



## Pin Configuration

1. Emitter
2. Base
3. Collector

## Features:

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

## Absolute Maximum Ratings:

( $T_a = 25^\circ\text{C}$  unless otherwise specified)

| Characteristic                                                  | Symbol                            | BC140-16    | BC141-16 | Unit       |
|-----------------------------------------------------------------|-----------------------------------|-------------|----------|------------|
| Collector Emitter Voltage                                       | V <sub>CBO</sub>                  | 40          | 60       | V          |
| Collector Base Voltage                                          | V <sub>CES</sub>                  | 80          | 100      |            |
| Emitter Base Voltage                                            | V <sub>EBO</sub>                  | 7           |          |            |
| Collector Current Continuous                                    | I <sub>C</sub>                    | 1           |          | A          |
| Power Dissipation at T <sub>a</sub> = 25°C<br>Derate above 25°C | P <sub>D</sub>                    | 0.8<br>4.57 |          | W<br>mW/°C |
| Power Dissipation at T <sub>C</sub> = 25°C<br>Derate above 25°C |                                   | 4<br>22.73  |          |            |
| Operating Storage Temperature Range                             | T <sub>j</sub> , T <sub>sta</sub> | -65 to +200 |          | °C         |

## Thermal Resistance

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

## Electrical Characteristics:

(T<sub>a</sub> = +25°C unless otherwise specified)

| Parameter                            | Symbol                | Test Condition                                                                                       | Min.                  | Typ.                 | Max.                     | Unit |   |
|--------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------|-----------------------|----------------------|--------------------------|------|---|
| Collector Emitter Voltage            | V <sub>CES</sub>      | I <sub>C</sub> = 100μA, V <sub>BE</sub> = 0<br>BC140-16<br>BC141-16                                  | 80<br>100             | -                    | -                        | V    |   |
|                                      | *V <sub>CEO</sub>     | I <sub>C</sub> = 30mA, I <sub>B</sub> = 0<br>BC140-16<br>BC141-16                                    | 40<br>60              |                      |                          |      |   |
| Emitter Base Voltage                 | V <sub>EBO</sub>      | I <sub>E</sub> = 100μA, I <sub>C</sub> = 0                                                           | 7                     |                      | -                        |      |   |
| Collector Cut off Current            | I <sub>CES</sub>      | V <sub>CE</sub> = 60V, V <sub>BE</sub> = 0                                                           | -                     |                      | 100                      | nA   |   |
|                                      |                       | V <sub>CE</sub> = 60V, V <sub>BE</sub> = 0, T <sub>a</sub> = 150°C                                   |                       |                      |                          | μA   |   |
| DC Current Gain                      | *h <sub>FE</sub>      | I <sub>C</sub> = 100mA, V <sub>CE</sub> = 1V<br>BC140-16/BC141-16<br>Group-6<br>Group-10<br>Group-16 | 40<br>40<br>63<br>100 |                      | 400<br>100<br>160<br>250 | -    |   |
|                                      |                       | I <sub>C</sub> = 1A, V <sub>CE</sub> = 1V<br>BC140-16/BC141-16<br>Group-6<br>Group-10<br>Group-16    | -                     | 26<br>15<br>20<br>30 | -                        |      |   |
| Collector Emitter Saturation Voltage | *V <sub>CE(sat)</sub> | I <sub>C</sub> = 1A, I <sub>B</sub> = 0.1A                                                           |                       | -                    | -                        | 1    | V |
| Base Emitter on Voltage              | *V <sub>BE(on)</sub>  | I <sub>C</sub> = 1A, V <sub>CE</sub> = 1V                                                            |                       |                      | -                        | 2    |   |

## Dynamic Characteristics

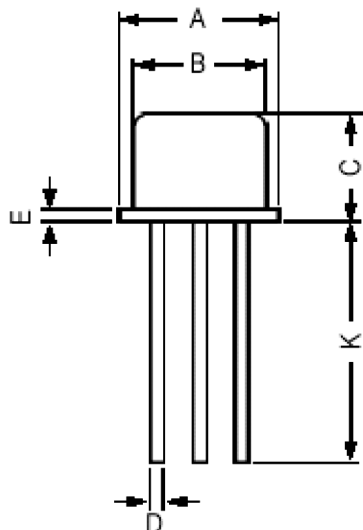
|                      |                 |                                                         |    |   |    |     |
|----------------------|-----------------|---------------------------------------------------------|----|---|----|-----|
| Transition Frequency | f <sub>T</sub>  | I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V, f = 20MHz | 50 | - | -  | MHz |
| Output Capacitance   | C <sub>ob</sub> | V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz     | -  |   | 25 | pF  |
| Input Capacitance    | C <sub>ib</sub> | V <sub>EB</sub> = 0.5V, I <sub>C</sub> = 0, f = 1MHz    |    |   | 80 |     |

## Switching Characteristics

|               |                  |                                                                   |   |   |     |    |
|---------------|------------------|-------------------------------------------------------------------|---|---|-----|----|
| Turn On Time  | t <sub>on</sub>  | I <sub>C</sub> = 150mA, I <sub>B1</sub> = 7.5mA                   | - | - | 250 | ns |
| Turn Off Time | t <sub>off</sub> | I <sub>C</sub> = 150mA, I <sub>B1</sub> = I <sub>B2</sub> = 7.5mA |   |   | 850 |    |

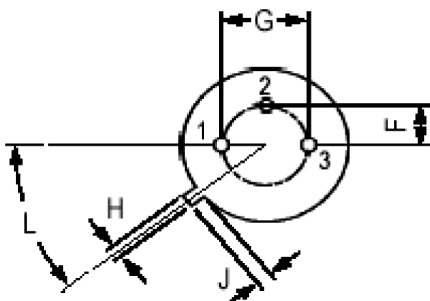
\*Pulsed : Pulse Duration ≤300μs, Duty Cycle ≤1%

## 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    |

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