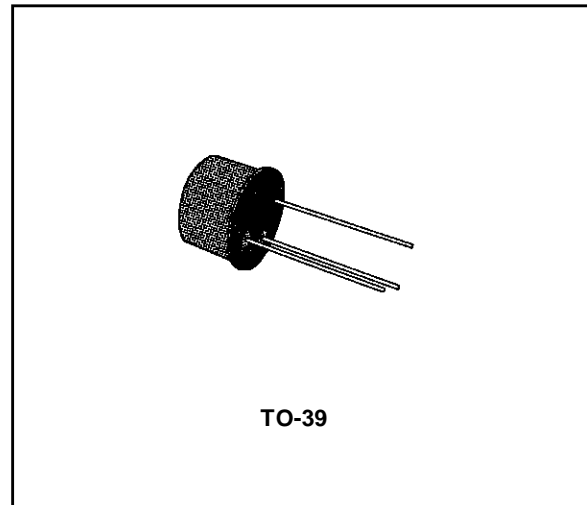


**MEDIUM POWER AUDIO DRIVERS**

**DESCRIPTION**

The BC300, BC301 and BC302 are silicon planar epitaxial NPN transistors in TO-39 metal case. They are intended for audio driver stages in commercial and industrial equipments. In addition they are useful as high speed saturated switches and general purpose amplifiers. The PNP types complementary to BC301 and BC302 are respectively the BC303 and BC304.



**INTERNAL SCHEMATIC DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS**

| Symbol    | Parameter   | Value       |       |       | Unit             |
|-----------|---|-------------|-------|-------|------------------|
|           |   | BC300       | BC301 | BC302 |                  |
| $V_{CBO}$ | Collector-base Voltage ( $I_E = 0$ )  | 120         | 90    | 60    | V                |
| $V_{CEO}$ | Collector-emitter Voltage ( $I_B = 0$ )   | 80          | 60    | 45    | V                |
| $V_{EBO}$ | Emitter-base Voltage ( $I_C = 0$ )  | 7           |       |       | V                |
| $I_C$     | Collector Current   | 0.5         |       |       | A                |
| $I_{CM}$  | Collector Peak Current  | 1           |       |       | A                |
| $P_{tot}$ | Total Power Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$<br>at $T_{case} \leq 25\text{ }^\circ\text{C}$ | 0.85        |       |       | W                |
|           |   | 6           |       |       | W                |
| $T_{stg}$ | Storage Temperature   | - 65 to 175 |       |       | $^\circ\text{C}$ |
| $T_j$     | Junction Temperature  | 175         |       |       | $^\circ\text{C}$ |

## BC300-BC301-BC302

### THERMAL DATA

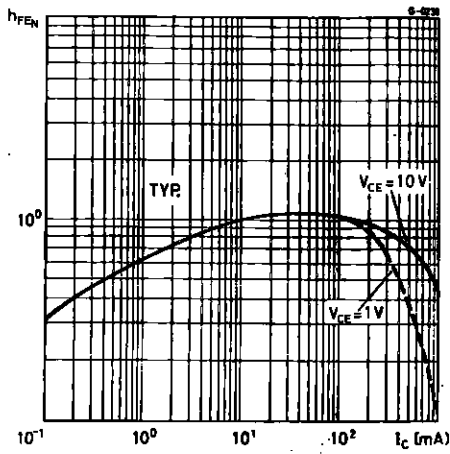
|                  |                                     |     |     |      |
|------------------|-------------------------------------|-----|-----|------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case    | Max | 25  | °C/W |
| $R_{th\ j-amb}$  | Thermal Resistance Junction-ambient | Max | 175 | °C/W |

