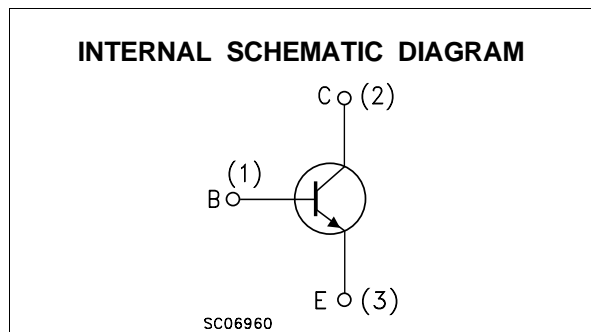
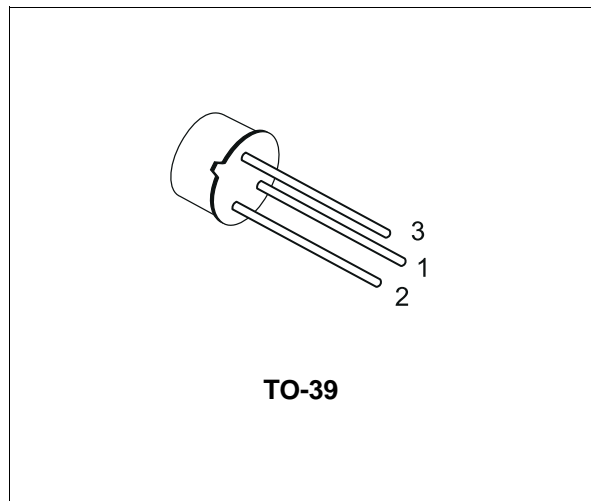


## EPITAXIAL PLANAR NPN

- GENERAL PURPOSE AMPLIFIER AND SWITCH

### DESCRIPTION

The 2N2102 is a silicon Planar Epitaxial NPN transistor in Jedec TO-39 metal case. It is intended for a wide variety of small-signal and medium power applications in military and industrial equipments.



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter  | Value      | Unit             |
|-----------|--|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )   | 120        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )  | 65         | V                |
| $V_{CER}$ | Collector-Emitter Voltage ( $R_{BE} \leq 10\Omega$ )                                   | 80         | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )   | 7          | V                |
| $I_C$     | Collector Current  | 1          | A                |
| $P_{tot}$ | Total Dissipation at $T_{amb} \leq 25^\circ\text{C}$<br>at $T_C \leq 25^\circ\text{C}$ | 1          | W                |
|           |  | 5          | W                |
| $T_{stg}$ | Storage Temperature  | -65 to 175 | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature  | 175        | $^\circ\text{C}$ |

## THERMAL DATA

|                |                                     |     |     |               |
|----------------|-------------------------------------|-----|-----|---------------|
| $R_{thj-case}$ | Thermal Resistance Junction-Case    | Max | 30  | $^{\circ}C/W$ |
| $R_{thj-amb}$  | Thermal Resistance Junction-Ambient | Max | 150 | $^{\circ}C/W$ |

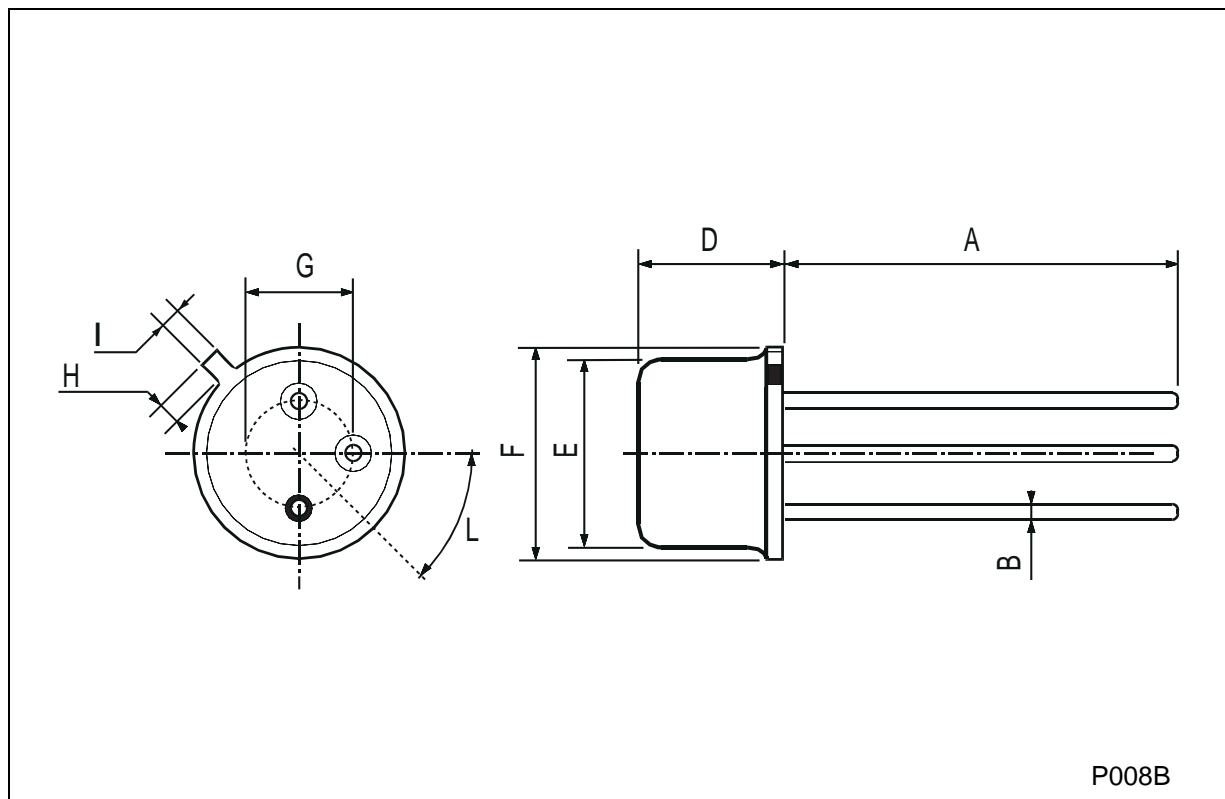
ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

