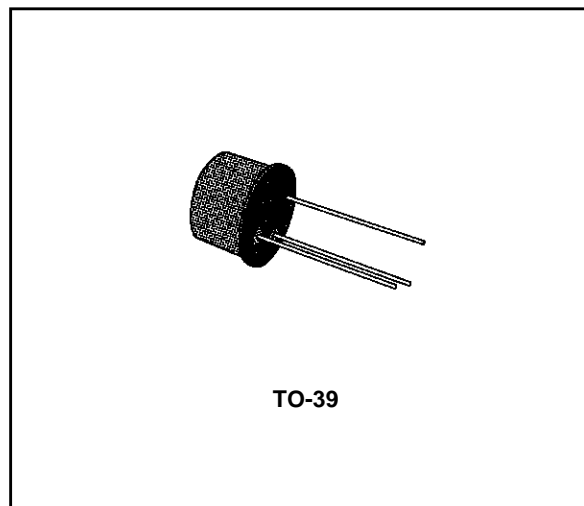


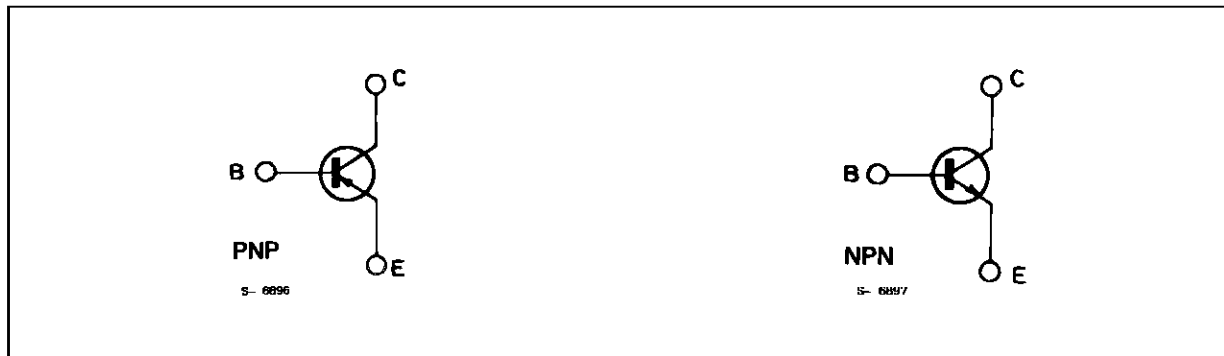
GENERAL PURPOSE TRANSISTORS

DESCRIPTION

The BC160, and BC161 are silicon planar epitaxial PNP transistors in TO-39 metal case. They are particularly designed for audio amplifiers and switching applications up to 1A. The complementary NPN types are the BC140 and BC141.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | Unit |
|-----------|---|-------------|-------|------------------|
| | | BC160 | BC161 | |
| V_{CBO} | Collector-base Voltage ($I_E = 0$) | - 40 | - 60 | V |
| V_{CEO} | Collector-emitter Voltage ($I_B = 0$) | - 40 | - 60 | V |
| V_{EBO} | Emitter-base Voltage ($I_C = 0$) | - 5 | | V |
| I_C | Collector Current | - 1 | | A |
| I_B | Base Current | - 0.1 | | A |
| P_{tot} | Total Power Dissipation at $T_{amb} \leq 45\text{ }^\circ\text{C}$ at $T_{case} \leq 45\text{ }^\circ\text{C}$ | 0.65 | | W |
| | | 3.7 | | W |
| T_{stg} | Storage Temperature | - 55 to 175 | | $^\circ\text{C}$ |
| T_j | Junction Temperature | 175 | | $^\circ\text{C}$ |

BC160-BC161

THERMAL DATA

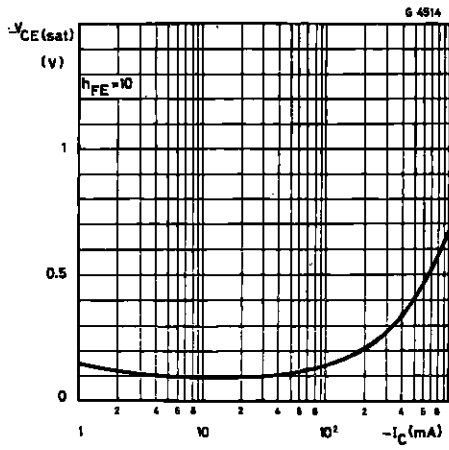
| | | | | |
|------------------|-------------------------------------|-----|-----|------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case | Max | 35 | °C/W |
| $R_{th\ j-amb}$ | Thermal Resistance Junction-ambient | Max | 200 | °C/W |

