

NPN BC140/10 – BC140/16
NPN BC141/10 – BC141/16

GENERAL PURPOSE TRANSISTORS

They are silicon planar epitaxial NPN transistors mounted in TO-39 metal package. They are particularly designed for audio amplifiers and switching applications up to 1A. PNP complements are the BC160 – BC161. Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

| Symbol | Ratings | | Value | Unit |
|-----------|--|---------------------------|-------------|------------|
| V_{CBO} | Collector-Base Voltage $I_E = 0$ | BC140 | 80 | V |
| | | BC141 | 100 | |
| V_{CEO} | Collector-Emitter Voltage $I_B = 0$ | BC140 | 40 | V |
| | | BC141 | 60 | |
| V_{EBO} | Emitter-Base Voltage $I_C = 0$ | BC140 | 7 | V |
| | | BC141 | | |
| I_C | Collector Current | BC140 | 1 | A |
| | | BC141 | | |
| I_B | Base Current | BC140 | 0.1 | A |
| | | BC141 | | |
| P_{tot} | | @ $T_{case} = < 45^\circ$ | 3.7 | W |
| | | @ $T_{amb} = < 45^\circ$ | 0.65 | |
| T_J | Junction Temperature | | 175 | $^\circ C$ |
| T_{Stg} | Storage Temperature range | | -55 to +175 | $^\circ C$ |

THERMAL CHARACTERISTICS

| Symbol | Ratings | Value | Unit |
|---------------|--------------------------------------|-------|------|
| R_{thJ-c} | Thermal Resistance, Junction-case | 35 | K/ W |
| $R_{thJ-amb}$ | Thermal Resistance, Junction-ambient | 200 | K/ W |

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ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

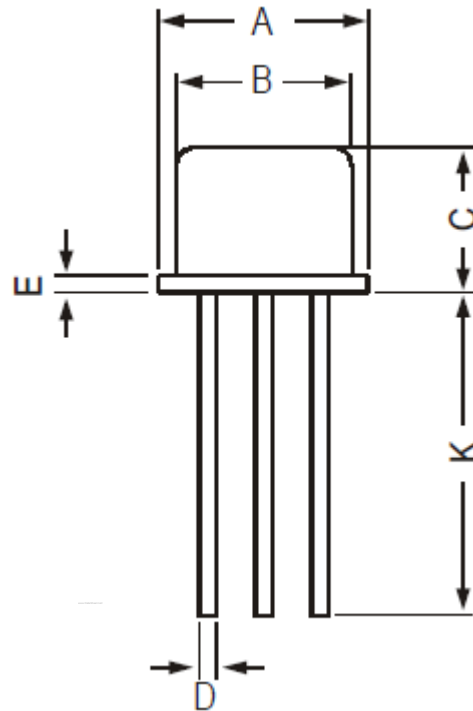
| Symbol | Ratings | Test Condition(s) | Min | Typ | Max | Unit | |
|-------------------|---------------------------------------|---|-------|------|-----|---------------|---|
| I_{CES} | Collector – Cutoff Current | $I_E = 0$ | - | - | 100 | nA | |
| | | $V_{CES} = 60\text{ V}$ | | | | | |
| | | $I_E = 0, V_{CES} = 60\text{ V}$ | - | - | 100 | μA | |
| | | $T_{amb} = 150^\circ\text{C}$ | | | | | |
| V_{CB0} | Collector – Base Breakdown Voltage | $I_C = 100\ \mu\text{A}$ | BC140 | 80 | - | - | V |
| | | $I_E = 0$ | BC141 | 100 | - | - | |
| $V_{CE0} (*)$ | Collector – Emitter Breakdown Voltage | $I_C = 30\text{ mA}$ | BC140 | 40 | - | - | V |
| | | $I_B = 0$ | BC141 | 60 | - | - | |
| V_{EB0} | Emitter – Base Breakdown Voltage | $I_E = 100\ \mu\text{A}$ | BC140 | 7 | - | - | V |
| | | $I_C = 0$ | BC141 | | | | |
| $V_{CE(SAT)} (*)$ | Collector-Emitter saturation Voltage | $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ | - | 0.1 | | V | |
| | | $I_C = 500\text{ mA}, I_B = 50\text{ mA}$ | - | 0.35 | | | |
| | | $I_C = 1\text{ A}, I_B = 100\text{ mA}$ | - | 0.6 | 1 | | |
| $V_{BE} (*)$ | Base-Emitter Voltage | $I_C = 1\text{ A}, V_{CE} = 1\text{ V}$ | | 1.25 | 1.8 | | |
| $h_{FE} (*)$ | DC Current Gain | $I_C = 100\ \mu\text{A}, V_{CE} = 1\text{ V}$ | | - | 75 | - | - |
| | | | Gr 10 | - | 40 | - | |
| | | | Gr 16 | - | 90 | - | |
| | | $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}$ | | 40 | 140 | 250 | |
| | | | Gr 10 | 63 | 100 | 160 | |
| | | | Gr 16 | 100 | 160 | 250 | |
| | | $I_C = 1\text{ A}, V_{CE} = 1\text{ V}$ | | - | 26 | - | |
| | | | Gr 10 | - | 20 | - | |
| | | | Gr 16 | - | 30 | - | |
| f_T | Transition Frequency | $I_C = 50\text{ mA}, V_{CE} = 10\text{ V}$ | 50 | - | - | MHz | |
| C_{CB0} | Collector – base Capacitance | $I_E = 0; V_{CB} = 10\text{ V}$ $f = 1\text{ MHz}$ | - | 12 | 25 | pF | |
| t_{off} | Turn-off times | $I_C = 100\text{ mA}$ $I_{B1} = -I_{B2} = 5\text{ mA}$ | - | - | 850 | ns | |
| t_{on} | Turn-on times | $I_C = 100\text{ mA}$ $I_{B1} = 1\text{ mA}$ | - | - | 250 | ns | |

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

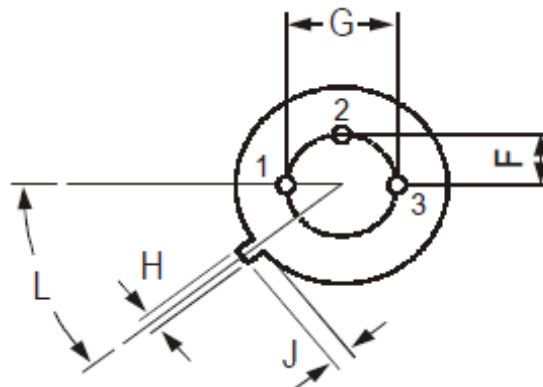
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MECHANICAL DATA CASE TO-39

| DIMENSIONS (mm) | | |
|-----------------|-------|------|
| | min | max |
| A | 8.50 | 9.39 |
| B | 7.74 | 8.50 |
| C | 6.09 | 6.60 |
| D | 0.40 | 0.53 |
| E | - | 0.88 |
| F | 2.41 | 2.66 |
| G | 4.82 | 5.33 |
| H | 0.71 | 0.86 |
| J | 0.73 | 1.02 |
| K | 12.70 | - |
| L | 42° | 48° |



| | |
|---------|-----------|
| Pin 1 : | Emitter |
| Pin 2 : | Base |
| Pin 3 : | Collector |
| Case : | Collector |



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