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## PN2907A

### Silicon PNP Transistor

### Audio Amplifier, Switch

### TO-92 Type Package

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$ , Note 1 unless otherwise specified)

Collector–Emitter Voltage, $V_{CEO}$ .....	60V
Collector–Base Voltage, $V_{CBO}$ .....	60V
Emitter–Base Voltage, $V_{EBO}$ .....	5V
Continuous Collector Current, $I_C$ .....	800mA
Total Device Dissipation ( $T_A = 25^\circ\text{C}$ , Note 2), $P_D$ .....	625mW
Derate Above $25^\circ\text{C}$ .....	5mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case (Note 2), $R_{thJC}$ .....	83.3 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Ambient (Note 2), $R_{thJA}$ .....	200 $^\circ\text{C}/\text{W}$

Note 1. These are steady–state limits and based on a maximum junction temperature of  $+150^\circ\text{C}$ .  
 Note 2. PCB size: FR-4 76mm x 114mm x 1.57mm (3 inch x 4.5 inch x .062 inch) with minimum land pattern size.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}$ , $I_B = 0$ , Note 3	60	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$ , $I_E = 0$	60	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$ , $I_C = 0$	5	–	–	V
Base Cutoff Current	$I_{BL}$	$V_{CE} = 30\text{V}$ , $V_{EB} = 0.5\text{V}$	–	–	50	nA
Collector Cutoff Current	$I_{CEX}$	$V_{CE} = 30\text{V}$ , $V_{EB} = 0.5\text{V}$	–	–	50	nA
		$V_{CB} = 50\text{V}$ , $I_E = 0$	–	–	0.02	$\mu\text{A}$
		$V_{CB} = 50\text{V}$ , $I_E = 0$ , $T_A = +150^\circ\text{C}$	–	–	20	$\mu\text{A}$
<b>ON Characteristics (Note 2)</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 10\text{V}$ , $I_C = 0.1\text{A}$	75	–	–	
		$V_{CE} = 10\text{V}$ , $I_C = 1\text{mA}$	100	–	–	
		$V_{CE} = 10\text{V}$ , $I_C = 10\text{mA}$	100	–	–	
		$V_{CE} = 10\text{V}$ , $I_C = 150\text{mA}$ , Note 3	100	–	300	
		$V_{CE} = 10\text{V}$ , $I_C = 500\text{mA}$ , Note 3	50	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}$ , $I_B = 15\text{mA}$ , Note 3	–	–	0.4	V
		$I_C = 500\text{mA}$ , $I_B = 50\text{mA}$ , Note 3	–	–	1.5	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{mA}$ , $I_B = 15\text{mA}$ , Note 4	–	–	1.3	V
		$I_C = 500\text{mA}$ , $I_B = 50\text{mA}$	–	–	2.6	V

Note 3. 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
<b>Small Signal Characteristics</b>						
Current Gain – Bandwidth Product	$f_T$	$I_C = 50\text{mA}, V_{CE} = 20\text{V}, f = 100\text{MHz}$	200	–	–	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{kHz}$	–	–	8	pF
Input Capacitance	$C_{ib}$	$V_{BE} = 2\text{V}, I_C = 0, f = 1\text{MHz}$	–	–	30	pF
<b>Switching Characteristics</b>						
Turn-On Time	$t_{on}$	$V_{CC} = 30\text{V}, I_C = 150\text{mA}, I_{B1} = 15\text{mA}$	–	–	45	ns
Delay Time	$t_d$		–	–	10	ns
Rise Time	$t_r$		–	–	40	ns
Turn-Off Time	$t_{off}$	$V_{CC} = 6\text{V}, I_C = 150\text{mA}, I_{B1} = I_{B2} = 15\text{mA}$	–	–	100	ns
Storage Time	$t_s$		–	–	80	ns
Fall Time	$t_f$		–	–	30	ns

