

NTE159

Silicon PNP Transistor

Audio Amplifier, Switch

(Compl to NTE123AP)

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	80V
Collector-Base Voltage, V_{CBO}	80V
Emitter-Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	800mA
Total Device Dissipation ($T_A = 25^\circ\text{C}$), P_D	625mW
Derate Above 25°C	5mW/ $^\circ\text{C}$
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, $R_{\theta JC}$	83.3 $^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient, $R_{\theta JA}$	200 $^\circ\text{C/W}$

Note 1. Matched complementary pairs are available upon request (NTE159MCP). Matched complementary pairs have their gain specification (h_{FE}) matched to within 10% of each other.

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	$V_{(BR)CEO}$	$I_C = 10\text{mA}$, $I_B = 0$, Note 2	80	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$, $I_E = 0$	80	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	5	-	-	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 50\text{V}$, $I_E = 0$	-	-	50	nA
		$V_{CB} = 50\text{V}$, $I_E = 0$, $T_A = +75^\circ\text{C}$	-	-	5	μA
Emitter Cutoff Current	I_{EBO}		-	-	100	nA
ON Characteristics (Note 2)						
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 100\mu\text{A}$	25	-	-	
		$V_{CE} = 10\text{V}$, $I_C = 1\text{mA}$	40	-	-	
		$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$	50	-	250	
		$V_{CE} = 10\text{V}$, $I_C = 100\text{mA}$	40	-	-	
		$V_{CE} = 10\text{V}$, $I_C = 500\text{mA}$	30	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}$, $I_B = 15\text{mA}$	-	-	0.15	V
		$I_C = 500\text{mA}$, $I_B = 50\text{mA}$	-	-	0.5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{mA}$, $I_B = 15\text{mA}$	-	-	0.9	V
		$I_C = 500\text{mA}$, $I_B = 50\text{mA}$	-	-	1.1	V

Note 2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Dynamic Characteristics						
Output Capacitance	C_{ob}	$V_{CB} = 20\text{V}, I_E = 0, f = 1\text{MHz}$	-	-	30	pF
Input Capacitance	C_{ib}	$V_{BE} = 500\text{mV}, f = 1\text{MHz}$	-	-	110	pF
Small-Signal Current Gain	h_{fe}	$I_C = 500\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$	1	-	5	
Noise Figure	NF	$I_C = 100\text{mA}, V_{CE} = 10\text{V}, R_S = 1\text{k}\Omega, f = 1\text{kHz}, B_W = 1\text{Hz}$	-	-	3	dB
Switching Characteristics						
Turn-On Time	t_{on}	$V_{CC} = 30\text{V}, I_C = 500\text{mA}, I_{B1} = I_{B2} = 50\text{mA}$	-	-	100	ns
Turn-Off Time	t_{off}		-	-	400	ns

