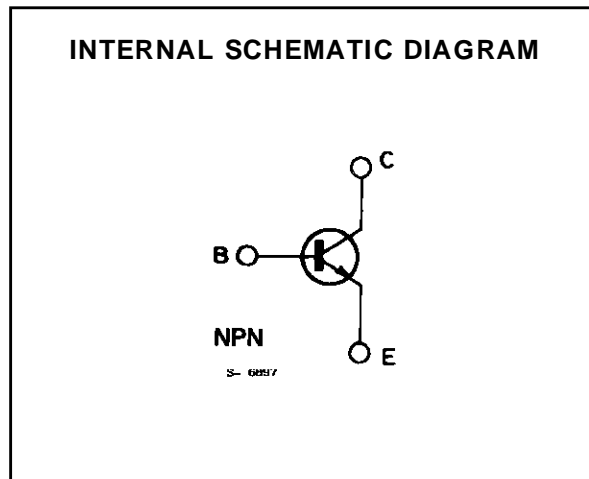
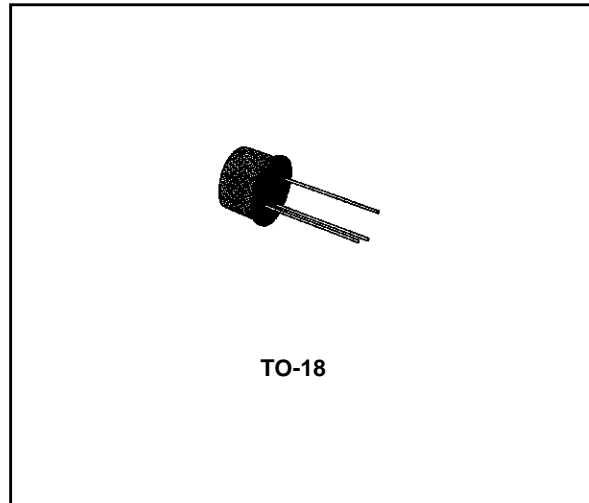


**GENERAL PURPOSE AMPLIFIERS**

**DESCRIPTION**

The 2N3700 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case, intended for small signal, low noise industrial applications.



**ABSOLUTE MAXIMUM RATINGS**

| Symbol         | Parameter  | Value       | Unit             |
|----------------|--|-------------|------------------|
| $V_{CBO}$      | Collector-base Voltage ( $I_E = 0$ )                               | 140         | V                |
| $V_{CEO}$      | Collector-emitter Voltage ( $I_B = 0$ )                            | 80          | V                |
| $V_{EBO}$      | Emitter-base Voltage ( $I_C = 0$ )                                 | 7           | V                |
| $I_C$          | Collector Current  | 1           | A                |
| $P_{tot}$      | Total Power Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ | 0.5         | W                |
|                | at $T_{case} \leq 25\text{ }^\circ\text{C}$                        | 1.8         | W                |
|                | at $T_{case} \leq 100\text{ }^\circ\text{C}$                       | 1           | W                |
| $T_{stg}, T_j$ | Storage and Junction Temperature                                   | - 65 to 200 | $^\circ\text{C}$ |

## 2N3700

### THERMAL DATA

|                  |                                     |     |     |               |
|------------------|-------------------------------------|-----|-----|---------------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case    | Max | 97  | $^{\circ}C/W$ |
| $R_{th\ j-amb}$  | Thermal Resistance Junction-ambient | Max | 350 | $^{\circ}C/W$ |

