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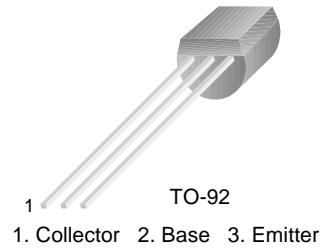
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## BC307/308/309

### Switching and Amplifier Applications

- Low Noise: BC309



### PNP Epitaxial Silicon Transistor

#### Absolute Maximum Ratings $T_a=25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter                   | Value     | Units            |
|-----------|-----------------------------|-----------|------------------|
| $V_{CES}$ | Collector-Emitter Voltage   |           |                  |
|           | : BC307                     | -50       | V                |
|           | : BC308/309                 | -30       | V                |
| $V_{CEO}$ | Collector-Emitter Voltage   |           |                  |
|           | : BC307                     | -45       | V                |
|           | : BC308/309                 | -25       | V                |
| $V_{EBO}$ | Emitter-Base Voltage        | -5        | V                |
| $I_C$     | Collector Current (DC)      | -100      | mA               |
| $P_C$     | Collector Power Dissipation | 500       | mW               |
| $T_J$     | Junction Temperature        | 150       | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature         | -55 ~ 150 | $^\circ\text{C}$ |

**Electrical Characteristics**  $T_a=25^\circ\text{C}$  unless otherwise noted

| Symbol               | Parameter                                                     | Test Condition                                                                                                                                                                            | Min.       | Typ.          | Max.         | Units          |
|----------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|--------------|----------------|
| $BV_{CEO}$           | Collector-Emitter Breakdown Voltage<br>: BC307<br>: BC308/309 | $I_C = -2\text{mA}, I_B = 0$                                                                                                                                                              | -45<br>-25 |               |              | V<br>V         |
| $BV_{CES}$           | Collector-Emitter Breakdown Voltage<br>: BC307<br>: BC308/309 | $I_C = -10\mu\text{A}, V_{BE} = 0$                                                                                                                                                        | -50<br>-30 |               |              | V<br>V         |
| $BV_{EBO}$           | Emitter-Base Breakdown Voltage                                | $I_E = -10\mu\text{A}, I_C = 0$                                                                                                                                                           | -5         |               |              | V              |
| $I_{CES}$            | Collector Cut-off Current<br>: BC307<br>: BC308/309           | $V_{CE} = -45\text{V}, V_{BE} = 0$<br>$V_{CE} = -25\text{V}, V_{BE} = 0$                                                                                                                  |            | -2<br>-2      | -15<br>-15   | nA<br>nA       |
| $h_{FE}$             | DC Current Gain                                               | $V_{CE} = -5\text{V}, I_C = -2\text{mA}$                                                                                                                                                  | 120        |               | 800          |                |
| $V_{CE}(\text{sat})$ | Collector-Emitter Saturation Voltage                          | $I_C = -10\text{mA}, I_B = -0.5\text{mA}$<br>$I_C = -100\text{mA}, I_B = -5\text{mA}$                                                                                                     |            | -0.5          | -0.3         | V<br>V         |
| $V_{BE}(\text{sat})$ | Collector-Base Saturation Voltage                             | $I_C = -10\text{mA}, I_B = -0.5\text{mA}$<br>$I_C = -100\text{mA}, I_B = -5\text{mA}$                                                                                                     |            | -0.7<br>-0.85 |              | V<br>V         |
| $V_{BE}(\text{on})$  | Base-Emitter On Voltage                                       | $V_{CE} = -5\text{V}, I_C = -2\text{mA}$                                                                                                                                                  | -0.55      | -0.62         | -0.7         | V              |
| $f_T$                | Current Gain Bandwidth Product                                | $V_{CE} = -5\text{V}, I_C = -10\text{mA}, f = 50\text{MHz}$                                                                                                                               |            | 130           |              | MHz            |
| $C_{ob}$             | Output Capacitance                                            | $V_{CB} = -10\text{V}, I_E = 0, f = 1\text{MHz}$                                                                                                                                          |            |               | 6            | pF             |
| $C_{ib}$             | Input Capacitance                                             | $V_{EB} = -0.5\text{V}, I_C = 0, f = 1\text{MHz}$                                                                                                                                         |            | 12            |              | pF             |
| NF                   | Noise Figure<br>: BC307/308<br>: BC309<br>: BC309             | $V_{CE} = -5\text{V}, I_C = -0.2\text{mA},$<br>$R_G = 2\text{K}\Omega, f = 1\text{KHz}$<br>$V_{CE} = -5\text{V}, I_C = -0.2\text{mA}$<br>$R_G = 2\text{K}\Omega, f = 30\sim 15\text{KHz}$ |            |               | 10<br>4<br>4 | dB<br>dB<br>dB |

