

# BC327, BC327-16, BC327-25, BC327-40

## Amplifier Transistors

### PNP Silicon

#### Features

- These are Pb-Free Devices\*

#### MAXIMUM RATINGS

| Rating  | Symbol         | Value       | Unit                       |
|---|----------------|-------------|----------------------------|
| Collector-Emitter Voltage   | $V_{CEO}$      | -45         | Vdc                        |
| Collector-Emitter Voltage   | $V_{CES}$      | -50         | Vdc                        |
| Emitter-Base Voltage  | $V_{EBO}$      | -5.0        | Vdc                        |
| Collector Current - Continuous  | $I_C$          | -800        | mAdc                       |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $T_A = 25^\circ\text{C}$ | $P_D$          | 625<br>5.0  | mW<br>mW/ $^\circ\text{C}$ |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $T_A = 25^\circ\text{C}$ | $P_D$          | 1.5<br>12   | W<br>mW/ $^\circ\text{C}$  |
| Operating and Storage Junction<br>Temperature Range   | $T_J, T_{stg}$ | -55 to +150 | $^\circ\text{C}$           |

#### THERMAL CHARACTERISTICS

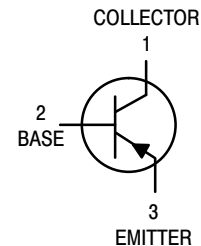
| Characteristic                          | Symbol          | Max  | Unit                      |
|---|-----------------|------|---------------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 200  | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Case    | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

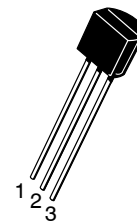


ON Semiconductor®

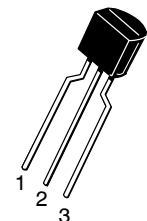
<http://onsemi.com>



TO-92  
CASE 29  
STYLE 17

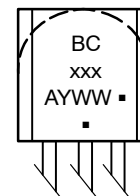


STRAIGHT LEAD  
BULK PACK



BENT LEAD  
TAPE & REEL  
AMMO PACK

#### MARKING DIAGRAM



BCxxx = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

See detailed ordering, marking, and shipping information in the package dimensions section on page 4 of this data sheet.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# BC327, BC327-16, BC327-25, BC327-40

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

| Characteristic   | Symbol               | Min  | Typ | Max  | Unit |
|--|----------------------|------|-----|------|------|
| <b>OFF CHARACTERISTICS</b>   |                      |      |     |      |      |
| Collector-Emitter Breakdown Voltage<br>(I <sub>C</sub> = -10 mA, I <sub>B</sub> = 0)               | V <sub>(BR)CEO</sub> | -45  | -   | -    | Vdc  |
| Collector-Emitter Breakdown Voltage<br>(I <sub>C</sub> = -100 μA, I <sub>E</sub> = 0)              | V <sub>(BR)CES</sub> | -50  | -   | -    | Vdc  |
| Emitter-Base Breakdown Voltage<br>(I <sub>E</sub> = -10 μA, I <sub>C</sub> = 0)                    | V <sub>(BR)EBO</sub> | -5.0 | -   | -    | Vdc  |
| Collector Cutoff Current<br>(V <sub>CB</sub> = -30 V, I <sub>E</sub> = 0)                          | I <sub>CBO</sub>     | -    | -   | -100 | nAdc |
| Collector Cutoff Current<br>(V <sub>CE</sub> = -45 V, V <sub>BE</sub> = 0)                         | I <sub>CES</sub>     | -    | -   | -100 | nAdc |
| Emitter Cutoff Current<br>(V <sub>EB</sub> = -4.0 V, I <sub>C</sub> = 0)                           | I <sub>EBO</sub>     | -    | -   | -100 | nAdc |
| <b>ON CHARACTERISTICS</b>  |                      |      |     |      |      |
| DC Current Gain<br>(I <sub>C</sub> = -100 mA, V <sub>CE</sub> = -1.0 V)                            | h <sub>FE</sub>      | 100  | -   | 630  | -    |
|  |                      | 100  | -   | 250  |      |
|  |                      | 160  | -   | 400  |      |
|  |                      | 250  | -   | 630  |      |
|  |                      | 40   | -   | -    |      |
| Base-Emitter On Voltage<br>(I <sub>C</sub> = -300 mA, V <sub>CE</sub> = -1.0 V)                    | V <sub>BE(on)</sub>  | -    | -   | -1.2 | Vdc  |
| Collector-Emitter Saturation Voltage<br>(I <sub>C</sub> = -500 mA, I <sub>B</sub> = -50 mA)        | V <sub>CE(sat)</sub> | -    | -   | -0.7 | Vdc  |
| <b>SMALL-SIGNAL CHARACTERISTICS</b>  |                      |      |     |      |      |
| Output Capacitance<br>(V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1.0 MHz)                   | C <sub>ob</sub>      | -    | 11  | -    | pF   |
| Current-Gain-Bandwidth Product<br>(I <sub>C</sub> = -10 mA, V <sub>CE</sub> = -5.0 V, f = 100 MHz) | f <sub>T</sub>       | -    | 260 | -    | MHz  |