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

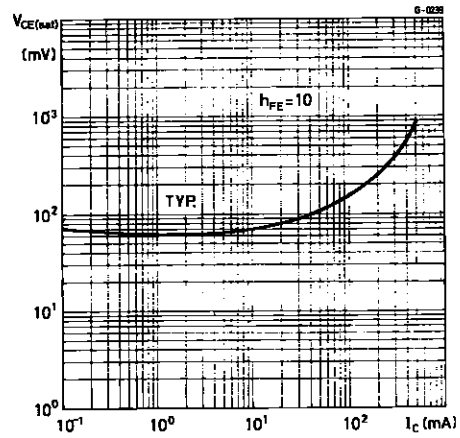
| Symbol          | Parameter   | Test Conditions  | Min.                        | Typ.                 | Max.             | Unit          |
|-----------------|---|--|-----------------------------|----------------------|------------------|---------------|
| $I_{CBO}$       | Collector Cutoff Current ( $I_E = 0$ )            | $V_{CB} = 60\text{ V}$   |                             | 5                    | 20               | nA            |
| $I_{EBO}$       | Emitter Cutoff Current ( $I_C = 0$ )              | $V_{EB} = 5\text{ V}$  |                             |                      | 10               | nA            |
| $V_{(BR)CEO}^*$ | Collector-emitter Breakdown Voltage ( $I_B = 0$ ) | $I_C = 30\text{ mA}$ for <b>BC300</b><br>for <b>BC301</b><br>for <b>BC302</b>  | 80<br>60<br>45              |                      |                  | V<br>V<br>V   |
| $V_{(BR)CBO}$   | Collector-base Breakdown Voltage ( $I_E = 0$ )    | $I_C = 100\text{ }\mu\text{A}$ for <b>BC300</b><br>for <b>BC301</b><br>for <b>BC302</b>  | 120<br>90<br>60             |                      |                  | V<br>V<br>V   |
| $V_{CE(sat)}^*$ | Collector-emitter Saturation Voltage              | $I_C = 150\text{ mA}$ $I_B = 15\text{ mA}$   |                             | 0.2                  | 0.5              | V             |
| $V_{BE}^*$      | Base-emitter Voltage                              | $I_C = 150\text{ mA}$ $V_{CE} = 10\text{ V}$   |                             | 0.78                 |                  | V             |
| $h_{FE}^*$      | DC Current Gain Gr. 4<br>Gr. 5<br>Gr. 6           | $I_C = 150\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$I_C = 150\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$I_C = 150\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$I_C = 0.1\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$I_C = 500\text{ mA}$ $V_{CE} = 10\text{ V}$ | 40<br>70<br>120<br>20<br>20 |                      | 80<br>140<br>240 |               |
| $f_T$           | Transition Frequency                              | $I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$  |                             | 100                  |                  | MHz           |
| $C_{CBO}$       | Collector-base Capacitance                        | $I_E = 0$ $V_{CB} = 10\text{ V}$   |                             | 12                   |                  | pF            |
| $h_{ie}$        | Input Impedance                                   | $I_C = 5\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$f = 1\text{ kHz}$   |                             | 1.1                  |                  | k $\Omega$    |
| $h_{re}$        | Reverse Voltage Ratio                             | $I_C = 5\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$f = 1\text{ kHz}$   |                             | $1.7 \times 10^{-4}$ |                  |               |
| $h_{fe}$        | Small Signal Current Gain                         | $I_C = 5\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$f = 1\text{ kHz}$   |                             | 140                  |                  |               |
| $h_{oe}$        | Output Admittance                                 | $I_C = 5\text{ mA}$ $V_{CE} = 10\text{ V}$<br>$f = 1\text{ kHz}$   |                             | 14                   |                  | $\mu\text{S}$ |

\* Pulsed: pulse duration = 300  $\mu\text{s}$ , duty cycle = 1 %.

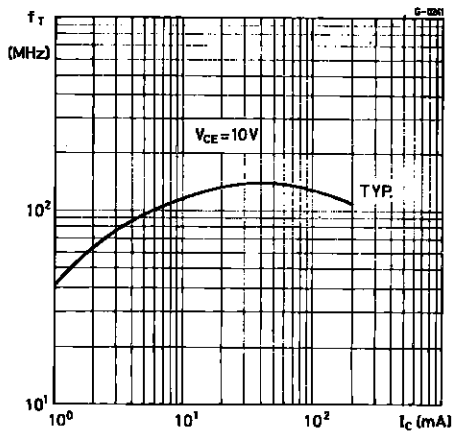
DC Normalized Current Gain.



