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November 2015

## BC63916

### NPN Epitaxial Silicon Transistor

#### Features

- Switching and Amplifier Applications



#### Ordering Information

| Part Number  | Top Mark | Package  | Packing Method |
|--------------|----------|----------|----------------|
| BC63916_D74Z | BC639-16 | TO-92 3L | Ammo           |
| BC63916_D27Z | BC639-16 | TO-92 3L | Tape and Reel  |

#### Absolute Maximum Ratings<sup>(1)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol                         | Parameter                                                        | Value      | Unit             |
|--------------------------------|------------------------------------------------------------------|------------|------------------|
| $V_{\text{CER}}$               | Collector-Emitter Voltage at $R_{\text{BE}} = 1 \text{ k}\Omega$ | 100        | V                |
| $V_{\text{CES}}$               | Collector-Emitter Voltage                                        | 100        | V                |
| $V_{\text{CEO}}$               | Collector-Emitter Voltage                                        | 80         | V                |
| $V_{\text{EBO}}$               | Emitter-Base Voltage                                             | 5          | V                |
| $I_{\text{C}}$                 | Collector Current                                                | 1          | A                |
| $T_{\text{J}}, T_{\text{STG}}$ | Operating and Storage Junction Temperature Range                 | -55 to 150 | $^\circ\text{C}$ |

#### Note:

1. Pulse test: pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

**Thermal Characteristics<sup>(2)</sup>**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol          | Parameter                               | Value | Unit                 |
|-----------------|-----------------------------------------|-------|----------------------|
| $P_D$           | Power Dissipation                       | 830   | mW                   |
|                 | Derate Above $T_A = 25^\circ\text{C}$   | 6.6   | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 150   | $^\circ\text{C/W}$   |

**Note:**

2. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

**Electrical Characteristics**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol        | Parameter                            | Conditions                                                               | Min. | Typ. | Max. | Unit          |
|---------------|--------------------------------------|--------------------------------------------------------------------------|------|------|------|---------------|
| $BV_{CBO}$    | Collector-Base Breakdown Voltage     | $I_C = 100\ \mu\text{A}$ , $I_E = 0$                                     | 100  |      |      | V             |
| $BV_{CEO}$    | Collector-Emitter Breakdown Voltage  | $I_C = 10\ \text{mA}$ , $I_B = 0$                                        | 80   |      |      | V             |
| $BV_{EBO}$    | Emitter-Base Breakdown Voltage       | $I_E = 10\ \mu\text{A}$ , $I_C = 0$                                      | 5.0  |      |      | V             |
| $I_{CBO}$     | Collector Cut-Off Current            | $V_{CB} = 30\ \text{V}$ , $I_E = 0$                                      |      |      | 100  | nA            |
| $I_{EBO}$     | Emitter Cut-Off Current              | $V_{EB} = 5\ \text{V}$ , $I_C = 0$                                       |      |      | 10   | $\mu\text{A}$ |
| $h_{FE1}$     | DC Current Gain                      | $V_{CE} = 2\ \text{V}$ , $I_C = 5\ \text{mA}$                            | 25   |      |      |               |
| $h_{FE2}$     |                                      | $V_{CE} = 2\ \text{V}$ , $I_C = 150\ \text{mA}$                          | 100  |      | 250  |               |
| $h_{FE3}$     |                                      | $V_{CE} = 2\ \text{V}$ , $I_C = 500\ \text{mA}$                          | 25   |      |      |               |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 500\ \text{mA}$ , $I_B = 50\ \text{mA}$                           |      |      | 0.5  | V             |
| $V_{BE(on)}$  | Base-Emitter On Voltage              | $V_{CE} = 2\ \text{V}$ , $I_C = 500\ \text{mA}$                          |      |      | 1    | V             |
| $f_T$         | Current Gain Bandwidth Product       | $V_{CE} = 5\ \text{V}$ , $I_C = 10\ \text{mA}$ ,<br>$f = 50\ \text{MHz}$ |      | 100  |      | MHz           |

