ELECTRONICS, INC.
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NTE100 (PNP) & NTE101 (NPN)
Germanium Complementary Transistors
Oscillator, Mixer for AM Radio,
Medium Speed Switch

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

Collector–Base Voltage, V_{CBO} 25V
Collector–Emitter Voltage (Note 1), V_{CEO}
NTE100 . . . . . 24V
NTE101 . . . . . 25V
Emitter–Base Voltage, V_{EBO}
NTE100 . . . . . 12V
NTE101 . . . . . 25V
Collector Current, I_C
NTE100 . . . . . 100mA
NTE101 . . . . . 300mA
Emitter Current (NTE100 Only), I_E 100mA
Total Device Dissipation, P_D 150mW
Derate Above 25°C . . . . . 2.5mW/°C
Operating Collector Junction Temperature, T_J . . . . . +85°C
Storage Temperature Range, T_{stg} . . . . . –65° to +100°C

Note 1. Punch–through voltage.

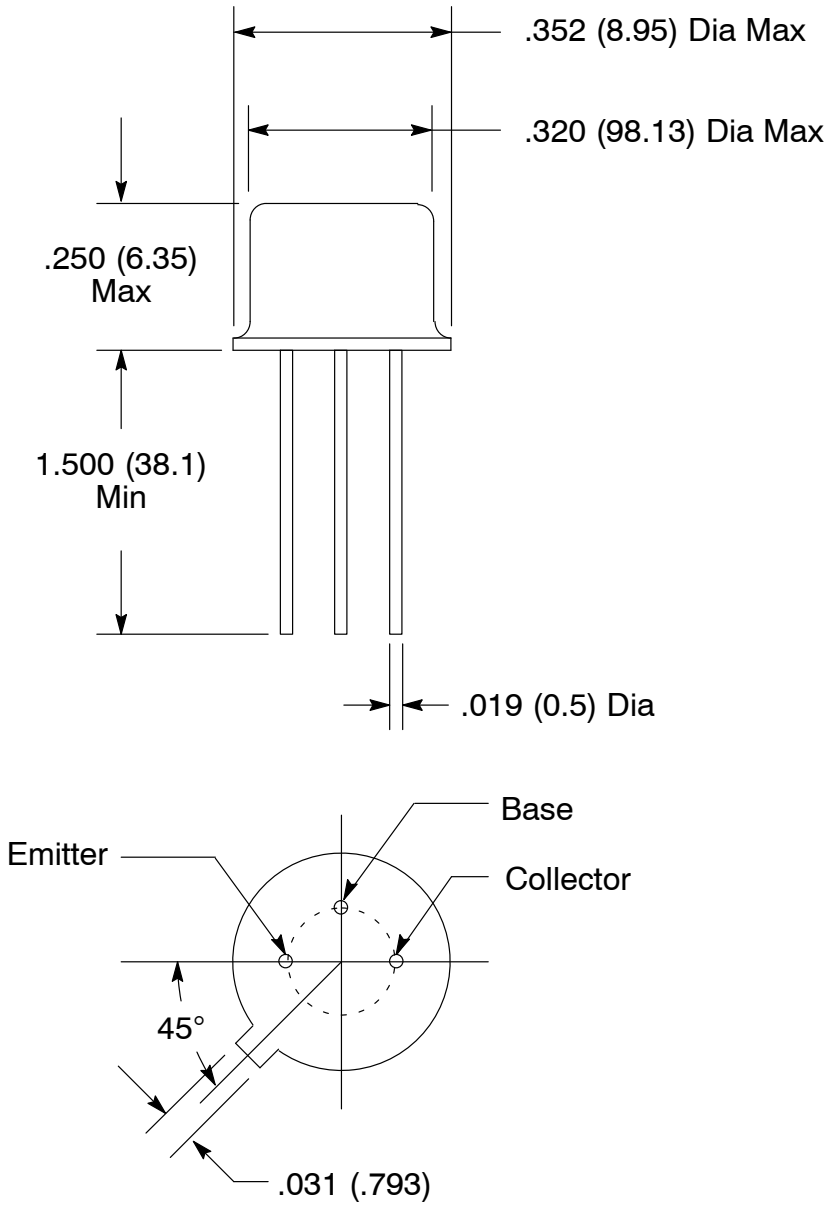
Electrical Characteristics: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Collector–Base Breakdown Voltage NTE100	$V_{(BR)CBO}$	I_E = 0	I_C = 20μA	25	–	–	V
NTE101			I_C = 100μA	25	–	–	V
Emitter–Base Breakdown Voltage NTE100	$V_{(BR)EBO}$	I_C = 0	I_E = 20μA	12	–	–	V
NTE101			I_E = 100μA	25	–	–	V
Punch Through Voltage NTE100	V_{PT}	V_{EBfl} = 1V, Note 2		24	–	–	V
NTE101				25	–	–	V
Collector Cutoff Current NTE100	I_{CBO}	I_E = 0	V_{CB} = 12V	–	1	5	μA
			V_{CB} = 12V, T_A = +80°C	–	40	90	μA
NTE101			V_{CB} = 25V	–	3	6	μA

