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NTE123AP
Silicon NPN Transistor
Audio Amplifier, Switch
(Compl to NTE159)

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	40V
Collector-Base Voltage, V_{CB}	60V
Emitter-Base Voltage, V_{EB}	6V
Continuous Collector Current, I_C	600mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	625mW
Derate Above 25°C	5.0mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	1.5W
Derate Above 25°C	12mW/ $^\circ\text{C}$
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}	83.3° $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient, R_{thJA}	200° $^\circ\text{C}/\text{W}$

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 1	40	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 0.1\text{mA}$, $I_E = 0$	60	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 0.1\text{mA}$, $I_C = 0$	6	-	-	V
Collector Cutoff Current	I_{CEV}	$V_{CE} = 35\text{V}$, $V_{EB(off)} = 0.4\text{V}$	-	-	0.1	μA
Base Cutoff Current	I_{BEV}	$V_{CE} = 35\text{V}$, $V_{EB(off)} = 0.4\text{V}$	-	-	0.1	μA
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	$V_{CE} = 1\text{V}$, $I_C = 0.1\text{mA}$	20	-	-	
		$V_{CE} = 1\text{V}$, $I_C = 1\text{mA}$	40	-	-	
		$V_{CE} = 1\text{V}$, $I_C = 10\text{mA}$	80	-	-	
		$V_{CE} = 1\text{V}$, $I_C = 150\text{mA}$	100	-	300	
		$V_{CE} = 1\text{V}$, $I_C = 500\text{mA}$	40	-	-	

Note 1. 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
ON Characteristics (Note 1) (Cont'd)						
Collector-Emitter Saturation Voltage	$V_{CE(\text{sat})}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	-	0.4	V
		$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	-	0.75	V
Base-Emitter Saturation Voltage	$V_{BE(\text{sat})}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	0.75	-	0.95	V
		$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	-	1.2	V
Small-Signal Characteristics						
Current Gain-Bandwidth Product	f_T	$I_C = 20\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$	250	-	-	MHz
Collector-Base Capacitance	C_{cb}	$V_{CB} = 5\text{V}, I_E = 0, f = 100\text{kHz}$	-	-	6.5	pF
Emitter-Base Capacitance	C_{eb}	$V_{CB} = 0.5\text{V}, I_C = 0, f = 100\text{kHz}$	-	-	30	pF
Input Impedance	h_{ie}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	1.0	-	15	kΩ
Voltage Feedback Ratio	h_{re}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	0.1	-	8.0	$\times 10^{-6}$
Small-Signal Current Gain	h_{fe}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	40	-	500	
Output Admittance	h_{oe}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	1.0	-	30	μmhos
Switching Characteristics						
Delay Time	t_d	$V_{CC} = 30\text{V}, V_{EB(\text{off})} = 2\text{V}, I_C = 150\text{mA}, I_{B1} = 15\text{mA}$	-	-	15	ns
Rise Time	t_r		-	-	20	ns
Storage Time	t_s	$V_{CC} = 30\text{V}, I_C = 150\text{mA}, I_{B1} = I_{B2} = 15\text{mA}$	-	-	225	ns
Fall Time	t_f		-	-	30	ns

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

