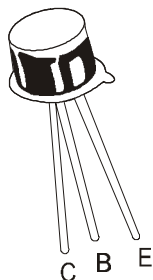


## NPN SILICON PLANAR TRANSISTORS



**BC107/A/B/C**  
**BC108/A/B/C**  
**BC109/A/B/C**

**TO-18**  
**Metal Can Package**

### Low Noise General Purpose Audio Amplifiers

#### ABSOLUTE MAXIMUM RATINGS

| DESCRIPTION                                                                   | SYMBOL         | BC107        | BC108 | BC109 | UNIT                 |
|-------------------------------------------------------------------------------|----------------|--------------|-------|-------|----------------------|
| Collector Emitter Voltage                                                     | $V_{CEO}$      | 45           | 25    | 25    | V                    |
| Collector Base Voltage                                                        | $V_{CBO}$      | 50           | 30    | 30    | V                    |
| Emitter Base Voltage                                                          | $V_{EBO}$      | 6.0          | 5.0   | 5.0   | V                    |
| Collector Current Continuous                                                  | $I_C$          | 200          |       |       | mA                   |
| Power Dissipation @ $T_a=25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 300          |       |       | mW                   |
|                                                                               |                | 1.72         |       |       | mW/ $^\circ\text{C}$ |
| Power Dissipation @ $T_c=25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 750          |       |       | mW                   |
|                                                                               |                | 4.29         |       |       | mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range                              | $T_j, T_{stg}$ | - 65 to +200 |       |       | $^\circ\text{C}$     |

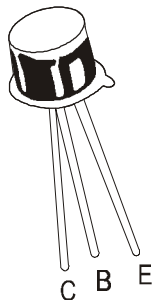
#### THERMAL CHARACTERISTICS

|                                 |               |     |                    |
|---------------------------------|---------------|-----|--------------------|
| Junction to Ambient in free air | $R_{th(j-a)}$ | 583 | $^\circ\text{C/W}$ |
| Junction to Case                | $R_{th(j-c)}$ | 233 | $^\circ\text{C/W}$ |

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

| DESCRIPTION               | SYMBOL    | TEST CONDITION                                                                                                                           | BC107                                                          | BC108 | BC109 | UNIT          |
|---------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------|-------|---------------|
| Collector Emitter Voltage | $V_{CEO}$ | $I_C=2\text{mA}, I_B=0$                                                                                                                  | >45                                                            | >25   | >25   | V             |
| Emitter Base Voltage      | $V_{EBO}$ | $I_E=10\mu\text{A}, I_C=0$                                                                                                               | >6                                                             | >5    | >5    | V             |
| Collector Cut off Current | $I_{CBO}$ | $V_{CB}=45\text{V}, I_E=0$                                                                                                               | <15                                                            |       |       | nA            |
|                           |           | $V_{CB}=25\text{V}, I_E=0$                                                                                                               |                                                                | <15   | <15   | nA            |
|                           |           | $V_{CB}=45\text{V}, I_E=0, T_a=125^\circ\text{C}$                                                                                        | <4                                                             |       |       | $\mu\text{A}$ |
|                           |           | $V_{CB}=25\text{V}, I_E=0, T_a=125^\circ\text{C}$                                                                                        |                                                                | <4    | <4    | $\mu\text{A}$ |
| DC Current Gain           | $h_{FE}$  | $I_C=10\mu\text{A}, V_{CE}=5\text{V}$<br><b>B Group</b><br><b>C Group</b>                                                                | >40<br>>100                                                    |       |       |               |
|                           |           | $I_C=2\text{mA}, V_{CE}=5\text{V}$<br><b>BC107</b><br><b>BC108</b><br><b>BC109</b><br><b>A Group</b><br><b>B Group</b><br><b>C Group</b> | 110-450<br>110-800<br>200-800<br>110-220<br>200-450<br>420-800 |       |       |               |

# NPN SILICON PLANAR TRANSISTORS



**BC107/A/B/C**  
**BC108/A/B/C**  
**BC109/A/B/C**

**TO-18**  
**Metal Can Package**

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

| DESCRIPTION                          | SYMBOL        | TEST CONDITION                                                                                                      | MIN  | TYP | MAX  | UNIT |
|--------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------|------|-----|------|------|
| Collector Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=10\text{mA}$ , $I_B=0.5\text{mA}$                                                                              |      |     | 0.25 | V    |
|                                      |               | $I_C=100\text{mA}$ , $I_B=5\text{mA}$                                                                               |      |     | 0.60 | V    |
| Base Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=10\text{mA}$ , $I_B=0.5\text{mA}$                                                                              |      |     | 0.83 | V    |
|                                      |               | $I_C=100\text{mA}$ , $I_B=5\text{mA}$                                                                               |      |     | 1.05 | V    |
| Base Emitter on Voltage              | $V_{BE(on)}$  | $I_C=2\text{mA}$ , $V_{CE}=5\text{V}$                                                                               | 0.55 |     | 0.70 | V    |
|                                      |               | $I_C=10\text{mA}$ , $V_{CE}=5\text{V}$                                                                              |      |     | 0.77 | V    |
| Collector Knee Voltage               | $V_{CE(K)}$   | $I_C=10\text{mA}$ , $I_B=\text{the value for which}$<br>$I_C=11\text{mA @ } V_{CE}=1\text{V}$                       |      |     | 0.60 | V    |
| Transition frequency                 | $f_T$         | $I_C=10\text{mA}$ , $V_{CE}=5\text{V}$ , $f=100\text{MHz}$                                                          | 150  |     |      | MHz  |
| Output Capacitance                   | $C_{obo}$     | $V_{CB}=10\text{V}$ , $I_E=0$ , $f=1\text{MHz}$                                                                     |      |     | 4.5  | pF   |
| Noise Figure                         | NF            | $I_C=0.2\text{mA}$ , $V_{CE}=5\text{V}$ , $R_g=2\text{K}\Omega$ ,<br>$f=30\text{Hz}$ to $15\text{KHz}$ <b>BC109</b> |      |     | 4.0  | dB   |
|                                      |               | $f=1\text{KHz}$ , $\Delta F=200\text{Hz}$ , <b>BC109</b>                                                            |      |     | 4.0  | dB   |
|                                      |               | <b>BC107/108</b>                                                                                                    |      |     | 10   | dB   |

