

# Low Power Bipolar Transistors



## BC107 / BC108 Series

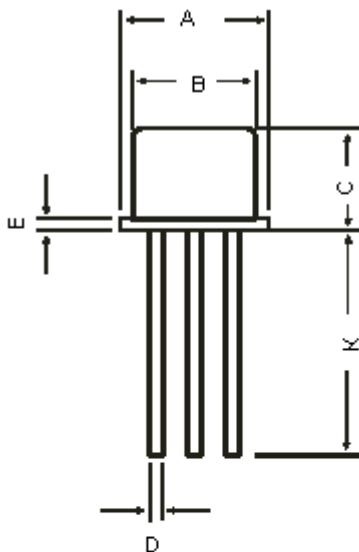
General Purpose Amplifier / Switches

Features:

- NPN Silicon Planar Epitaxial Transistors

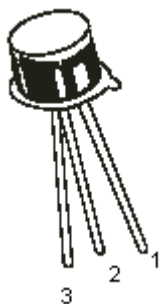
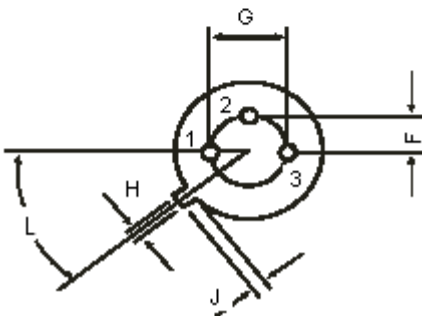


### TO-18 Metal Can Package



| Dimensions | Minimum | Maximum |
|------------|---------|---------|
| A          | 5.24    | 5.84    |
| B          | 4.52    | 4.97    |
| C          | 4.31    | 5.33    |
| D          | 0.4     | 0.53    |
| E          | -       | 0.76    |
| F          | -       | 1.27    |
| G          | -       | 2.97    |
| H          | 0.91    | 1.17    |
| J          | 0.71    | 1.21    |
| K          | 12.7    | -       |
| L          | 45°     | 45°     |

Dimensions : Millimetres



Pin Configuration:

1. Emitter
2. Base
3. Collector

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### Absolute Maximum Ratings

| Description                                                     | Symbol                            | BC107       | BC108 | Unit         |
|-----------------------------------------------------------------|-----------------------------------|-------------|-------|--------------|
| Collector-Emitter Voltage                                       | V <sub>CEO</sub>                  | 45          | 25    | V            |
| Collector-Base Voltage                                          | V <sub>CBO</sub>                  | 50          | 30    |              |
| Emitter-Base Voltage                                            | V <sub>EBO</sub>                  | 6           | 5     |              |
| Collector Current Continuous                                    | I <sub>C</sub>                    | 0.2         |       | A            |
| Power Dissipation at T <sub>a</sub> = 25°C<br>Derate Above 25°C | P <sub>D</sub>                    | 0.6<br>2.28 |       | W<br>mW / °C |
| Power Dissipation at T <sub>C</sub> = 25°C<br>Derate Above 25°C |                                   | 1<br>6.67   |       |              |
| Operating and Storage Junction Temperature Range                | T <sub>J</sub> , T <sub>stg</sub> | -65 to +200 |       | °C           |
| Thermal Resistance                                              |                                   |             |       |              |
| Junction to Case                                                | R <sub>th (j-c)</sub>             | 175         |       | °C / W       |