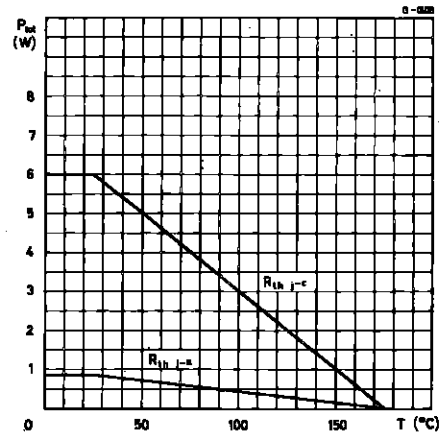
Collector-emitter Saturation Voltage.



Transition Frequency.

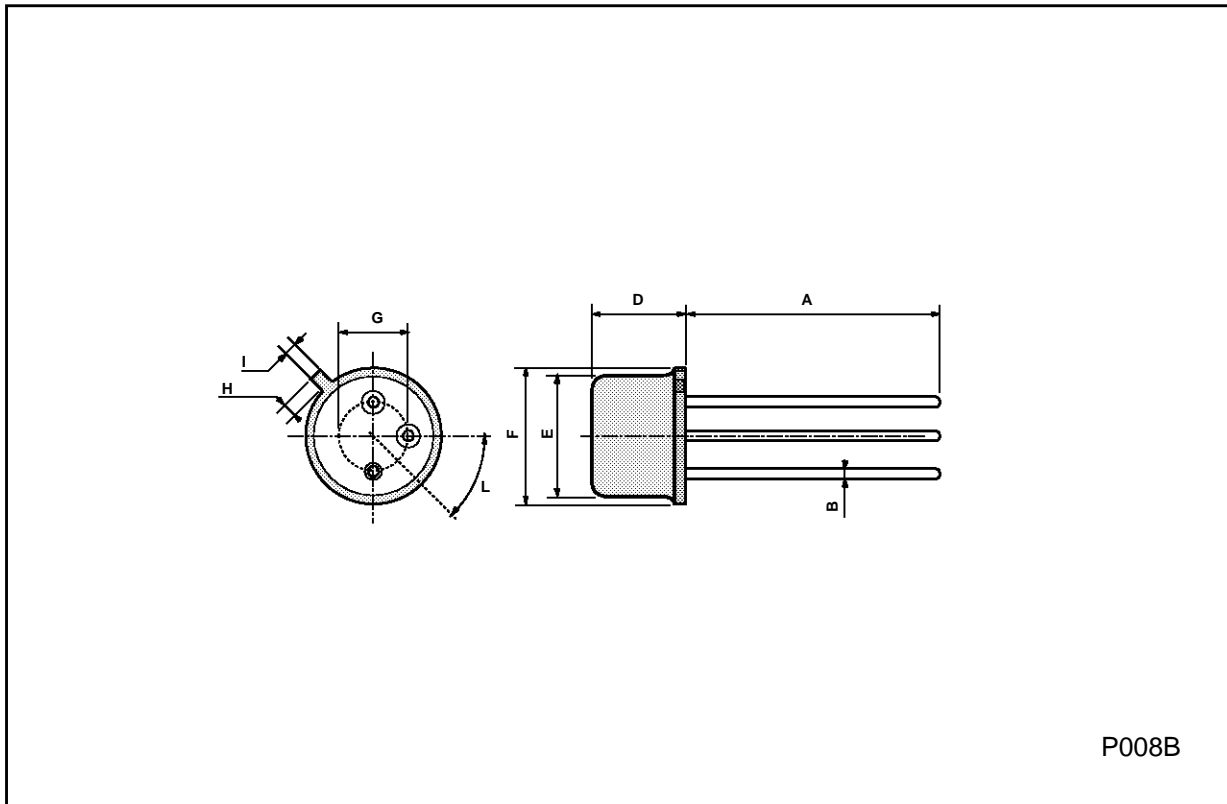


Power Rating Chart.



**TO39 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.) |      |      |       |      |       |



P008B

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