

# Central<sup>TM</sup> Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors

BC107,A,B  
BC108,A,B,C  
BC109,B,C

NPN SILICON TRANSISTOR

JEDEC TO-18 CASE

## DESCRIPTION

The CENTRAL SEMICONDUCTOR BC107, BC108, BC109 series types are silicon NPN small signal transistors manufactured by the epitaxial planar process designed for general purpose amplifier applications.

## MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ )

|                           | SYMBOL         | BC107       | BC108 | BC109 | UNIT                      |
|---------------------------|----------------|-------------|-------|-------|---------------------------|
| Collector-Base Voltage    | $V_{CB0}$      | 50          | 30    | 30    | V                         |
| Collector-Emitter Voltage | $V_{CES}$      | 50          | 30    | 30    | V                         |
| Collector-Emitter Voltage | $V_{CE0}$      | 45          | 20    | 20    | V                         |
| Emitter-Base Voltage      | $V_{EB0}$      | 6.0         | 5.0   | 5.0   | V                         |
| Collector Current         | $I_C$          |             | 100   |       | mA                        |
| Collector Current (PEAK)  | $I_{CM}$       |             | 200   |       | mA                        |
| Base Current (PEAK)       | $I_{BM}$       |             | 200   |       | mA                        |
| Emitter Current (PEAK)    | $I_{EM}$       |             | 200   |       | mA                        |
| Power Dissipation         | $P_D$          |             | 300   |       | mW                        |
| Operating and Storage     |                |             |       |       |                           |
| Junction Temperature      | $T_J, T_{STG}$ | -65 to +200 |       |       | $^\circ\text{C}$          |
| Thermal Resistance        | $\theta_{JA}$  |             | 500   |       | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance        | $\theta_{JC}$  |             | 200   |       | $^\circ\text{C}/\text{W}$ |

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

| SYMBOL               | TEST CONDITIONS                                                  | MIN  | TYP | MAX  | UNIT          |
|----------------------|------------------------------------------------------------------|------|-----|------|---------------|
| $I_{CB0}$            | $V_{CB}=30\text{V}$ (BC107)                                      |      |     | 15   | nA            |
| $I_{CB0}$            | $V_{CB}=30\text{V}, T_A=150^\circ\text{C}$ (BC107)               |      |     | 15   | $\mu\text{A}$ |
| $I_{CB0}$            | $V_{CB}=20\text{V}$ , (BC108, BC109)                             |      |     | 15   | nA            |
| $I_{CB0}$            | $V_{CB}=20\text{V}, T_A=150^\circ\text{C}$ (BC108, BC109)        |      |     | 15   | $\mu\text{A}$ |
| $BV_{CB0}$           | $I_C=10\mu\text{A}$ (BC107)                                      | 50   |     |      | V             |
| $BV_{CB0}$           | $I_C=10\mu\text{A}$ (BC108, BC109)                               | 30   |     |      | V             |
| $BV_{CE0}$           | $I_C=10\text{mA}$ (BC107)                                        | 45   |     |      | V             |
| $BV_{CE0}$           | $I_C=10\text{mA}$ (BC108, BC109)                                 | 20   |     |      | V             |
| $BV_{EB0}$           | $I_E=10\mu\text{A}$ (BC107)                                      | 6.0  |     |      | V             |
| $BV_{EB0}$           | $I_E=10\mu\text{A}$ (BC108, BC109)                               | 5.0  |     |      | V             |
| $V_{CE}(\text{SAT})$ | $I_C=10\text{mA}, I_B=0.5\text{mA}$                              |      |     | .250 | V             |
| $V_{CE}(\text{SAT})$ | $I_C=100\text{mA}, I_B=5.0\text{mA}$                             |      |     | .600 | V             |
| $V_{BE}(\text{ON})$  | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$                           | .550 |     | .700 | V             |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ (BC107,A, BC108,A)       |      | 90  |      |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ (BC107B, BC108B, BC109B) | 40   | 150 |      |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ (BC109)                  | 40   | 210 |      |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ (BC108C, BC109C)         | 100  | 270 |      |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$ (BC107)                   | 110  |     | 450  |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$ (BC107A, BC108A)          | 110  |     | 220  |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$ (BC107B, BC108B, BC109B)  | 200  |     | 450  |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$ (BC108)                   | 110  |     | 800  |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$ (BC109)                   | 200  |     | 800  |               |
| $h_{FE}$             | $V_{CE}=5.0\text{V}, I_C=2.0\text{mA}$ (BC108C, BC109C)          | 420  |     | 800  |               |

ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$  unless otherwise noted) continued:

| <u>SYMBOL</u> | <u>TEST CONDITIONS</u>                                                                                                    | <u>MIN</u> | <u>TYP</u> | <u>MAX</u> | <u>UNIT</u> |
|---------------|---------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-------------|
| $h_{fe}$      | $V_{CE}=5.0\text{V}$ , $I_C=2.0\text{mA}$ , $f=1.0\text{kHz}$ (BC107)                                                     |            | 250        |            |             |
| $h_{fe}$      | $V_{CE}=5.0\text{V}$ , $I_C=2.0\text{mA}$ , $f=1.0\text{kHz}$ (BC107A, BC108A)                                            |            | 190        |            |             |
| $h_{fe}$      | $V_{CE}=5.0\text{V}$ , $I_C=2.0\text{mA}$ , $f=1.0\text{kHz}$ (BC107B, BC108B, BC109B)                                    |            | 300        |            |             |
| $h_{fe}$      | $V_{CE}=5.0\text{V}$ , $I_C=2.0\text{mA}$ , $f=1.0\text{kHz}$ (BC108, BC109)                                              |            | 370        |            |             |
| $h_{fe}$      | $V_{CE}=5.0\text{V}$ , $I_C=2.0\text{mA}$ , $f=1.0\text{kHz}$ (BC108C)                                                    |            | 500        |            |             |
| $h_{fe}$      | $V_{CE}=5.0\text{V}$ , $I_C=2.0\text{mA}$ , $f=1.0\text{kHz}$ (BC109C)                                                    |            | 550        |            |             |
| $f_T$         | $V_{CE}=10\text{V}$ , $I_C=10\text{mA}$ , $f=100\text{MHz}$                                                               |            | 200        |            | MHz         |
| $C_{ob}$      | $V_{CB}=10\text{V}$ , $I_E=0$ , $f=1.0\text{MHz}$                                                                         |            | 4.0        | 6.0        | pF          |
| $C_{ib}$      | $V_{EB}=0.5\text{V}$ , $I_C=0$ , $f=1.0\text{MHz}$                                                                        |            | 12         |            | pF          |
| NF            | $V_{CE}=5.0\text{V}$ , $I_C=0.2\text{mA}$ , $R_g=2.0\text{k}\Omega$ , $B=200\text{Hz}$ , $f=1.0\text{kHz}$ (BC107, BC108) |            |            | 10         | dB          |
| NF            | $V_{CE}=5.0\text{V}$ , $I_C=0.2\text{mA}$ , $R_g=2.0\text{k}\Omega$ , $B=200\text{Hz}$ , $f=1.0\text{kHz}$ (BC109)        |            |            | 4.0        | dB          |
| NF            | $V_{CE}=5.0\text{V}$ , $I_C=0.2\text{mA}$ , $R_g=2.0\text{k}\Omega$ , $f=30\text{Hz}$ to $15\text{kHz}$ (BC109)           |            |            | 4.0        | dB          |

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