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

| Description                          | Symbol        | Test Condition                                                                            | Minimum    | Maximum      | Unit          |
|--------------------------------------|---------------|-------------------------------------------------------------------------------------------|------------|--------------|---------------|
| Collector-Emitter Voltage            | $V_{CEO}$     | $I_C = 2 \text{ mA}, I_B = 0$ BC107<br>BC108                                              | 45<br>25   | -            | V             |
| Collector-Base Voltage               | $V_{EBO}$     | $I_E = 10 \mu\text{A}, I_C = 0$ BC107<br>BC108                                            | 6<br>5     | -            |               |
| Collector-Cut off Current            | $I_{CBO}$     | $V_{CB} = 45 \text{ V}, I_E = 0$ BC107                                                    | -          | 15           | nA            |
|                                      |               | $V_{CB} = 25 \text{ V}, I_E = 0$ BC108                                                    |            | 15           |               |
|                                      |               | $T_{amb} = 125^\circ\text{C}$                                                             |            |              |               |
|                                      |               | $V_{CB} = 45 \text{ V}, I_E = 0$ BC107<br>$V_{CB} = 25 \text{ V}, I_E = 0$ BC108          |            | 4<br>4       | $\mu\text{A}$ |
| DC Current                           | $h_{FE}$      | $I_C = 10 \mu\text{A}, V_{CE} = 5 \text{ V}$<br>B Group                                   | 40         | -            | -             |
|                                      |               | C Group                                                                                   | 100        | -            |               |
|                                      |               | $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$<br>BC107                                       | 110        | 450          |               |
|                                      |               | BC108                                                                                     | 110        | 800          |               |
|                                      |               | A Group                                                                                   | 110        | 220          |               |
|                                      |               | B Group<br>C Group                                                                        | 200<br>420 | 450<br>800   |               |
| Base Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$<br>$I_C = 100 \text{ mA}, I_B = 5 \text{ mA}$ | -          | 0.83<br>1.05 | V             |
| Collector Emitter Saturation Voltage | $V_{CE(sat)}$ |                                                                                           | -          | 0.25<br>0.6  |               |
| Base Emitter on Voltage              | $V_{BE(on)}$  | $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$<br>$I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}$ | 0.55<br>-  | 0.7<br>0.77  |               |

# Low Power Bipolar Transistors

## BC107 / BC108 Series



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

| Description               | Symbol      | Test Condition                                                                                                               | Minimum                             | Maximum                             | Unit                   |
|---------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|------------------------|
| Collector Knee Voltage    | $V_{CE(K)}$ | $I_C = 10\text{ mA}$ , $I_B = \text{The Value for Which } I_C = 11\text{ mA at } V_{CE} = 1\text{ V}$                        | -                                   | 0.6                                 | V                      |
| Transition Frequency      | $f_t$       | $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$<br>$f = 100\text{ MHz}$                                                         | 150                                 | -                                   | MHz                    |
| Noise Figure              | NF          | $V_{CE} = 5\text{ V}$ , $I_C = 0.2\text{ mA}$<br>$R_g = 2\text{ k}\Omega$<br>$F = 1\text{ KHz}$ , $B = 200\text{ Hz}$        | -                                   | 10                                  | dB                     |
| Output Capacitance        | $C_{obo}$   | $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                                                                                  | -                                   | 4.5                                 | pF                     |
| Small Signal Current Gain | $h_{fe}$    | All $f = 1\text{ KHz}$<br>$I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>BC107<br>BC108<br><br>A Group<br>B Group<br>C Group | 125<br>125<br><br>125<br>240<br>450 | 500<br>900<br><br>260<br>500<br>900 | -                      |
| Input Impedance           | $h_{ie}$    | $I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>A Group<br>B Group<br>C Group                                                 | 1.6<br>3.2<br>6                     | 4.5<br>8.5<br>15                    | $K\Omega$<br>$K\Omega$ |
| Output Admittance         | $h_{oe}$    | $I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$<br>A Group<br>B Group<br>C Group                                                 | -                                   | 30<br>60<br>110                     | umhos                  |

### Specification Table

| $V_{CEO}$ (V) | $V_{CBO}$ Maximum (V) | $I_C$ (V) | $h_{FE}$ Minimum at $I_C = 2\text{ mA}$ | $f_T$ Minimum (*Typical) (V) | $P_{tot}$ (mW) | Type | Package | Part Number |
|---------------|-----------------------|-----------|-----------------------------------------|------------------------------|----------------|------|---------|-------------|
| 45            | 50                    | 0.1       | 110                                     | 150                          | 600            | NPN  | TO-18   | BC107       |
|               |                       |           | 200                                     |                              |                |      |         | BC107A      |
|               |                       |           |                                         |                              |                |      |         | BC107B      |
| 20            | 30                    |           | 110                                     |                              | 300            |      |         | BC108       |
|               |                       |           |                                         |                              |                |      |         | BC108B      |
|               |                       |           | 200                                     |                              | 600            |      |         | BC108C      |

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