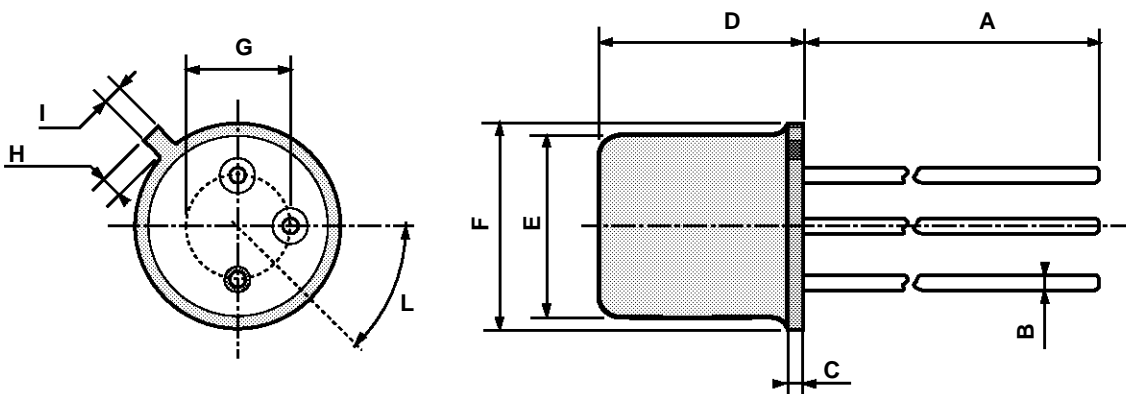
### ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\ ^{\circ}C$ unless otherwise specified)

| Symbol                 | Parameter   | Test Conditions  | Min.                              | Typ. | Max.       | Unit          |
|------------------------|---|--|-----------------------------------|------|------------|---------------|
| $I_{CBO}$              | Collector Cutoff Current ( $I_E = 0$ )            | $V_{CB} = 90\ V$<br>$V_{CB} = 90\ V$ $T_{amb} = 150\ ^{\circ}C$  |                                   |      | 10<br>10   | nA<br>$\mu A$ |
| $I_{EBO}$              | Emitter Cutoff Current ( $I_C = 0$ )              | $V_{EB} = 5\ V$  |                                   |      | 10         | nA            |
| $V_{(BR)CBO}$          | Collector-base Breakdown Voltage ( $I_E = 0$ )    | $I_C = 100\ \mu A$   | 140                               |      |            | V             |
| $V_{(BR)CEO}^*$        | Collector-emitter Breakdown Voltage ( $I_B = 0$ ) | $I_C = 30\ mA$   | 80                                |      |            | V             |
| $V_{(BR)EBO}$          | Emitter-base Breakdown Voltage ( $I_C = 0$ )      | $I_E = 100\ \mu A$   | 7                                 |      |            | V             |
| $V_{CE(sat)}^*$        | Collector-emitter Saturation Voltage              | $I_C = 150\ mA$ $I_B = 15\ mA$<br>$I_C = 500\ mA$ $I_B = 50\ mA$   |                                   |      | 0.2<br>0.5 | V<br>V        |
| $V_{BE(sat)}^*$        | Base-emitter Saturation Voltage                   | $I_C = 150\ mA$ $I_B = 15\ mA$   |                                   |      | 1.1        | V             |
| $h_{FE}^*$             | DC Current Gain                                   | $I_C = 0.1\ mA$ $V_{CE} = 10\ V$<br>$I_C = 10\ mA$ $V_{CE} = 10\ V$<br>$I_C = 150\ mA$ $V_{CE} = 10\ V$<br>$I_C = 500\ mA$ $V_{CE} = 10\ V$<br>$I_C = 1\ A$ $V_{CE} = 10\ V$<br>$I_C = 150\ mA$ $V_{CE} = 10\ V$<br>$T_{amb} = -55\ ^{\circ}C$ | 50<br>90<br>100<br>50<br>15<br>40 |      | 300        |               |
| $h_{fe}$               | Small Signal Current Gain                         | $I_C = 1\ mA$ $V_{CE} = 5\ V$<br>$f = 1\ kHz$  | 80                                |      | 400        |               |
| $f_T$                  | Transition Frequency                              | $I_C = 50\ mA$ $V_{CE} = 10\ V$<br>$f = 20\ MHz$   |                                   | 100  |            | MHz           |
| $C_{EBO}$              | Emitter-base Capacitance                          | $I_C = 0$ $V_{EB} = 0.5\ V$<br>$f = 1\ MHz$  |                                   | 60   |            | pF            |
| $C_{CBO}$              | Collector-base Capacitance                        | $I_E = 0$ $V_{CB} = 10\ V$<br>$f = 1\ MHz$   |                                   | 12   |            | pF            |
| $r_{bb} \cdot C_{b'c}$ | Feedback Time Constant                            | $I_C = 10\ mA$ $V_{CB} = 10\ V$<br>$f = 4\ MHz$  | 25                                |      | 400        | ps            |

\* Pulsed : pulse duration = 300  $\mu s$ , 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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