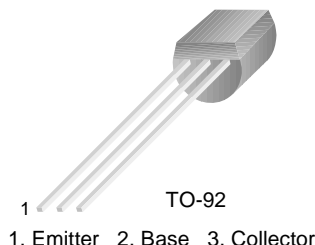


PN930

NPN General Purpose Amplifier

- This device is designed for low noise, high gain, general purpose applications at collector currents from 1μA to 50mA.



Absolute Maximum Ratings* $T_A=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Value | Units |
|----------------|--|------------|------------------|
| V_{CEO} | Collector-Emitter Voltage | 45 | V |
| V_{CBO} | Collector-Base Voltage | 45 | V |
| V_{EBO} | Emitter-Base Voltage | 5.0 | V |
| I_C | Collector Current - Continuous | 100 | mA |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | - 55 ~ 150 | $^\circ\text{C}$ |

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

NOTES:

- These ratings are based on a maximum junction temperature of 150 degrees C.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations

Electrical Characteristics $T_A=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|-------------------------------------|---------------------------------------|--|-----------------|------------|---------------------|
| Off Characteristics | | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage * | $I_C = 10\text{mA}, I_B = 0$ | 45 | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C = 10\mu\text{A}, I_E = 0$ | 45 | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E = 10\text{nA}, I_C = 0$ | 5.0 | | V |
| I_{CEO} | Collector Cutoff Current | $V_{CE} = 5.0\text{V}$ | | 2.0 | nA |
| I_{CBO} | Collector Cutoff Current | $V_{CB} = 45\text{V}, I_E = 0$ | | 10 | nA |
| I_{CES} | Collector Cutoff Current | $V_{CB} = 45\text{V}, I_E = 0$ $V_{CB} = 45\text{V}, I_E = 0, T_A = 170^\circ\text{C}$ | | 10 | nA μA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB} = 5.0\text{V}, I_C = 0$ | | 10 | nA |
| On Characteristics | | | | | |
| h_{FE} | DC Current Gain | $V_{CE} = 5.0\text{V}, I_C = 10\mu\text{A}$ $V_{CE} = 5.0\text{V}, I_C = 10\mu\text{A}, T_A = -55^\circ\text{C}$ $V_{CE} = 5.0\text{V}, I_C = 500\mu\text{A}$ $V_{CE} = 5.0\text{V}, I_C = 10\text{mA}$ | 10 20 150 | 300 600 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 10\text{mA}, I_B = 0.5\text{mA}$ | | 1.0 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 10\text{mA}, I_B = 0.5\text{mA}$ | 0.6 | 1.0 | V |
| Small Signal Characteristics | | | | | |
| C_{ob} | Output Capacitance | $V_{CB} = 5.0\text{V}, f = 1.0\text{MHz}$ | | 8.0 | pF |
| h_{fe} | Small Signal Current Gain | $I_C = 500\mu\text{A}, V_{CE} = 5.0\text{V}, f = 20\text{MHz}$ $I_C = 1.0\text{mA}, V_{CE} = 5.0\text{V}, f = 1.0\text{KHz}$ | 1.5 150 | 600 | |
| h_{ib} | Input Impedance | $I_C = 1.0\text{mA}, V_{CE} = 5.0\text{V}, f = 1.0\text{KHz}$ | 25 | 32 | Ω |
| h_{rb} | Voltage Feedback Ratio | | | 600 | $\times 10^{-6}$ |
| h_{ob} | Output Admittance | | | 1.0 | μmho |
| NF | Noise Figure | $V_{CE} = 5.0\text{V}, I_C = 10\mu\text{A}$ $R_G = 10\text{K}\Omega, B_W = 15.7\text{KHz}$ | | 3.0 | dB |

* Pulse Test: Pulse Width $\leq 300\text{ms}$, Duty Cycle $\leq 2.0\%$

Thermal Characteristics $T_A=25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Max. | Units |
|-----------------------|---|------|----------------------------|
| P_D | Total Device Dissipation | 625 | mW |
| | Derate above 25°C | 5.0 | $\text{mW}/^\circ\text{C}$ |
| $R_{\theta\text{JC}}$ | Thermal Resistance, Junction to Case | 83.3 | $^\circ\text{C}/\text{W}$ |
| $R_{\theta\text{JA}}$ | Thermal Resistance, Junction to Ambient | 200 | $^\circ\text{C}/\text{W}$ |

Package Dimensions

PN9330

TO-92



Dimensions in Millimeters

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PRODUCT STATUS DEFINITIONS

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| Datasheet Identification | Product Status | Definition |
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