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NTE38 (PNP) & NTE175 (NPN)
Silicon Complementary Transistors
High Voltage, Medium Power Switch
TO66 Type Package

Description:

The NTE38 (PNP) and NTE175 (NPN) are complementary silicon transistors in a TO66 type package designed for high–speed switching and linear amplifier applications for high–voltage operational amplifiers, switching regulators, converters, inverters, deflection stages, and high fidelity amplifiers.

Features:

- TO66 Type Package
- Collector–Emitter Sustaining Voltage:
  NTE38: $V_{CEO(sus)}$ = 350V @ I_C = 200mA
  NTE175: $V_{CEO(sus)}$ = 300V @ I_C = 200mA
- Second Breakdown Collector Current:
  NTE38 $I_{S/b}$ = 875mA @ V_{CE} = 40V
  NTE175 $I_{S/b}$ = 350mA @ V_{CE} = 100V
- Usable DC Current Gain to 2.0Adc

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}
- NTE38 . . . . . 350V
- NTE175 . . . . . 300V

Collector–Base Voltage, V_{CB}
- NTE38 . . . . . 400V
- NTE175 . . . . . 500V

Emitter–Base Voltage, V_{EB} 6Vdc

Collector Current, I_C
- Continuous 2A
- Peak (Note 1) 5A

Base Current, I_B 1A

Total Power Dissipation (T_C = +25°C), P_D 35W
- Derate above 25°C . . . . . 0.2W/°C

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

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

Thermal Resistance, Junction to Case, $R_{\Theta JC}$ . . . . . 5°C/W

Note 1. Pulse Test (NTE175 Only): Pulse Width = 5ms, Duty Cycle ≤ 10%.

