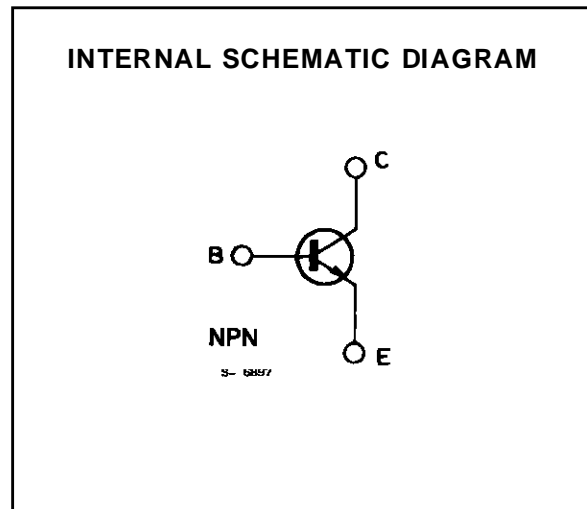
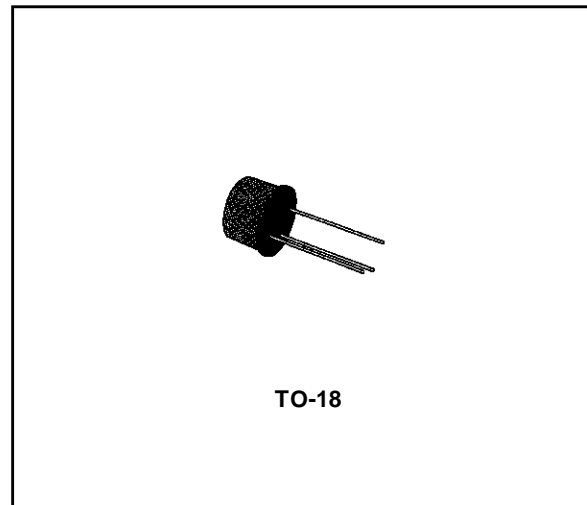


LOW-LEVEL, LOW-NOISE AMPLIFIERS

DESCRIPTION

The 2N930 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case, designed for use in high performance, low-level, low-noise amplifier applications.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|----------------|---|-------------|------------------|
| V_{CBO} | Collector-base Voltage ($I_E = 0$) | 45 | V |
| V_{CEO} | Collector-emitter Voltage ($I_B = 0$) | 45 | V |
| V_{EBO} | Emitter-base Voltage ($I_C = 0$) | 5 | V |
| I_C | Collector Current | 30 | mA |
| P_{tot} | Total Power Dissipation at $T_{amb} = 25\text{ }^\circ\text{C}$ at $T_{case} = 25\text{ }^\circ\text{C}$ | 0.3 | W |
| | | 0.6 | W |
| T_{stg}, T_j | Storage and Junction Temperature | - 55 to 200 | $^\circ\text{C}$ |

2N930

THERMAL DATA

| | | | | |
|------------------|-------------------------------------|-----|-----|------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case | Max | 292 | °C/W |
| $R_{th\ j-amb}$ | Thermal Resistance Junction-ambient | Max | 583 | °C/W |

