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NTE172A
Silicon NPN Transistor
Darlington Preamp, Medium Speed Switch

Description:

The NTE172A is a silicon NPN Darlington transistor in a TO92 type case designed for preamplifier input stages requiring input impedances of several megohms or extremely low level, high gain, low noise amplifier applications.

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

Collector–Base Voltage, V_{CBO} 40V
Collector–Emitter Voltage, V_{CEO} 40V
Emitter–Base Voltage, V_{EBO} 12V
Collector Current, I_C
  Continuous 300mA
  Pulsed (Note 1) 500mA
Base Current, I_B 50mA
Total Power Dissipation (T_A = +25°C), P_D 400mW
  Derate Above 25°C . . . . . 4mW/°C
Operating Junction Temperature Range, T_J . . . . . –65° to +125°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Lead Temperature (During Soldering, 1/16” ±1/32” from case for 10sec max.), T_L . . . . . +260°C

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 0.1μA, I_E = 0	40	–	–	V
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	40	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 0.1μA, I_E = 0	12	–	–	V
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 2mA	7000	–	70000	
		V_{CE} = 5V, I_C = 100mA	20000	–	–	
Collector Cutoff Current	I_{CBO}	V_{CB} = 40V, I_E = 0	–	–	100	nA
		V_{CB} = 40V, I_E = 0, T_A = +100°C	–	–	20	μA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics (Cont'd)						
Emitter Cutoff Current	I_{EBO}	V_{EB} = 12V, I_C = 0	–	–	100	nA
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 200mA, I_B = 0.2mA	–	–	1.4	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 200mA, I_B = 0.2mA	–	–	1.6	V
Base–Emitter Voltage	V_{BE}	V_{CE} = 5V, I_C = 200mA	–	–	1.5	V
Dynamic Characteristics						
Small–Signal Current Gain	h_{fe}	V_{CE} = 5V, I_C = 2mA, f = 1kHz	7000	–	–	
Current Gain–High Frequency	$\|h_{fe}\|$	V_{CE} = 5V, I_C = 2mA, f = 1kHz	15.6	–	–	dB
Current Gain–Bandwidth Product	f_T	V_{CE} = 5V, I_C = 2mA, f = 10MHz	60	–	–	MHz
Input Impedance	h_{ie}	V_{CE} = 5V, I_C = 2mA, f = 1kHz	–	650	–	kΩ
Collector–Base Capacitance	C_{cb}	V_{CB} = 10V, f = 1MHz	–	7.6	10.0	pF
Emitter Capacitance	C_{eb}	V_{EB} = 0.5V, f = 1MHz	–	10.5	–	pF
Noise Voltage	$\bar{e_n}$	I_C = 0.6mA, V_{CE} = 5V, R_G = 160kΩ, f = 10Hz to 10kHz, B.W. = 15.7kHz	–	195	230	nV/$\sqrt{Hz}$