## Typical Performance Characteristics

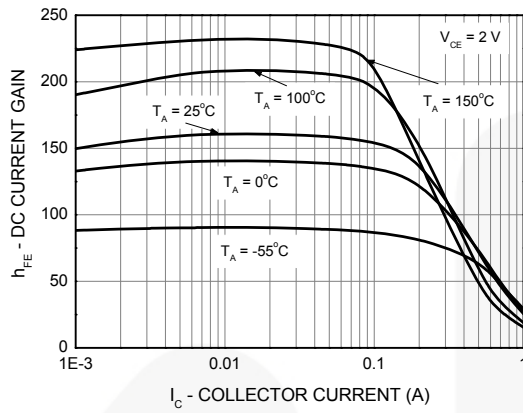


Figure 1. DC Current Gain

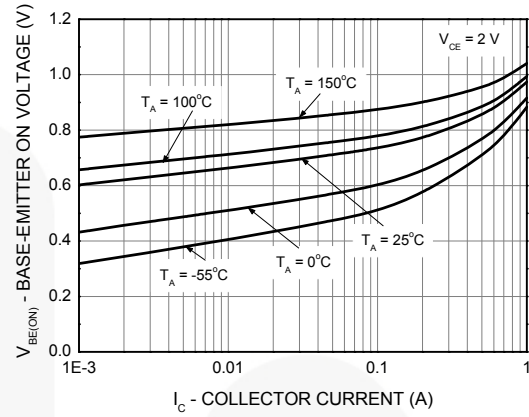


Figure 2. Base-Emitter On Voltage

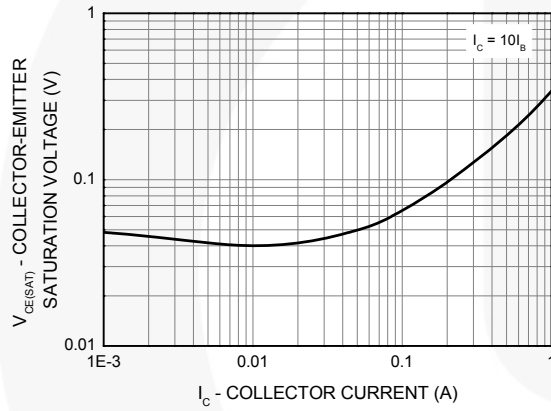


Figure 3. Collector-Emitter Saturation Voltage

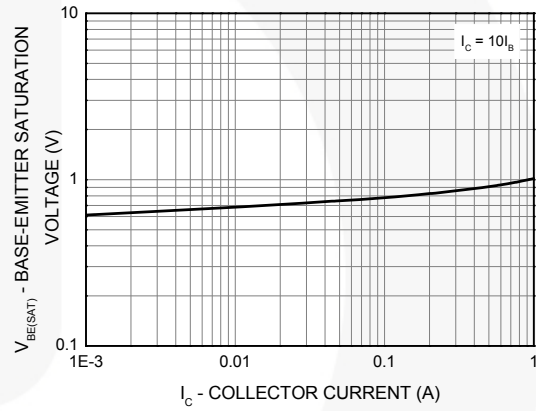
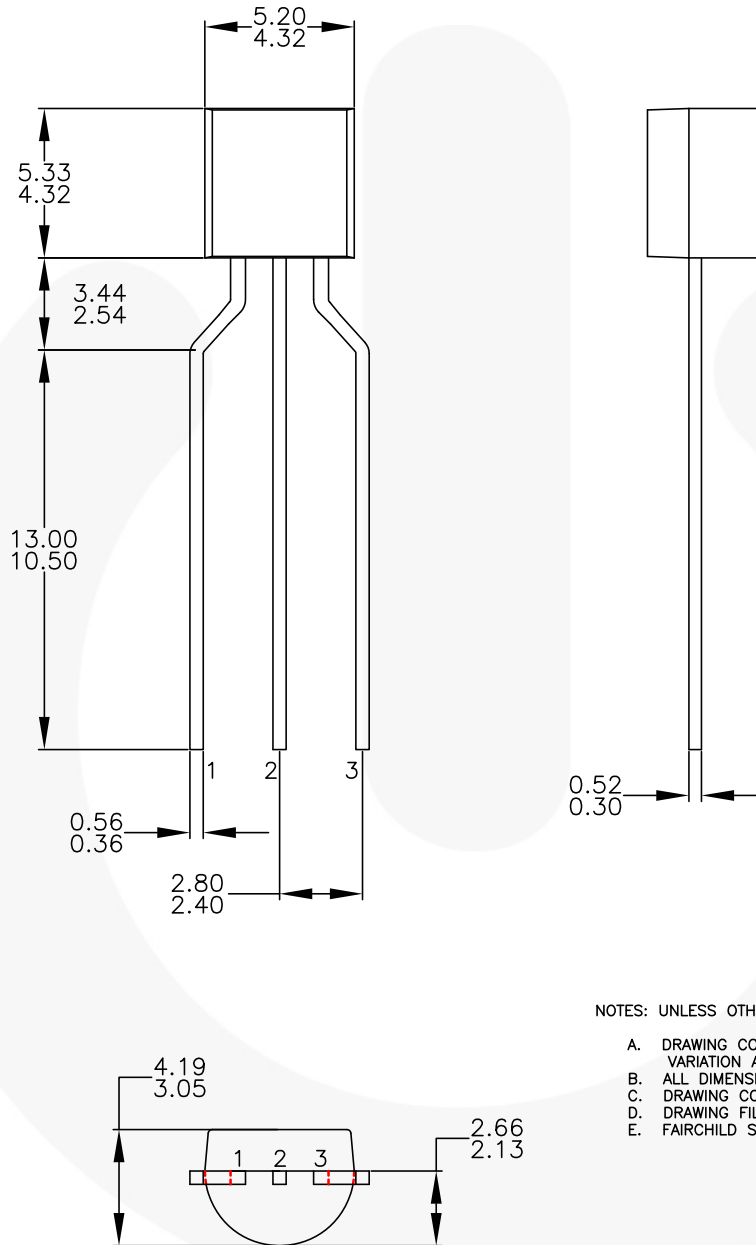


Figure 4. Base-Emitter Saturation Voltage

# Physical Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

- A. DRAWING CONFORMS TO JEDEC MS-013, VARIATION AC.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DRAWING CONFORMS TO ASME Y14.5M-2009.
- D. DRAWING FILENAME: MKT-ZA03FREV3.
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Figure 5. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form



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Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

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