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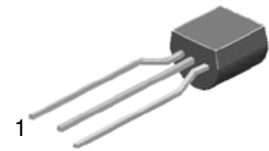


August 2015

# BC516 PNP Darlington Transistor

## Features

- This device is designed for applications requiring extremely high current gain at currents to 1 A.
- Sourced from process 61.



TO-92

1. Collector 2. Base 3. Emitter

## Ordering Information

| Part Number | Top Mark | Package  | Packing Method |
|-------------|----------|----------|----------------|
| BC516_D27Z  | BC516    | TO-92 3L | Tape and Reel  |

## Absolute Maximum Ratings

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             |
|----------------|--|-------------|------------------|
| $V_{CEO}$      | Collector-Emitter Voltage                        | -30         | V                |
| $V_{CBO}$      | Collector-Base Voltage                           | -40         | V                |
| $V_{EBO}$      | Emitter-Base Voltage                             | -10         | V                |
| $I_C$          | Collector Current - Continuous                   | -1          | A                |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ\text{C}$ |

**Thermal Characteristics<sup>(1)</sup>**

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

| Symbol          | Parameter  | Max. | Unit                      |
|-----------------|--|------|---------------------------|
| $P_D$           | Total Device Dissipation, $T_A = 25^\circ\text{C}$ | 625  | mW                        |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient            | 200  | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case               | 83.3 | $^\circ\text{C}/\text{W}$ |

**Note:**

1. 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<sup>(2)</sup>**

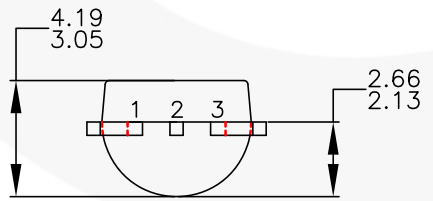
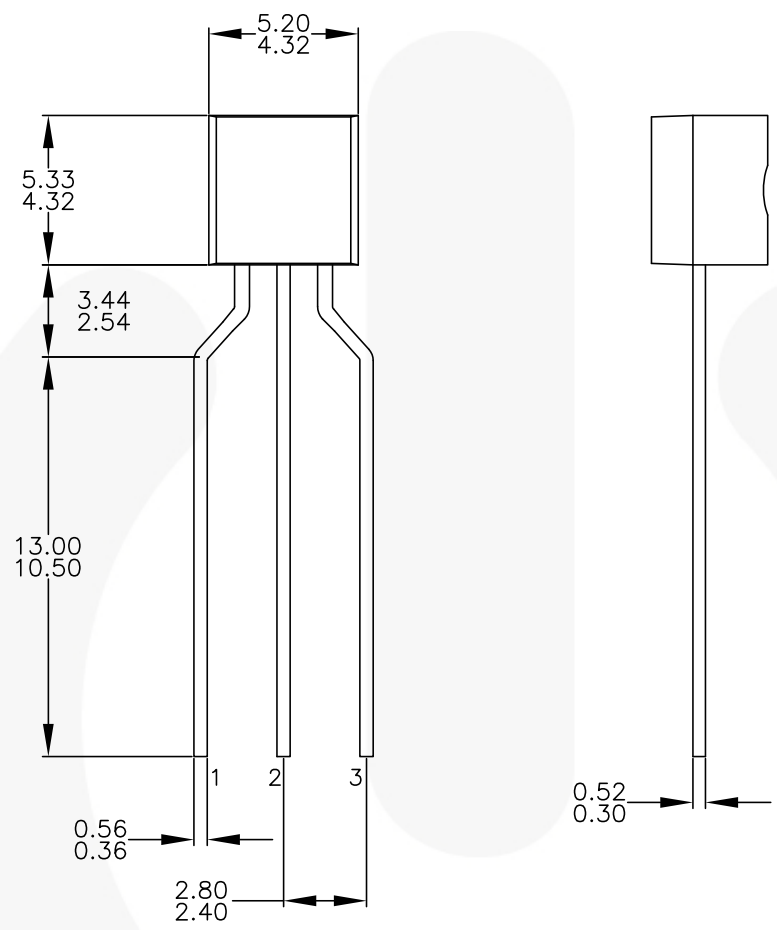
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol        | Parameter                                       | Conditions   | Min.   | Typ. | Max. | Unit |
|---------------|---|--|--------|------|------|------|
| $V_{CEO}$     | Collector-Emitter Breakdown Voltage             | $I_C = -2\text{ mA}, I_B = 0$  | -30    |      |      | V    |
| $V_{CBO}$     | Collector-Base Breakdown Voltage                | $I_C = -100\ \mu\text{A}, I_E = 0$                                   | -40    |      |      | V    |
| $V_{EBO}$     | Emitter-Base Breakdown Voltage                  | $I_E = -10\ \mu\text{A}, I_C = 0$                                    | -10    |      |      | V    |
| $I_{CBO}$     | Collector Cut-Off Current                       | $V_{CB} = -30\text{ V}, I_E = 0$                                     |        |      | -100 | nA   |
| $h_{FE}$      | DC Current Gain                                 | $I_C = -20\text{ mA}, V_{CE} = -2\text{ V}$                          | 30,000 |      |      |      |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage            | $I_C = -100\text{ mA}, I_B = -0.1\text{ mA}$                         |        |      | -1   | V    |
| $V_{BE(on)}$  | Base-Emitter On Voltage                         | $I_C = -10\text{ mA}, V_{CE} = -5\text{ V}$                          |        |      | -1.4 | V    |
| $f_T$         | Current Gain - Bandwidth Product <sup>(3)</sup> | $I_C = -10\text{ mA}, V_{CE} = -5\text{ V},$<br>$f = 100\text{ MHz}$ |        | 200  |      | MHz  |

**Notes:**

- Pulse test: pulse width  $\leq 2.0\%$
- $f_T = |h_{fe}| \cdot f_{test}$

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.
  - E. FAIRCHILD SEMICONDUCTOR.

Figure 1. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form





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