

Low Power Bipolar Transistors



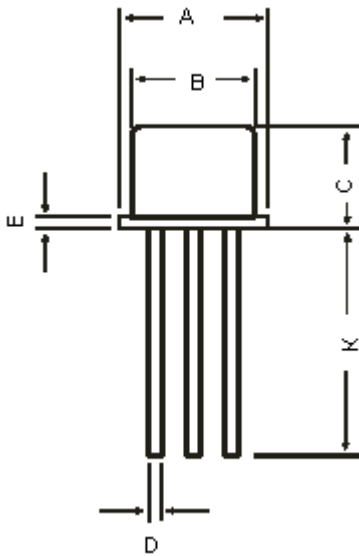
BC109 Series



Feature:

- NPN Silicon Planar Epitaxial Transistors

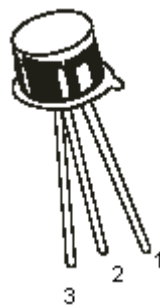
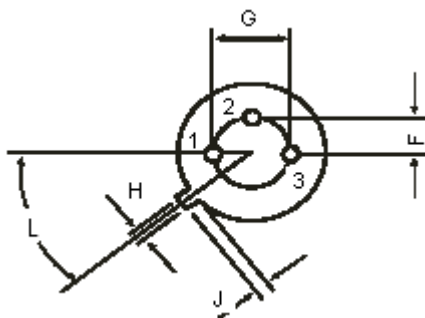
TO-18 Metal Can Package



Specification Table

| 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° | |

Dimensions : Millimetres



Pin Configuration:

- Emitter
- Base
- Collector

Absolute Maximum Ratings

| Description | Symbol | BC109 | Unit |
|------------------------------|-----------|-------|------|
| Collector - Emitter Voltage | V_{CEO} | 25 | V |
| Collector - Base Voltage | V_{CBO} | 30 | |
| Emitter-Base Voltage | V_{EBO} | 5 | |
| Collector Current Continuous | I_C | 0.2 | A |

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Absolute Maximum Ratings

| Description | Symbol | BC109 | Unit |
|--|----------------|-------------|-----------------------------|
| Power Dissipation at $T_a = 25^\circ\text{C}$ Derate above 25°C | P_D | 0.6 2.28 | W mW / $^\circ\text{C}$ |
| Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C | | 1 6.67 | |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -65 to +200 | $^\circ\text{C}$ |
| Thermal Resistance | | | |
| Junction to Case | $R_{th(j-c)}$ | 175 | $^\circ\text{C} / \text{W}$ |

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

| Description | Symbol | Test Condition | Minimum | Maximum | Unit |
|--------------------------------------|---------------|--|-------------------|-------------------|---------------|
| Collector - Emitter Voltage | V_{CEO} | $I_C = 2 \text{ mA}, I_B = 0$ | 25 | - | V |
| Emitter Base Voltage | V_{EBO} | $I_E = 10 \mu\text{A}, I_C = 0$ | 5 | - | |
| Collector Cut off Current | I_{CBO} | $V_{CB} = 25 \text{ V}, I_E = 0$ $T_{amb} = 125^\circ\text{C}$ | - | 15 | nA |
| | | $V_{CB} = 25 \text{ V}, I_E = 0$ | - | 4 | μA |
| DC Current | h_{FE} | $I_C = 10 \mu\text{A}, V_{CE} = 5 \text{ V}$ B Group C Group | 40 100 | - | - |
| | | $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$ B Group C Group | 200 200 420 | 800 450 800 | |
| | | | | | |
| Base Emitter Saturation Voltage | $V_{BE(Sat)}$ | $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$ $I_C = 100 \text{ mA}, I_B = 5 \text{ mA}$ | - | 0.83 1.05 | V |
| Collector Emitter Saturation Voltage | $V_{CE(Sat)}$ | | - | 0.25 0.6 | |
| Base Emitter On Voltage | $V_{BE(on)}$ | $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$ $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}$ | 0.55 - | 0.7 0.77 | |
| 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 | |
| Transition Frequency | f_t | $V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}, f = 100 \text{ MHz}$ | 150 | - | MHz |
| Noise Figure | NF | $V_{CE} = 5 \text{ V}, I_C = 0.2 \text{ mA}$ $R_g = 2 \text{ k}\Omega$ $F = 30 \text{ Hz to } 15 \text{ KHz}$ $F = 1 \text{ kHz}, B = 200 \text{ Hz}$ | - | 4 4 | dB dB |
| | | | | | |
| Output Capacitance | C_{obo} | $V_{CB} = 10 \text{ V}, f = 1\text{MHz}$ | - | 4.5 | pF |
| Small Signal Current Gain | h_{fe} | ALL $f = 1 \text{ kHz}$ $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$ B Group C Group | 240 240 450 | 900 500 900 | - |
| | | | | | |
| | | | | | |

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

| Description | Symbol | Test Condition | Minimum | Maximum | Unit |
|-------------------|----------|--|---------|---------|------------------|
| Input Impedance | h_{ie} | $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$ | | | |
| | | B Group | 3.2 | 8.5 | $\text{K}\Omega$ |
| | | C Group | 6 | 15 | $\text{K}\Omega$ |
| Output Admittance | h_{oe} | $I_C = 2 \text{ mA}, V_{CE} = 5 \text{ V}$ | | | |
| | | B Group | - | 60 | $\mu\Omega$ |
| | | C Group | | 110 | |

Part Number Table

| Package | Part Number |
|------------------------|-------------|
| Transistor, NPN, TO-18 | BC109 |
| Transistor, NPN, TO-18 | BC109B |
| Transistor, NPN, TO-18 | BC109C |

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