Note 2. V_{PT} is determined by measuring the Emitter–Base floating potential V_{EBfl}. The Collector–Base Voltage, V_{CB}, is increased until V_{EBfl} = 1V; this value of V_{CB} = (V_{PT} + 1V). Care must be taken not to exceed maximum Collector–Base Voltage specified under maximum ratings.

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

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Emitter Cutoff Current NTE100	I_{EBO}	I_C = 0	V_{EB} = 2.5V	–	1	2.5	μA
NTE101			V_{EB} = 25V	–	2	6	μA
Static Forward Current Transfer Ratio NTE100	h_{FE}	V_{CE} = 0.15V, I_C = 12mA		30	100	–	
		V_{CE} = 0.20V, I_C = 24mA		24	110	–	
NTE101		V_{CE} = 1V, I_C = 10mA		20	100	–	
		V_{CE} = 0.35V, I_C = 200mA		10	100	–	
Base–Emitter Voltage NTE100	V_{BE}	I_B = 0.4mA, I_C = 12mA		–	0.26	0.35	V
		I_B = 1mA, I_C = 24mA		–	0.30	0.40	V
NTE101		I_B = 0.5mA, I_C = 10mA		0.15	0.22	0.40	V
Collector–Emitter Saturation Voltage NTE100	$V_{CE(sat)}$	I_B = 0.4mA, I_C = 12mA		–	0.08	0.15	V
		I_B = 1mA, I_C = 24mA		–	0.08	0.20	V
NTE101		I_B = 0.5mA, I_C = 10mA		–	0.07	0.20	V
Small–Signal Forward Current Transfer Ratio NTE100	h_{fe}	V_{CE} = 6V	I_C = 1mA, f = 1kHz	–	135	–	
NTE101		V_{CE} = 5V		–	105	–	
Output Capacitance NTE100	C_{ob}	V_{CB} = 6V	I_E = 0, f = 1MHz	–	9	20	pF
NTE101		V_{CB} = 5V		–	14	20	pF
Switching Characteristics							
Delay Time NTE100	t_d	I_C = 10mA, $I_{B(1)}$ = 1.3mA, $I_{B(2)}$ = 0.7mA, $V_{BE(off)}$ = 0.8V, R_L = 1kΩ		–	0.14	–	μs
NTE101				–	0.07	–	μs
Rise Time	t_r			–	0.20	–	μs
Storage Time NTE100	t_s			–	0.38	–	μs
NTE101				–	0.70	–	μs
Fall Time NTE100	t_f			–	0.19	–	μs
NTE101				–	0.40	–	μs
Stored Base Charge	Q_{sb}	$I_{B(1)}$ = 1mA, I_C = 10mA		–	800	1400	pcb


.352 (8.95) Dia Max
.320 (98.13) Dia Max
.250 (6.35)
Max
1.500 (38.1)
Min
.019 (0.5) Dia
Base
Emitter
Collector
45°
.031 (.793)