| Symbol          | Parameter  | Test Conditions   | Min.                             | Typ. | Max.   | Unit          |
|-----------------|--|---|----------------------------------|------|--------|---------------|
| $I_{CBO}$       | Collector Cut-off Current ( $I_E = 0$ )            | $V_{CB} = 60 V$<br>$V_{CB} = 60 V \quad T_C = 150^{\circ}C$   |                                  |      | 2<br>2 | nA<br>$\mu A$ |
| $I_{EBO}$       | Emitter Cut-off Current ( $I_C = 0$ )              | $V_{EB} = 5 V$  |                                  |      | 5      | nA            |
| $V_{(BR)CBO}$   | Collector-Base Breakdown Voltage ( $I_E = 0$ )     | $I_C = 100 \mu A$   | 120                              |      |        | V             |
| $V_{CEO(sus)*}$ | Collector-Emitter Sustaining Voltage ( $I_B = 0$ ) | $I_C = 30 mA$   | 65                               |      |        | V             |
| $V_{CE(sat)*}$  | Collector-Emitter Saturation Voltage               | $I_C = 150 mA \quad I_B = 15 mA$  |                                  |      | 0.5    | V             |
| $V_{BE(sat)*}$  | Base-Emitter Saturation Voltage                    | $I_C = 150 mA \quad I_B = 15 mA$  |                                  |      | 1.1    | V             |
| $h_{FE*}$       | DC Current Gain                                    | $I_C = 10 \mu A \quad V_{CE} = 10 V$<br>$I_C = 100 \mu A \quad V_{CE} = 10 V$<br>$I_C = 10 mA \quad V_{CE} = 10 V$<br>$I_C = 150 mA \quad V_{CE} = 10 V$<br>$I_C = 500 mA \quad V_{CE} = 10 V$<br>$I_C = 1 A \quad V_{CE} = 10 V$ | 10<br>20<br>35<br>40<br>25<br>10 |      | 120    |               |
| $h_{fe*}$       | High Frequency Current Gain                        | $I_C = 50 mA \quad V_{CE} = 10 V$<br>$f = 20 MHz$   |                                  | 6    |        |               |
| NF              | Noise Figure                                       | $I_C = 300 \mu A \quad V_{CE} = 10 V \quad f = 1 KHz$<br>$BW = 1 Hz \quad R_g = 510 \Omega$   |                                  |      | 8      | dB            |
| $C_{CBO}$       | Collector-Base Capacitance                         | $I_E = 0 \quad V_{CB} = 10 V \quad f = 1MHz$  |                                  |      | 15     | pF            |
| $C_{EBO}$       | Emitter-Base Capacitance                           | $I_C = 0 \quad V_{EB} = 0.5 V \quad f = 1MHz$   |                                  |      | 80     | pF            |

\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle  $\leq 1\%$

## TO-39 MECHANICAL DATA

| DIM. | mm         |      |      | inch  |      |       |
|------|------------|------|------|-------|------|-------|
|      | MIN.       | TYP. | MAX. | MIN.  | TYP. | MAX.  |
| A    | 12.7       |      |      | 0.500 |      |       |
| B    |            |      | 0.49 |       |      | 0.019 |
| D    |            |      | 6.6  |       |      | 0.260 |
| E    |            |      | 8.5  |       |      | 0.334 |
| F    |            |      | 9.4  |       |      | 0.370 |
| G    | 5.08       |      |      | 0.200 |      |       |
| H    |            |      | 1.2  |       |      | 0.047 |
| I    |            |      | 0.9  |       |      | 0.035 |
| L    | 45° (typ.) |      |      |       |      |       |



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