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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   |