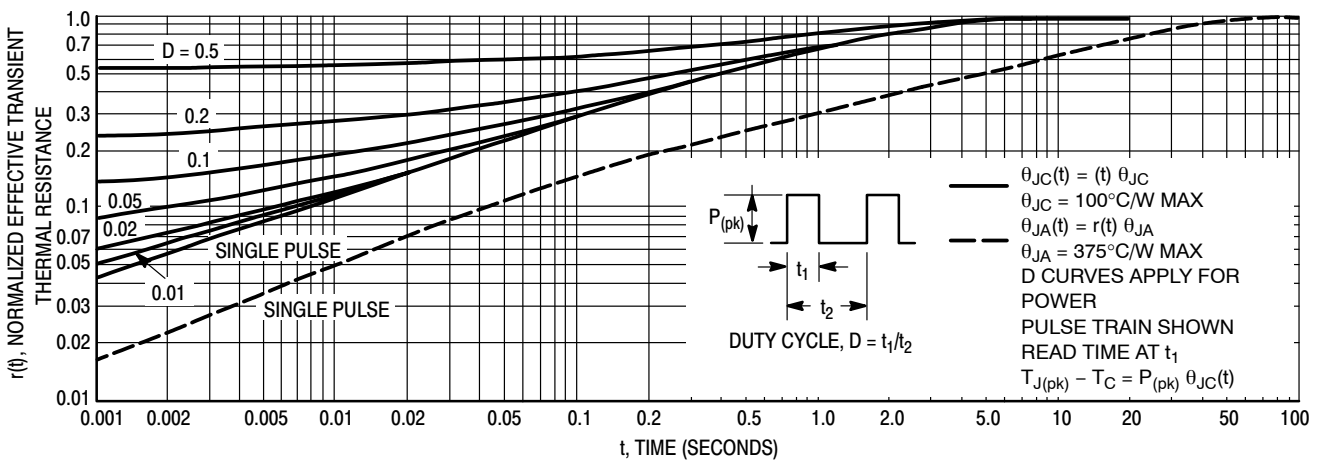


Figure 1. Thermal Response

BC327, BC327-16, BC327-25, BC327-40

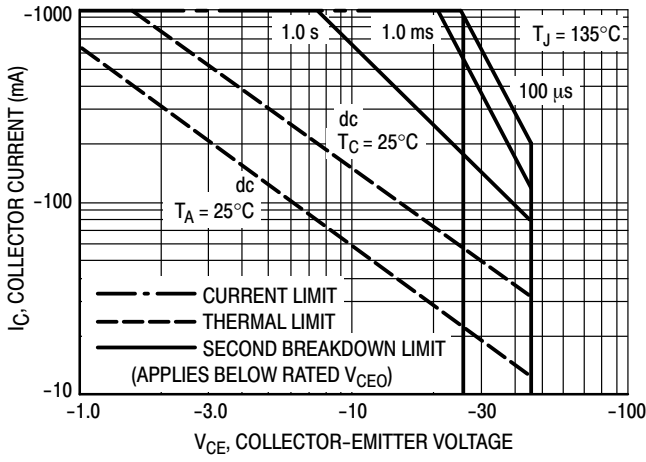


Figure 2. Active Region - Safe Operating Area

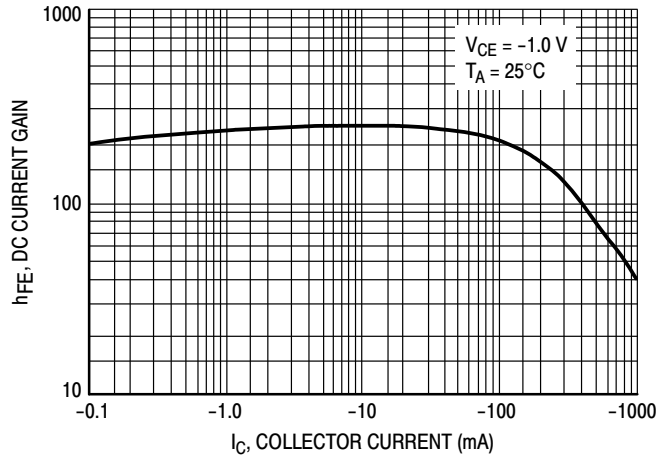


Figure 3. DC Current Gain

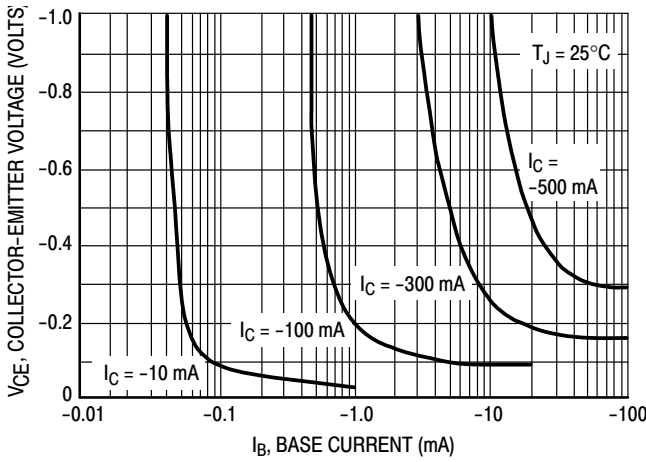


Figure 4. Saturation Region

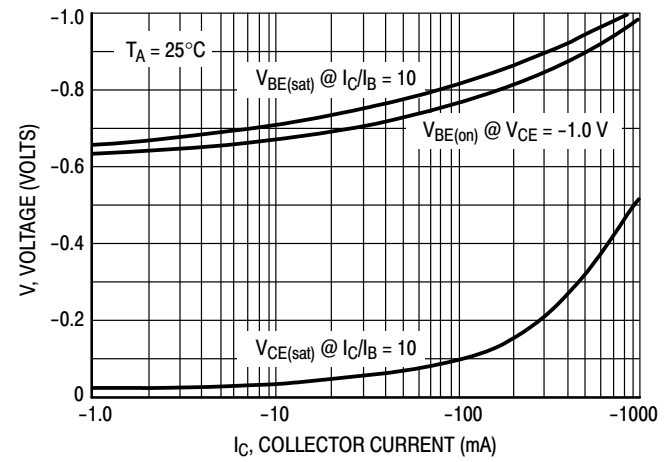


Figure 5. "On" Voltages

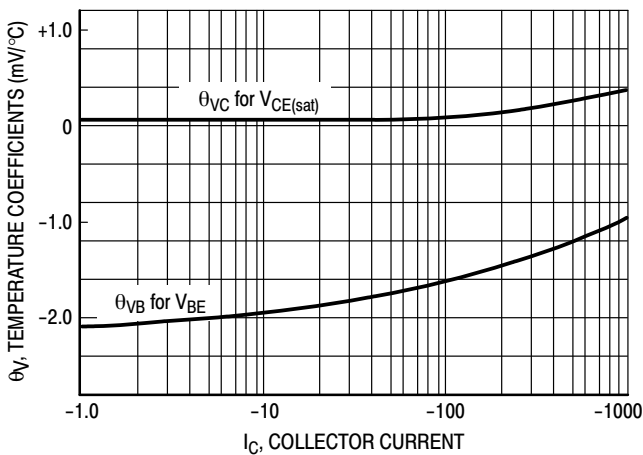


Figure 6. Temperature Coefficients

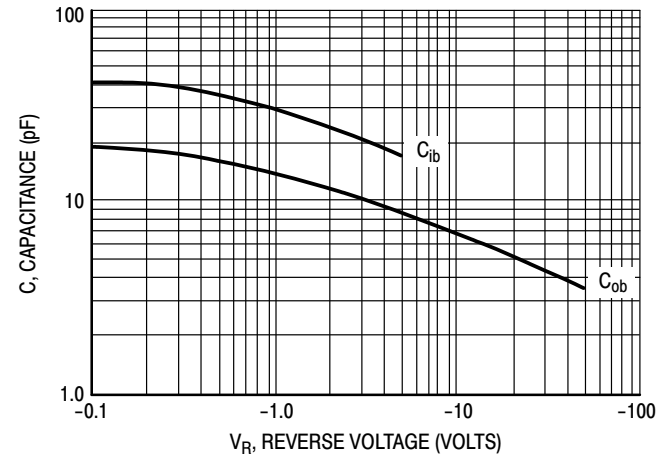


Figure 7. Capacitances

## BC327, BC327-16, BC327-25, BC327-40

### ORDERING INFORMATION

| Device Order Number | Specific Device Marking | Package Type                     | Shipping†              |
|---------------------|-------------------------|----------------------------------|------------------------|
| BC327G              | 7                       | TO-92 Straight Lead<br>(Pb-Free) | 5000 Units / Bulk      |
| BC327RL1G           | 327                     | TO-92 Bent Lead<br>(Pb-Free)     | 2000 / Tape & Reel     |