## SMALL SIGNAL CHARACTERISTICS

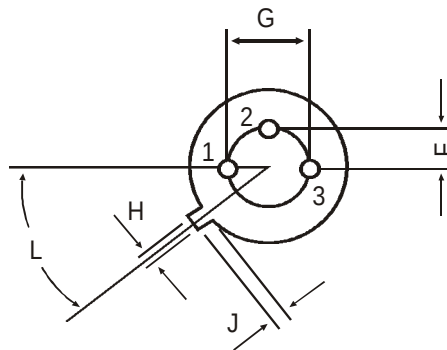
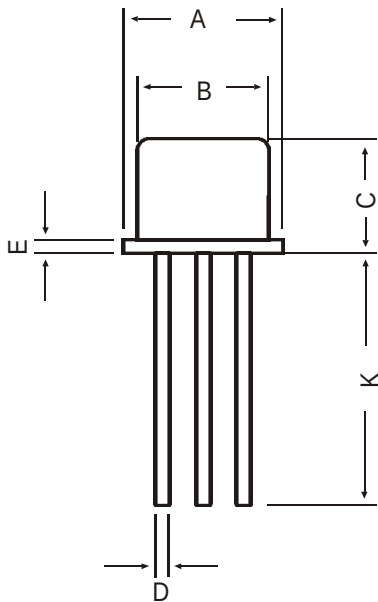
| DESCRIPTION               | SYMBOL   | TEST CONDITION                                          | MIN | TYP | MAX | UNIT             |
|---------------------------|----------|---------------------------------------------------------|-----|-----|-----|------------------|
| Small Signal Current Gain | $h_{fe}$ | $I_C=2\text{mA}$ , $V_{CE}=5\text{V}$ , $f=1\text{KHz}$ |     |     |     |                  |
|                           |          | <b>BC107</b>                                            | 125 |     | 500 |                  |
|                           |          | <b>BC108</b>                                            | 125 |     | 900 |                  |
|                           |          | <b>BC109</b>                                            | 240 |     | 900 |                  |
|                           |          | <b>A Group</b>                                          | 125 |     | 260 |                  |
|                           |          | <b>B Group</b>                                          | 240 |     | 500 |                  |
| Input Impedance           | $h_{ie}$ | $I_C=2\text{mA}$ , $V_{CE}=5\text{V}$ , $f=1\text{KHz}$ |     |     |     |                  |
|                           |          | <b>A Group</b>                                          | 1.6 |     | 4.5 | $\text{K}\Omega$ |
|                           |          | <b>B Group</b>                                          | 3.2 |     | 8.5 | $\text{K}\Omega$ |
|                           |          | <b>C Group</b>                                          | 6.0 |     | 15  | $\text{K}\Omega$ |
| Output Admittance         | $h_{oe}$ | $I_C=2\text{mA}$ , $V_{CE}=5\text{V}$ , $f=1\text{KHz}$ |     |     |     |                  |
|                           |          | <b>A Group</b>                                          |     |     | 30  | $\mu\text{mhos}$ |
|                           |          | <b>B Group</b>                                          |     |     | 60  | $\mu\text{mhos}$ |
|                           |          | <b>C Group</b>                                          |     |     | 110 | $\mu\text{mhos}$ |

BC107\_109Rev\_3 231202E

BC107/A/B/C  
BC108/A/B/C  
BC109/A/B/C

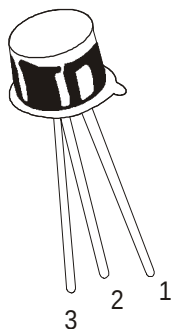
TO-18  
Metal Can Package

TO-18 Metal Can Package



All dimensions in mm.

| DIM | MIN    | MAX  |
|-----|--------|------|
| A   | 5.24   | 5.84 |
| B   | 4.52   | 4.97 |
| C   | 4.31   | 5.33 |
| D   | 0.40   | 0.53 |
| E   | —      | 0.76 |
| F   | —      | 1.27 |
| G   | —      | 2.97 |
| H   | 0.91   | 1.17 |
| J   | 0.71   | 1.21 |
| K   | 12.70  | —    |
| L   | 45 DEG |      |



PIN CONFIGURATION

1. EMITTER
2. BASE
3. COLLECTOR

Packing Detail

| PACKAGE | STANDARD PACK |                 | INNER CARTON BOX |     | OUTER CARTON BOX  |     |        |
|---------|---------------|-----------------|------------------|-----|-------------------|-----|--------|
|         | Details       | Net Weight /Qty | Size             | Qty | Size              | Qty | Gr Wt  |
| TO-18   | 1K/polybag    | 350 gm/1K pcs   | 3" x 7.5" x 7.5" | 5K  | 17" x 15" x 13.5" | 80K | 34 kgs |

### **Disclaimer**

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