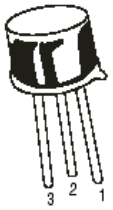
# NPN Medium Power Transistor




**Pin Configuration**
1. Emitter
2. Base
3. Collector

## Features:

- NPN Silicon Power Switching Transistors.
- Medium Power Amplifier and Switching Applications

## Absolute Maximum Ratings:

**($T_a$ = 25°C unless otherwise specified)**

| Characteristic | Symbol | BC140-16 | BC141-16 | Unit |
|---|---|---|---|---|
| Collector Emitter Voltage | $V_{CBO}$ | 40 | 60 | V |
| Collector Base Voltage | $V_{CES}$ | 80 | 100 | |
| Emitter Base Voltage | $V_{EBO}$ | 7 | | |
| Collector Current Continuous | $I_C$ | 1 | | A |
| Power Dissipation at $T_a$ = 25°C<br>Derate above 25°C | $P_D$ | 0.8<br>4.57 | | W<br>mW/°C |
| Power Dissipation at $T_C$ = 25°C<br>Derate above 25°C | | 4<br>22.73 | | |
| Operating Storage Temperature Range | $T_j$, $T_{stg}$ | -65 to +200 | | °C |

**Thermal Resistance**

| | | | |
|---|---|---|---|
| Junction to Ambient in Free Air | $R_{th(j-a)}$ | 219 | °C/W |
| Junction to Case | $R_{th(j-c)}$ | 44 | |

## Electrical Characteristics:

**($T_a$ = +25°C unless otherwise specified)**

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector Emitter Voltage | $V_{CES}$ | $I_C$ = 100µA, $V_{BE}$ = 0<br>BC140-16<br>BC141-16 | <br>80<br>100 | | - | V |
| | *$V_{CEO}$ | $I_C$ = 30mA, $I_B$ = 0<br>BC140-16<br>BC141-16 | <br>40<br>60 | | | |
| Emitter Base Voltage | $V_{EBO}$ | $I_E$ = 100µA, $I_C$ = 0 | 7 | | - | |
| Collector Cut off Current | $I_{CES}$ | $V_{CE}$ = 60V, $V_{BE}$ = 0 | - | - | 100 | nA |
| | | $V_{CE}$ = 60V, $V_{BE}$ = 0, $T_a$ = 150ºC | | | | µA |
| DC Current Gain | *$h_{FE}$ | $I_C$ = 100mA, $V_{CE}$ = 1V<br>BC140-16/BC141-16<br>Group-6<br>Group-10<br>Group-16 | <br>40<br>40<br>63<br>100 | | <br>400<br>100<br>160<br>250 | - |
| | | $I_C$ = 1A, $V_{CE}$ = 1V<br>BC140-16/BC141-16<br>Group-6<br>Group-10<br>Group-16 | - | <br>26<br>15<br>20<br>30 | - | |
| Collector Emitter Saturation Voltage | *$V_{CE(sat)}$ | $I_C$ = 1A, $I_B$ = 0.1A | | - | 1 | V |
| Base Emitter on Voltage | *$V_{BE(on)}$ | $I_C$ = 1A, $V_{CE}$ = 1V | | | 2 | |

**Dynamic Characteristics**

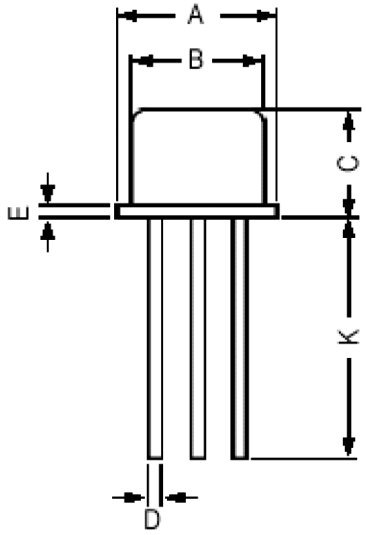
| | | | | | | |
|---|---|---|---|---|---|---|
| Transition Frequency | $f_T$ | $I_C$ = 50mA, $V_{CE}$ = 10V, f = 20MHz | 50 | - | - | MHz |
| Output Capacitance | $C_{ob}$ | $V_{CB}$ = 10V, $I_E$ = 0, f = 1MHz | - | | 25 | pF |
| Input Capacitance | $C_{ib}$ | $V_{EB}$ = 0.5V, $I_C$ = 0, f = 1MHz | | | 80 | |

**Switching Characteristics**

| | | | | | | |
|---|---|---|---|---|---|---|
| Turn On Time | $t_{on}$ | $I_C$ = 150mA, $I_{B1}$ = 7.5mA | - | - | 250 | ns |
| Turn Off Time | $t_{off}$ | $I_C$ = 150mA, $I_{B1}$ = $I_{B2}$ = 7.5mA | | | 850 | |

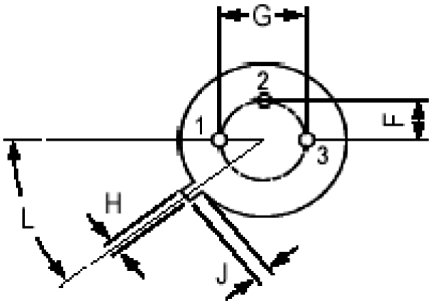
*Pulsed : Pulse Duration ≤300µs, Duty Cycle ≤1%

## TO-39 Metal Can Package




| Dim. | Min. | Max. |
|---|---|---|
| A | 8.5 | 9.39 |
| B | 7.74 | 8.5 |
| C | 6.09 | 6.6 |
| D | 0.4 | 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 | 12.7 | - |
| L | 42° | 48° |

Dimensions : Millimetres




**Pin Configuration**

1. Emitter
2. Base
3. Collector

## Part Number Table

| Description | Part Number |
|---|---|
| Transistor, NPN, TO-39 | BC140-16 |
| | BC141-16 |