 **$h_{FE}$  Classification**

| Classification | A         | B         | C         |
|----------------|-----------|-----------|-----------|
| $h_{FE}$       | 120 ~ 220 | 180 ~ 460 | 380 ~ 800 |

# Typical Characteristics

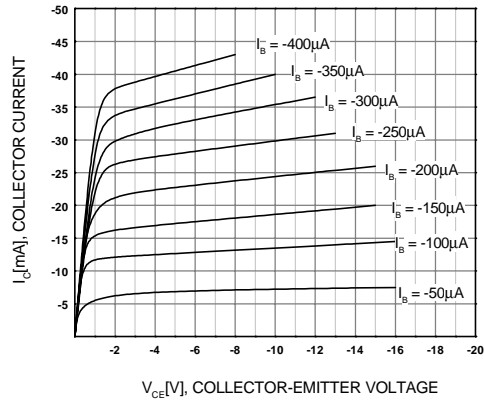


Figure 1. Static Characteristic

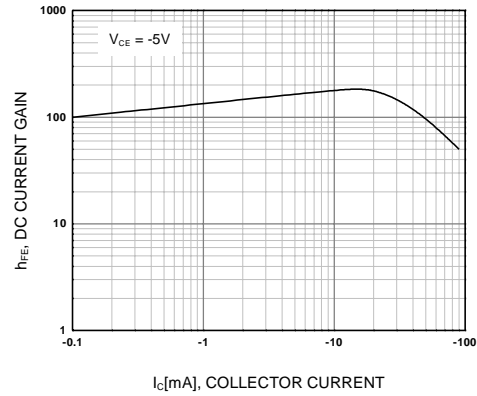


Figure 2. DC current Gain

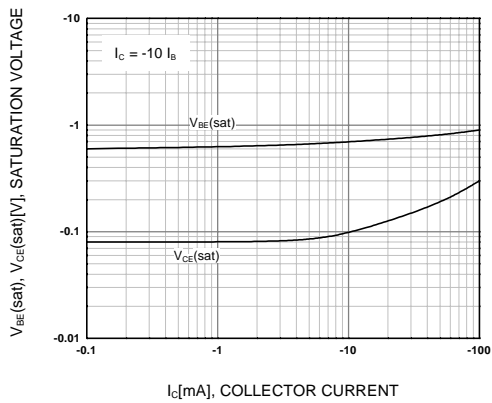


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emmitter Saturation Voltage

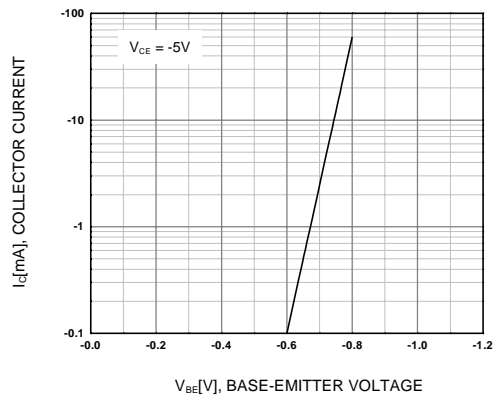


Figure 4. Base-Emitter Capacitance

