NTE ELECTRONICS, INC.

NTE199
Silicon NPN Transistor
Low Noise, High Gain Amplifier

Description:

The NTE199 is a silicon NPN transistor in a TO92 type package designed especially for low noise preamplifier and small signal industrial amplifier applications. This device features low collector saturation voltage, tight beta control, and excellent low noise characteristics.

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

Collector–Emitter Voltage, V_{CEO} 50V
Collector–Base Voltage, V_{CBO} 70V
Emitter–Base Voltage, V_{EBO} 5V
Steady State Collector Current (Note 1), I_C 100mA
Total Power Dissipation (T_A = +25°C), P_T 360mW
Derate Above +25°C . . . . . 3.3mW/°C
Total Power Dissipation (T_A = +55°C), P_T 260mW
Derate Above +25°C . . . . . 3.3mW/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +125°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Lead Temperature (During Soldering, 1/16” from case, 10sec max), T_L . . . . . +260°C

Note 1. Determined from power limitations due to saturation voltages at this current

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Collector Cutoff Current	I_{CBO}	V_{CB} = 50V	–	–	30	nA
		V_{CB} = 50V, T_A = +100°C	–	–	10	µA
Collector Cutoff Current	I_{CES}	V_{CB} = 50V	–	–	30	nA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 5V	–	–	50	nA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics (Cont'd)						
Forward Current Transfer Ratio	h_{FE}	V_{CE} = 5V, I_C = 2mA	400	–	800	
		V_{CE} = 5V, I_C = 100μA, Note 2	–	300	–	
Breakdown Voltage Collector–to–Emitter	$V_{(BR)CEO}$	I_C = 10mA, Note 3	50	–	–	V
Breakdown Voltage Collector–to–Base	$V_{(BR)CBO}$	I_C = 10μA	70	–	–	V
Breakdown Voltage Emitter–to–Base	$V_{(BR)EBO}$	I_E = 10μA	5	–	–	V
Collector Saturation Voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA, Note 3	–	–	0.125	V
Base Saturation Voltage	$V_{BE(sat)}$	I_C = 10mA, I_B = 1mA, Note 3	–	–	0.78	V
Base Emitter ON Voltage	$V_{BE(on)}$	V_{CE} = 10V, I_C = 2mA	0.5	–	0.9	V
Dynamic Characteristics						
Forward Current Transfer Ratio	h_{fe}	V_{CE} = 5V, I_C = 2mA, f = 1kHz	400	–	1200	
Output Capacitance, Common Base	C_{cb}	V_{CB} = 10V, I_E = 0, f = 1kHz	–	–	4	pF
Noise Figure	NF	I_C = 100μA, V_{CE} = 5V, R_g = 5kΩ, f = 1kHz	–	–	3	dB

Note 2. Typically, a minimum of 95% of the distribution is above this value.

Note 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%