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

NTE108
Silicon NPN Transistor
High Frequency Amplifier

Description:

The NTE108 is a silicon NPN transistor in a TO92 type case designed for low–noise, high–frequency amplifiers, 1GHz local oscillatore, non–neutralized IF amplifiers, and non–saturating circuits with rise and fall times less than 2.5ns.

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO} 15V

Collector–Base Voltage, V_{CBO} 30V

Emitter–Base Voltage, V_{EBO} 3V

Continuous Collector Current, I_C 50mA

Total Device Dissipation (T_A = +25°C), P_D 625mW

Derate Above 25°C . . . . . 12mW/°C

Operating Junction Temperature Range, T_J . . . . . –55° to +150°C

Storage Temperature Range, T_{stg} . . . . . –55° to +150°C

Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . +83.3°C/W

Thermal Resistance, Junction–to–Ambient (Note 1), R_{thJA} . . . . . +200°C/W

Note 1. $R_{\Theta JA}$ is measured with the device soldered into a typical printed circuit board.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 3mA, I_B = 0, Note 2	15	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 1μA, I_E = 0	30	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	3	–	–	V
Collector Cutoff Current	I_{CBO}	V_{CB} = 15V, I_E = 0	–	–	10	nA

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics						
DC Current Gain	h_{FE}	I_C = 3mA, V_{CE} = 1V, Note 2	20	–	–	
		I_C = 8mA, V_{CE} = 10V, Note 2	20	–	200	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA	–	–	0.4	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 10mA, I_B = 1mA	–	–	1.0	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product	f_T	I_C = 4mA, V_{CE} = 10V, f = 100MHz, Note 2	600	–	–	MHz
Output Capacitance	C_{obo}	V_{CB} = 0V, I_E = 0, f = 140kHz	–	–	3.0	pF
		V_{CB} = 10V, I_E = 0, f = 140kHz	–	–	1.7	pF
Input Capacitance	C_{ibo}	V_{EB} = 0.5V, I_C = 0, f = 140kHz	–	–	2.0	pF
Noise Figure	NF	I_C = 1mA, V_{CE} = 6V, R_S = 400Ω, f = 60MHz	–	–	6	dB
Functional Test						
Common–Emitter Amplifier Power Gain	G_{pe}	I_C = 6mA, V_{CB} = 12V, f = 200MHz (G_{fd} + G_{re} < –20dB)	15	–	–	dB
Power Output	P_{out}	I_C = 8mA, V_{CB} = 15V, f = 500MHz	30	–	–	mW
Oscillator Collector Efficiency	η	I_C = 8mA, V_{CB} = 15V, P_{out} = 30mW, f = 500MHz	25	–	–	%

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