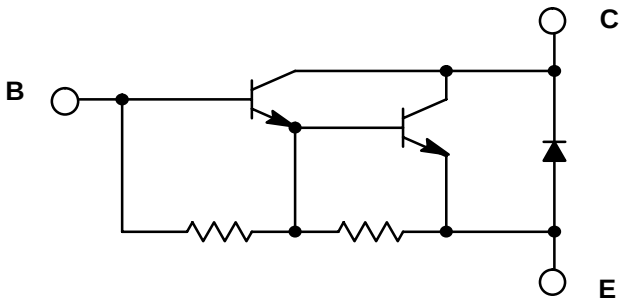
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.09°C/W

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

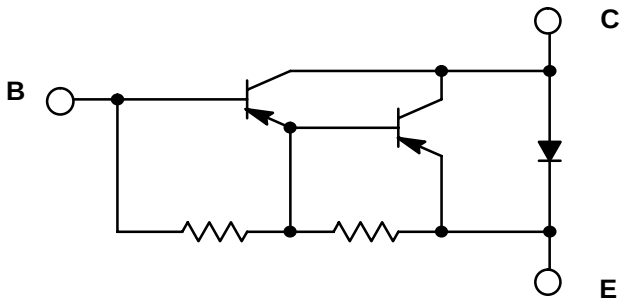
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter SustainingVoltage	$V_{CEO(sus)}$	I_C = 100mA, I_B = 0	100	–	–	V
Collector Cutoff Current	I_{CEO}	V_{CE} = 50V, I_E = 0	–	–	1.0	mA
	I_{CEX}	V_{CE} = 100V, $V_{BE(off)}$ = 1.5V	–	–	0.5	mA
		V_{CE} = 100V, $V_{BE(off)}$ = 1.5V, T_A = +150°C	–	–	5.0	mA
Emitter Cutoff Current	I_{EBO}	V_{BE} = 5V, I_C = 0	–	–	2.0	mA
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	V_{CE} = 3V, I_C = 10A	750	–	18000	
		V_{CE} = 3V, I_C = 20A	100	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10A, I_B = 40mA	–	–	2.0	V
		I_C = 20A, I_B = 200mA	–	–	3.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 20A, I_B = 200mA	–	–	4.0	V
Base–Emitter ON Voltage	$V_{BE(on)}$	V_{CE} = 3V, I_C = 10A	–	–	2.8	V
Dynamic Characteristics						
Small–Signal Current Gain	h_{fe}	V_{CE} = 3V, I_C = 10A, f = 1kHz	300	–	–	
Magnitude of Common Emitter Small–Signal Short–Circuit Forward Current Transfer Ratio	$\|h_{fe}\|$	V_{CE} = 3V, I_C = 10A, f = 1MHz	4.0	–	–	MHz
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0, f = 0.1MHz				pF
NTE251			–	–	400	
NTE252			–	–	600	

Note 1. Pulse Test: Pulse Width = 300μs, Duty Cycle = 2%

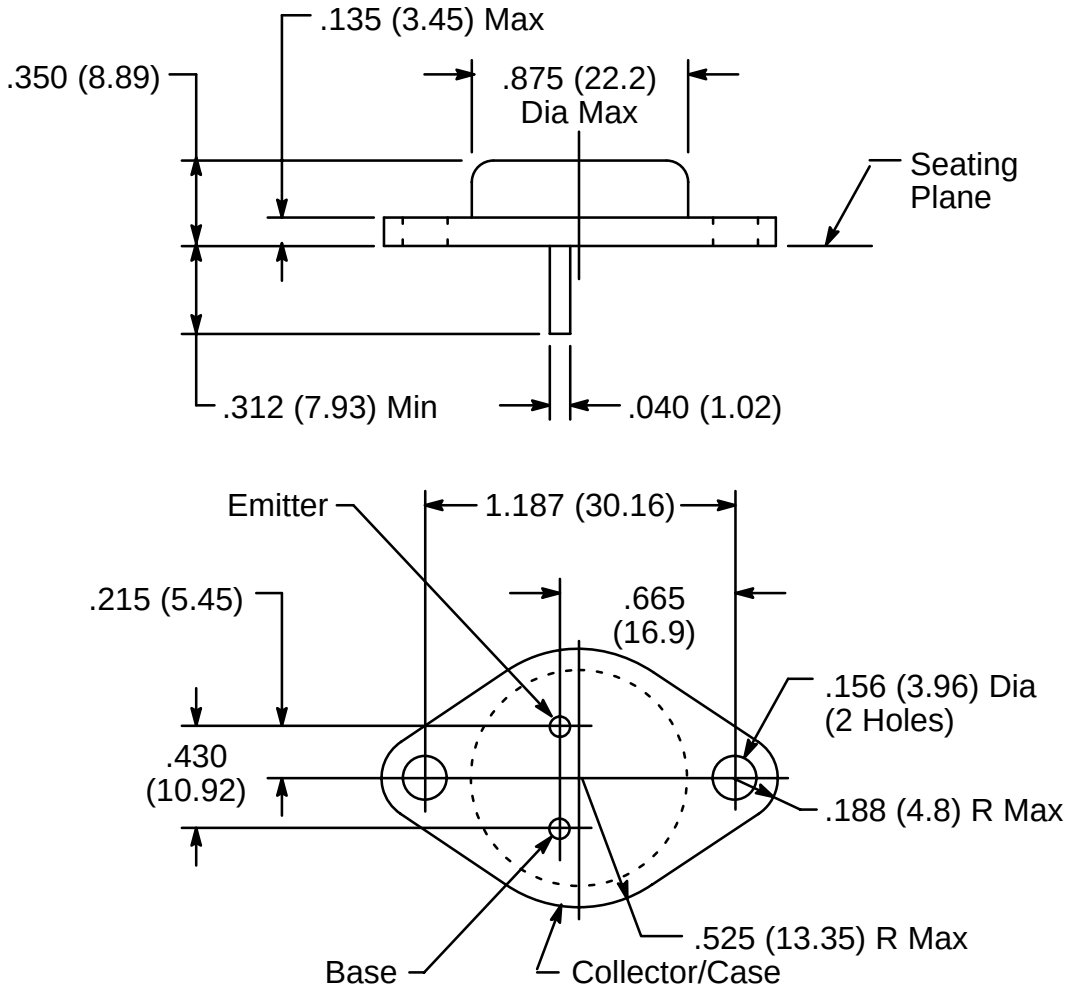
Schematic Diagram



NPN



PNP


.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