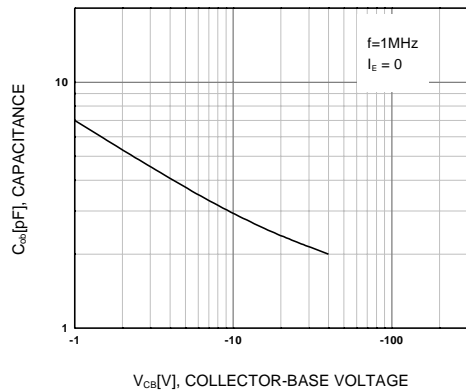


Figure 5. Collector Output Capacitance

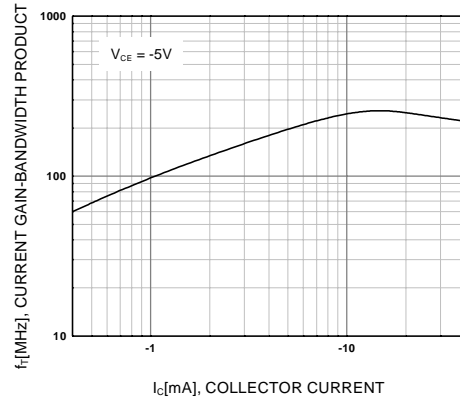
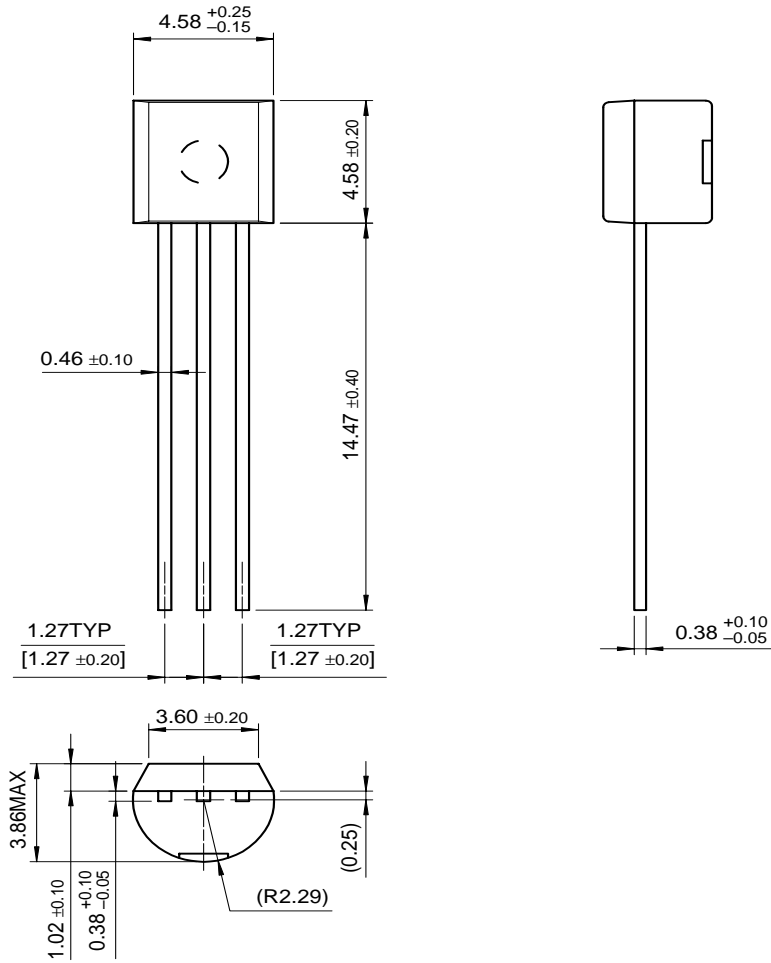


Figure 6. Current Gain Bandwidth Product

# Package Dimensions

BC307/308/309

## TO-92



Dimensions in Millimeters

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| CoolFET <sup>™</sup>                             | FAST <sup>™</sup>               | MicroFET <sup>™</sup>          | PowerTrench <sup>®</sup>        | SuperSOT <sup>™</sup> -6    |
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