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PN4248 and PN4249 Silicon PNP Transistors Audio Amplifier, Switch TO-92 Type Package

Absolute Maximum Ratings: (Note 1)

Collector-Emitter Voltage (Note 2), V_{CEO}		
PN4248	40V	
PN4249	60V	
Collector-Emitter Voltage, V_{CES}		
PN4248	40V	
PN4249	60V	
Collector-Base Voltage, V_{CBO}		
PN4248	40V	
PN4249	60V	
Emitter-Base Voltage, V_{EBO}		5V
Total Device Dissipation (Note 3), P_D		
$T_A = 25^\circ\text{C}$	625mW	
$T_C = 25^\circ\text{C}$	1W	
Operating Junction Temperature, T_J		+150°C
Storage Temperature Range, T_{stg}		-55° to +150°C

Note 1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.

Note 2. Rating refers to a high current point where Collector-Emitter voltage is lowest.

Note 3. These ratings give a maximum junction temperature of +150°C and Junction-to-Case Thermal Resistance of +125°C/W (derating factor of 5.0mW/°C); Junction-to-Ambient Thermal Resistance of +200°C/W (derating factor of 5.0mW/°C)

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage PN4248	$V_{(BR)CES}$	$I_C = 10\mu\text{A}, I_E = 0$	40	-	-	V
			60	-	-	V
Collector-Base Breakdown Voltage PN4248	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}, I_E = 0$	40	-	-	V
			60	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}, I_C = 0$	5	-	-	V
Emitter Cutoff Current	I_{EBO}	$V_{EB} = -3\text{V}, I_C = 0$	-	-	20	nA
Collector Cutoff Current	I_{CBO}	$V_{CB} = -40\text{V}, I_E = 0$	-	-	10	nA
		$V_{CB} = -40\text{V}, I_E = 0, T_A = +65^\circ\text{C}$	-	-	3	μA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
DC Current Gain PN4248	h_{FE}	$V_{CE} = -5\text{V}, I_C = 100\mu\text{A}$	50	-	-	
PN4249			100	-	300	
PN4248		$V_{CE} = -5\text{V}, I_C = 1\text{mA}$	50	-	-	
PN4249			100	-	-	
DC Pulse Current Gain PN4248	h_{FE}	$V_{CE} = -5\text{V}, I_C = 10\text{mA}$, Note 4	50	-	-	
PN4249			100	-	-	
Collector-Emitter Sustaining Voltage PN4248	$V_{CEO(sus)}$	$I_C = 5\text{mA}$ (pulsed), $I_B = 0$, Note 4	40	-	-	V
PN4249			60	-	-	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$, Note 4	-	-	0.25	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$, Note 4	-	-	0.9	V
Output Capacitance	C_{ob}	$V_{CB} = -5\text{V}, I_E = 0, f = 1\text{MHz}$	-	-	6	pF
Input Capacitance	C_{ib}	$V_{BE} = -0.5\text{V}, I_C = 0, f = 1\text{MHz}$	-	-	16	pF
High Frequency Current Gain	h_{fe}	$I_C = 0.5\text{mA}, V_{CE} = 5\text{V}, f = 20\text{MHz}$	2	-	-	
Small-Signal Current Gain PN4248	h_{fe}	$I_C = 1\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	50	-	1000	
PN4249			100	-	550	
Input Resistance (PN4249 ONLY)	h_{ie}	$I_C = 1\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	2.5	-	17	k Ω
Output Conductance (PN4249 ONLY)	h_{oe}	$I_C = 1\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	5	-	40	μmhos
Voltage Ratio Feedback (PN4249 ONLY)	h_{re}	$I_C = 1\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	-	-	10	$\times 10^{-4}$
Wide Band Noise Figure (PN4249 ONLY)	NF	$I_C = 20\mu\text{A}, V_{CE} = 5\text{V}, R_S = 10\text{k}\Omega,$ $f = 10\text{Hz to } 10\text{kHz}, \text{PBW} = 15.7\text{kHz}$	-	-	3	dB
Narrow Band Noise Figure (PN4249 ONLY)	NF	$I_C = 20\mu\text{A}, V_{CE} = 5\text{V}, R_S = 10\text{k}\Omega,$ $f = 1\text{kHz}, \text{PBW} = 150\text{Hz}$	-	-	3	dB
		$I_C = 250\mu\text{A}, V_{CE} = 5\text{V}, R_S = 10\Omega,$ $f = 1\text{kHz}, \text{PBW} = 150\text{Hz}$	-	-	3	dB

Note 4. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2%.

