

# PNP Darlington Transistor

## BC516

### Features

- This Device is Designed for Applications Requiring Extremely High Current Gain at Currents to 1 A.
- This is a Pb-Free Device

### ABSOLUTE MAXIMUM RATINGS

(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                |
| $T_J, T_{STG}$ | Junction and Storage Junction Temperature Range | –55 to +150 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS (Note1)

(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 | $^\circ\text{C}/\text{W}$ |

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.

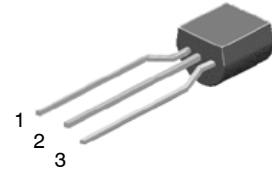
### ELECTRICAL CHARACTERISTICS (Note 2)

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    |
| $V_{CBO}$     | Emitter–Base Breakdown Voltage            | $I_C = -100\text{ }\mu\text{A}, I_E = 0$                        | –40    | –    | –    | V    |
| $V_{EBO}$     | Emitter–Base Breakdown Voltage            | $I_E = -10\text{ }\mu\text{A}, I_C = 0$                         | –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 (Note 3) | $I_C = -10\text{ mA}, V_{CE} = -5\text{ V}, f = 100\text{ MHz}$ | –      | 200  | –    | MHz  |

2. Pulse Test: Pulse Width  $\leq 0.2\%$ .

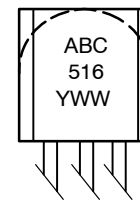
3.  $f_T = |h_{fe}| \cdot f_{test}$



1. Collector
2. Base
3. Emitter

TO–92–3  
CASE 135AR

### MARKING DIAGRAM



- A = Assembly Location  
BC516 = Specific Device Code  
Y = Year  
WW = Work Week

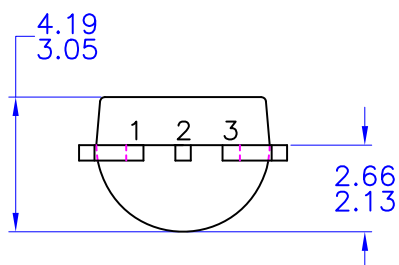
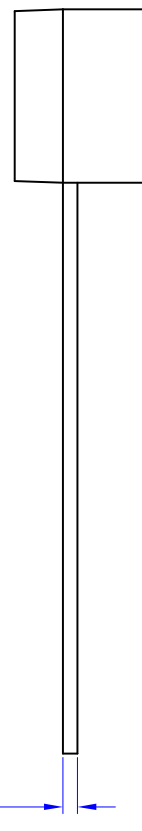
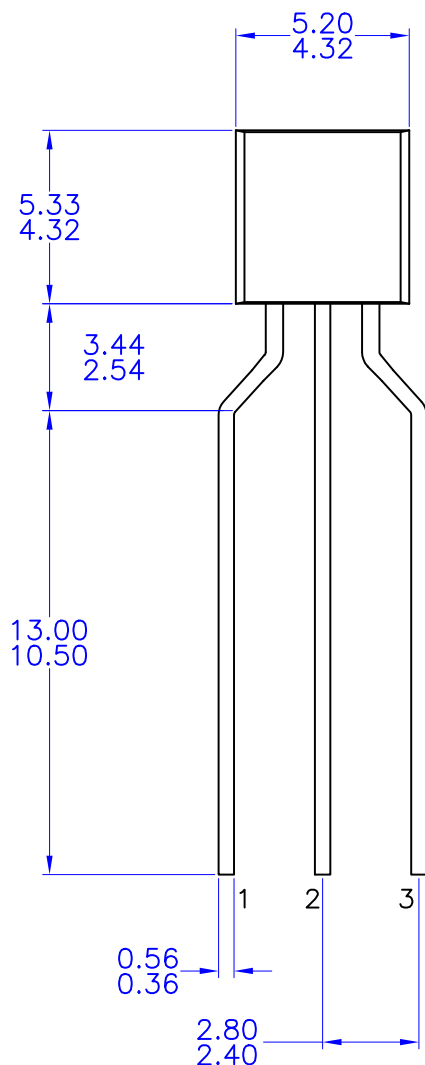
### ORDERING INFORMATION

| Device     | Package  | Shipping†          |
|------------|----------|--------------------|
| BC516–D27Z | TO–92 3L | 2000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](http://BRD8011/D).

**TO-92 3 4.83x4.76 LEADFORMED**  
CASE 135AR  
ISSUE O

DATE 30 SEP 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-1994

|                         |                                     |                                                                                                                                                                                     |
|-------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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