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

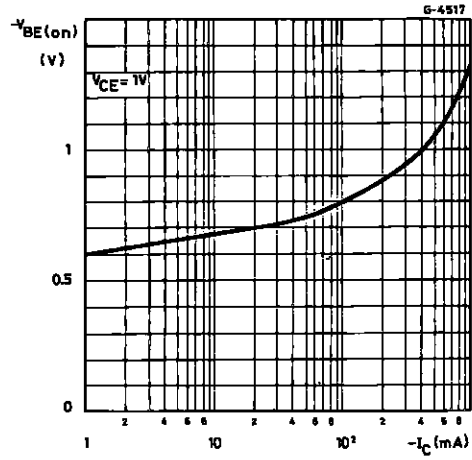
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---|---|--------------|---|----------------------------------|--|
| I_{CES} | Collector Cutoff Current ($I_E = 0$) | $V_{CES} = 40\text{ V}$ for BC160 $V_{CES} = 60\text{ V}$ for BC161 $V_{CES} = 40\text{ V}$ for BC160 $T_{amb} = 150\text{ °C}$ $V_{CES} = 60\text{ V}$ for BC161 $T_{amb} = 150\text{ °C}$ | | | - 100 - 100 - 100 - 100 | nA nA μA μA |
| $V_{(BR)CBO}$ | Collector-base Breakdown Voltage ($I_E = 0$) | $I_C = -100\ \mu\text{A}$ for BC160 for BC161 | - 40 - 60 | | | V V |
| $V_{(BR)CEO}^*$ | Collector-emitter Breakdown Voltage ($I_B = 0$) | $I_C = -10\text{ mA}$ for BC160 for BC161 | - 40 - 60 | | | V V |
| $V_{(BR)EBO}$ | Emitter-base Breakdown Voltage ($I_C = 0$) | $I_E = -100\ \mu\text{A}$ | - 5 | | | V |
| $V_{CE(sat)}^*$ | Collector-emitter Saturation Voltage | $I_C = -0.1\text{ A}$ $I_B = -10\text{ mA}$ $I_C = -0.5\text{ A}$ $I_B = -50\text{ mA}$ $I_C = -1\text{ A}$ $I_B = -0.1\text{ A}$ | | - 0.1 - 0.35 - 0.6 | - 1 | V V V |
| V_{BE}^* | Base-emitter Voltage | $I_C = -1\text{ A}$ $V_{CE} = -1\text{ V}$ | | - 1 | - 1.7 | V |
| h_{FE}^* | DC Current Gain | $I_C = -100\ \mu\text{A}$ $V_{CE} = -1\text{ V}$ for BC160-161 for BC160-161 Gr. 6 for BC160-161 Gr. 10 for BC160-161 Gr. 16 $I_C = -100\text{ mA}$ $V_{CE} = -1\text{ V}$ for BC160-161 for BC160-161 Gr. 6 for BC160-161 Gr. 10 for BC160-161 Gr. 16 | | 110 46 80 120 40 40 63 100 | 250 100 160 250 | |
| h_{FE}^* | DC Current Gain | $I_C = -1\text{ A}$ $V_{CE} = -1\text{ V}$ for BC160-161 for BC160-161 Gr. 6 for BC160-161 Gr. 10 for BC160-161 Gr. 16 | | 26 15 20 30 | | |
| f_T | Transition Frequency | $I_C = -50\text{ mA}$ $V_{CE} = -10\text{ V}$ | 50 | | | MHz |
| C_{CBO} | Collector-base Capacitance | $I_E = 0$ $V_{CB} = -20\text{ V}$ $f = 1\text{ MHz}$ | | 15 | 30 | pF |
| C_{EBO} | Emitter-base Capacitance | $V_{EB} = -0.5\text{ V}$ $f = 1\text{ MHz}$ | | | 180 | pF |
| t_{on} | Turn-on Time | $I_C = -100\text{ mA}$ $I_{B1} = -5\text{ mA}$ | | | 500 | ns |
| t_{off} | Turn-off Time | $I_C = -100\text{ mA}$ $I_{B1} = I_{B2} = -5\text{ mA}$ | | | 650 | ns |

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

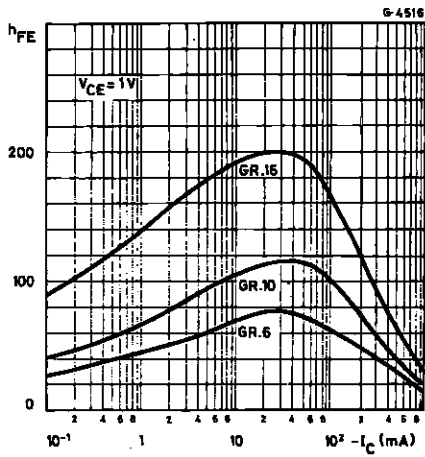
Collector-emitter Saturation Voltage.



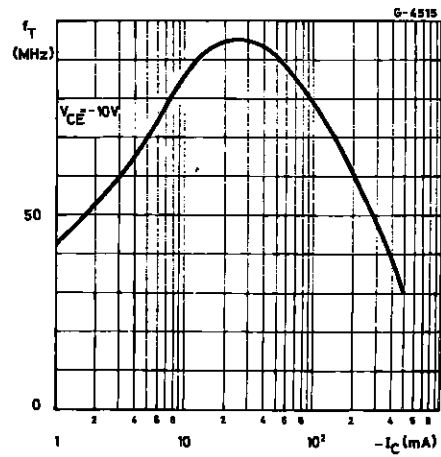
Base-emitter Voltage.



DC Current Gain.

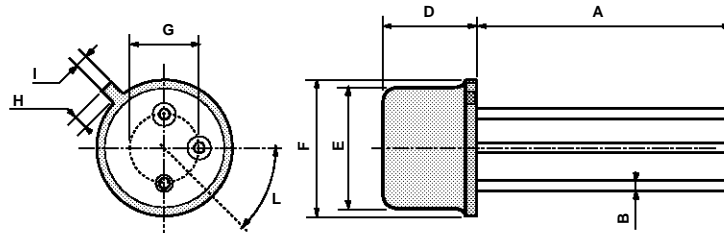


Transition Frequency.



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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