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

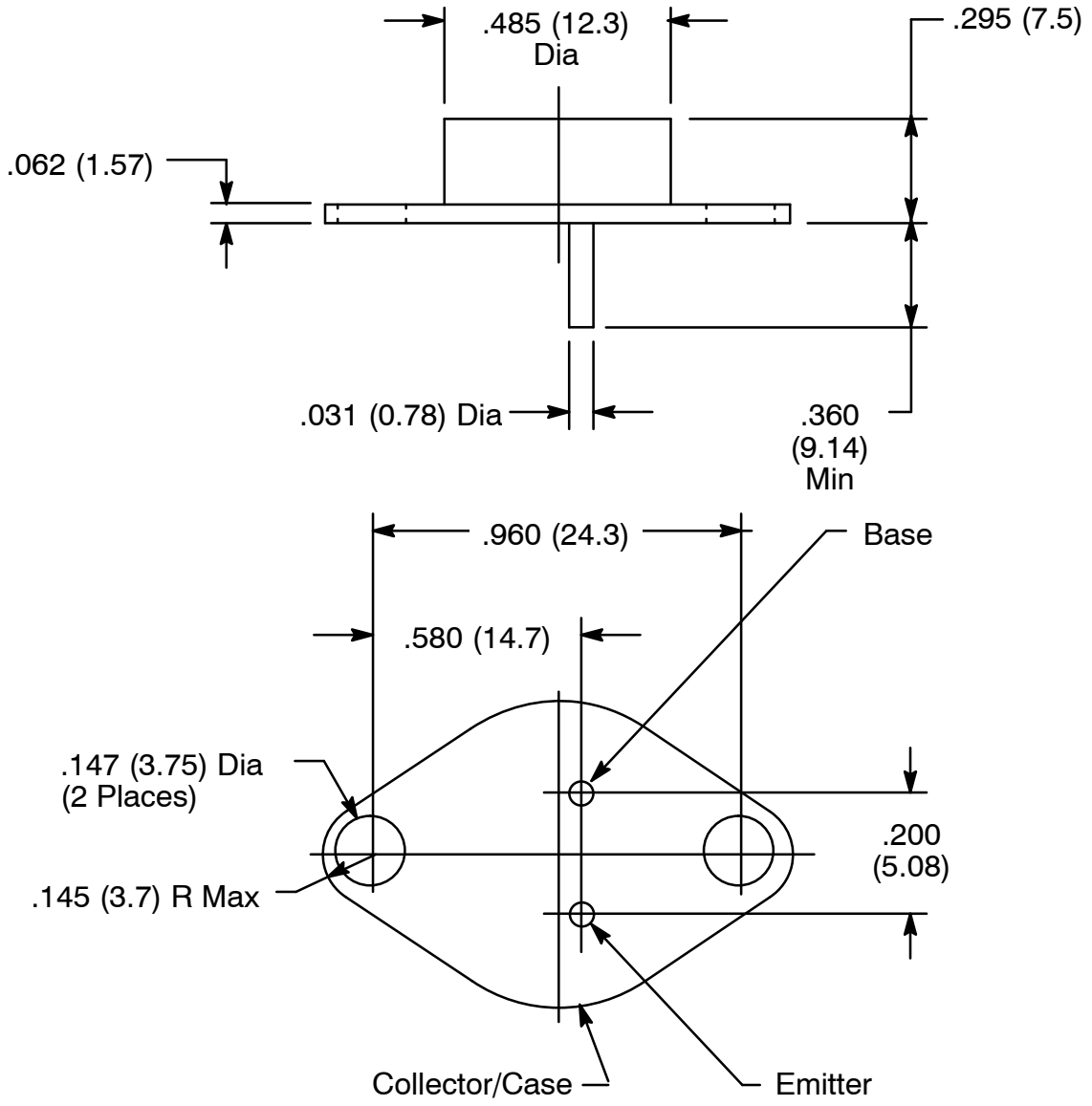
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics (Note 2)						
Collector−Emitter Sustaining Voltage NTE38	$V_{CEO(sus)}$	I_C = 200mA, I_B = 0	350	–	–	V
NTE175			300	–	–	V
Collector−Emitter Sustaining Voltage NTE38 Only	$V_{CEX(sus)}$	I_C = 200mA, V_{BE} = −1.5V, L = 10mH	400	–	–	V
	$V_{CER(sus)}$	I_C = 200mA, I_B = 0, R_{BE} = 50Ω	375	–	–	V
Emitter−Base Breakdown Voltage NTE38 Only	V_{EBO}	I_E = 0.5mA, I_C = 0	6	–	–	V
Collector Cutoff Current	I_{CEO}	V_{CE} = 150V, I_B = 0	–	–	5	mA
Collector Cutoff Current NTE38	I_{CEV}	V_{CE} = 250V, $V_{BE(off)}$ = 1.5V	–	–	0.5	mA
		V_{CE} = 250V, $V_{BE(off)}$ = 1.5V, T_C = +100°C	–	–	5.0	mA
		V_{CE} = 315V, $V_{BE(off)}$ = 1.5V	–	–	0.5	mA
		V_{CE} = 315V, $V_{BE(off)}$ = 1.5V, T_C = +100°C	–	–	5.0	mA
		V_{CE} = 360V, $V_{BE(off)}$ = 1.5V	–	–	0.5	mA
		V_{CE} = 360V, $V_{BE(off)}$ = 1.5V, T_C = +100°C	–	–	5.0	mA
NTE175	I_{CEX}	V_{CE} = 450V, $V_{BE(off)}$ = 1.5V	–	–	1.0	mA
		V_{CE} = 300V, $V_{BE(off)}$ = 1.5V, T_C = +150°C	–	–	3.0	mA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 6V, I_C = 0	–	–	0.5	mA
ON Characteristics (Note 2)						
DC Current Gain NTE38	h_{FE}	I_C = 1A, V_{CE} = 4V	10	–	100	
NTE175		I_C = 0.1A, V_{CE} = 10V	40	–	–	
		I_C = 1A, V_{CE} = 2V	8	–	80	
		I_C = 1A, V_{CE} = 10V	25	–	100	
Collector−Emitter Saturation Voltage NTE38	$V_{CE(sat)}$	I_C = 1A, I_B = 125mA	–	–	2.0	V
NTE175			–	–	0.75	V
Base−Emitter Saturation Voltage NTE38	$V_{BE(sat)}$	I_C = 1A, I_B = 125mA	–	–	1.4	V
NTE175		I_C = 1A, I_B = 100mA	–	–	1.4	V
Base−Emitter ON Voltage NTE175 Only	$V_{BE(on)}$	I_C = 1A, V_{CE} = 10V	–	–	1.4	V
Dynamic Characteristics						
Current Gain −Bandwidth Product NTE38	f_T	I_C = 200mA, V_{CE} = 10V, f_{test} = 5MHz, Note 3	20	–	–	MHz
NTE175			15	–	–	MHz
Output Capacitance (NTE175 Only)	C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	–	–	120	pF

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

Note 3. $f_T = |h_{fe}| \bullet f_{test}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Second Breakdown						
Second Breakdown Collector Current NTE38	$I_{S/b}$	t = 1s (Non–Repetitive), V_{CE} = 40V	875	–	–	mA
NTE175		V_{CE} = 100V	350	–	–	mA
Switching Characteristics						
NTE38 Rise Time	t_r	V_{CC} = 200V, I_C = 1A I_{B1} = I_{B2} = 125mA	–	–	0.6	µs
Storage Time	t_s		–	–	2.5	µs
Fall Time	t_f		–	–	0.6	µs
NTE175 Rise Time	t_r	V_{CC} = 200V, I_C = 1A; I_{B1} = 100mA, R_L = 200Ω	–	–	3.0	µs
Storage Time	t_s	I_{B1} = I_{B2} = 100mA	–	–	4.0	µs
Fall Time	t_f		–	–	3.0	µs



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