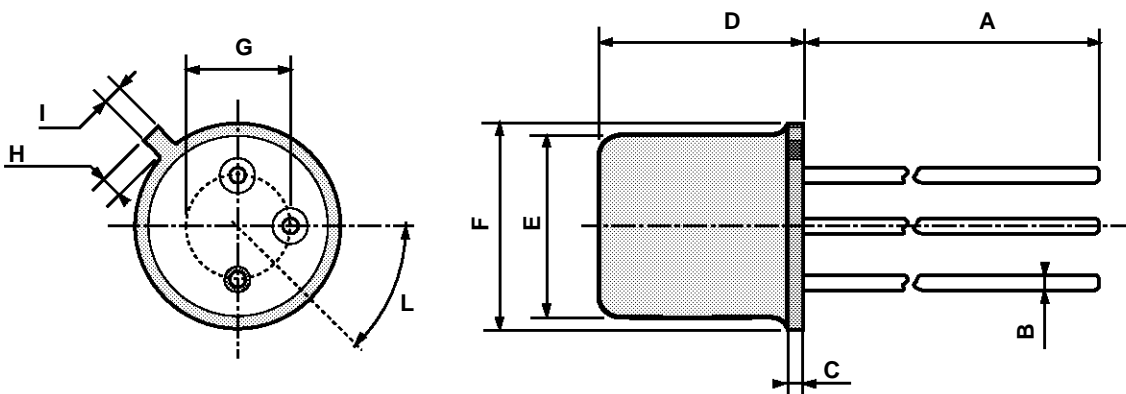
ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---|--|-------------------------|------|----------|---------------------|
| I_{CBO} | Collector Cutoff Current ($I_E = 0$) | $V_{CB} = 45\text{ V}$ | | | 10 | nA |
| I_{CES} | Collector Cutoff Current ($V_{BE} = 0$) | $V_{CE} = 45\text{ V}$ $V_{CE} = 45\text{ V}$ $T_{amb} = 150\text{ °C}$ | | | 10 10 | nA μA |
| I_{CEO} | Collector Cutoff Current ($I_B = 0$) | $V_{CE} = 5\text{ V}$ | | | 2 | nA |
| I_{EBO} | Emitter Cutoff Current ($I_C = 0$) | $V_{EB} = 5\text{ V}$ | | | 10 | nA |
| $V_{(BR)CEO}^*$ | Collector-emitter Breakdown Voltage ($I_B = 0$) | $I_C = 10\text{ mA}$ | 45 | | | V |
| $V_{(BR)EBO}$ | Emitter-base Breakdown Voltage ($I_C = 0$) | $I_E = 10\text{ nA}$ | 5 | | | V |
| $V_{CE(sat)}^*$ | Collector-emitter Sustaining Voltage | $I_C = 10\text{ mA}$ $I_B = 0.5\text{ mA}$ | | | 1 | V |
| V_{BE}^* | Base-emitter Voltage | $I_C = 10\text{ mA}$ $I_B = 0.5\text{ mA}$ | 0.6 | | 1 | V |
| h_{FE}^* | DC Current Gain | $I_C = 10\text{ }\mu\text{A}$ $V_{CE} = 5\text{ V}$ $I_C = 0.5\text{ mA}$ $V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}$ $V_{CE} = 5\text{ V}$ $I_C = 10\text{ }\mu\text{A}$ $V_{CE} = 5\text{ V}$ $T_{amb} = -55\text{ °C}$ | 100 150 600 20 | | 300 | – – – – |
| h_{fe} | Small Signal Current Gain | $I_C = 1\text{ mA}$ $V_{CE} = 5\text{ V}$ $f = 1\text{ kHz}$ | 150 | | 600 | – |
| f_T | Transition Frequency | $I_C = 0.5\text{ mA}$ $V_{CE} = 5\text{ V}$ $f = 30\text{ MHz}$ | 30 | | | MHz |
| C_{CBO} | Collector-base Capacitance | $I_E = 0$ $V_{CB} = 5\text{ V}$ $f = 1\text{ MHz}$ | | | 8 | pF |
| NF | Noise Figure | $I_C = 10\text{ }\mu\text{A}$ $V_{CE} = 5\text{ V}$ $f = 1\text{ kHz}$ $R_g = 10\text{ k}\Omega$ | | | 3 | dB |

* Pulsed : pulse duration = 300 μs , duty cycle = 1%

TO-18 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|------|------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | 12.7 | | | 0.500 | |
| B | | | 0.49 | | | 0.019 |
| D | | | 5.3 | | | 0.208 |
| E | | | 4.9 | | | 0.193 |
| F | | | 5.8 | | | 0.228 |
| G | 2.54 | | | 0.100 | | |
| H | | | 1.2 | | | 0.047 |
| I | | | 1.16 | | | 0.045 |
| L | 45° | | | 45° | | |



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