



NTE194 Silicon NPN Transistor Audio Power Amplifier

Description:

The NTE194 is a silicon NPN amplifier transistor packaged in a standard TO92 case.

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	160V
Collector–Base Voltage, V_{CBO}	180V
Emitter–Base Voltage, V_{EBO}	6V
Continuous Collector Current, I_C	600mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	350mW
Derate above 25°C	2.8mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	1.0W
Derate above 25°C	8.0mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, R_{thJC}	125 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Ambient (Note 1), R_{thJA}	357 $^\circ\text{C}/\text{W}$

Note 1 R_{thJA} is measured with the device soldered into a typical printed circuit board.

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$, $I_B = 0$, Note 2	180	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$, $I_E = 0$	180	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	6	–	–	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 120\text{V}$, $I_E = 0$	–	–	50	nA
		$V_{CB} = 120\text{V}$, $I_E = 0$, $T_A = +100^\circ\text{C}$	–	–	50	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 4\text{V}$, $I_C = 0$	–	–	50	nA

Note 2 Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 2)						
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 1\text{mA}$	80	–	–	
		$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	80	–	250	
		$V_{CE} = 5\text{V}, I_C = 50\text{mA}$	30	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	–	–	0.15	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$	–	–	0.20	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	–	–	1.0	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$	–	–	1.0	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product	f_T	$V_{CE} = 10\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$	100	–	300	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	–	–	6	pF
Input Capacitance	C_{ibo}	$V_{BE} = 0.5\text{V}, I_C = 0, f = 1\text{MHz}$	–	–	20	pF
Small–Signal Current Gain	h_{fe}	$V_{CE} = 10\text{V}, I_C = 1\text{mA}, f = 1\text{kHz}$	50	–	200	
Noise Figure	NF	$V_{CE} = 5\text{V}, I_C = 250\mu\text{A}, R_S = 1\text{k}\Omega, f = 10\text{Hz to } 15.7\text{kHz}$	–	–	8.0	dB

Note 2 Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.