| BC327-025G          | 327                     | TO-92 Straight Lead<br>(Pb-Free) | 5000 Units / Bulk      |
| BC327-25RL1G        | 7-25                    | TO-92 Bent Lead<br>(Pb-Free)     | 2000 / Tape & Reel     |
| BC327-25ZL1G        | 32725                   | TO-92 Bent Lead<br>(Pb-Free)     | 2000 / Tape & Ammo Box |
| BC327-40ZL1G        | 7-40                    | TO-92 Bent Lead<br>(Pb-Free)     | 2000 / Tape & Ammo Box |

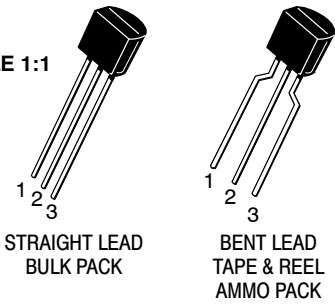
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

ON Semiconductor®

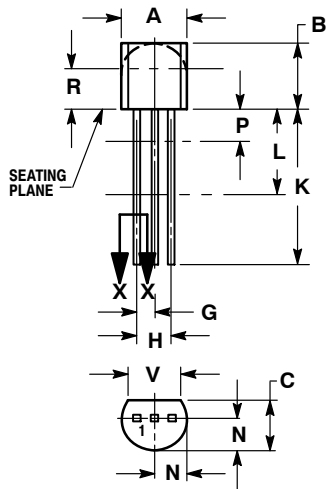


SCALE 1:1

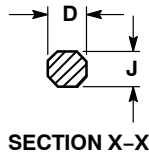


TO-92 (TO-226)  
CASE 29-11  
ISSUE AM

DATE 09 MAR 2007



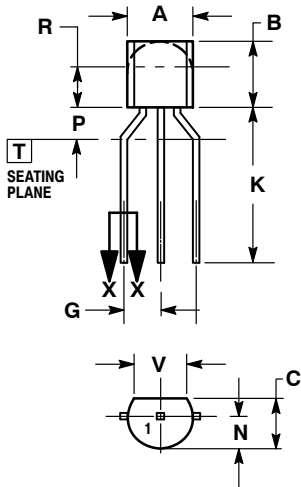
STRAIGHT LEAD  
BULK PACK



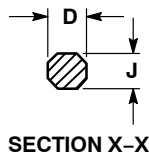
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.175  | 0.205 | 4.45        | 5.20  |
| B   | 0.170  | 0.210 | 4.32        | 5.33  |
| C   | 0.125  | 0.165 | 3.18        | 4.19  |
| D   | 0.016  | 0.021 | 0.407       | 0.533 |
| G   | 0.045  | 0.055 | 1.15        | 1.39  |
| H   | 0.095  | 0.105 | 2.42        | 2.66  |
| J   | 0.015  | 0.020 | 0.39        | 0.50  |
| K   | 0.500  | ---   | 12.70       | ---   |
| L   | 0.250  | ---   | 6.35        | ---   |
| N   | 0.080  | 0.105 | 2.04        | 2.66  |
| P   | ---    | 0.100 | ---         | 2.54  |
| R   | 0.115  | ---   | 2.93        | ---   |
| V   | 0.135  | ---   | 3.43        | ---   |



BENT LEAD  
TAPE & REEL  
AMMO PACK



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 4.45        | 5.20 |
| B   | 4.32        | 5.33 |
| C   | 3.18        | 4.19 |
| D   | 0.40        | 0.54 |
| G   | 2.40        | 2.80 |
| J   | 0.39        | 0.50 |
| K   | 12.70       | ---  |
| N   | 2.04        | 2.66 |
| P   | 1.50        | 4.00 |
| R   | 2.93        | ---  |
| V   | 3.43        | ---  |

STYLES ON PAGE 2

|                  |                           |  |
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**TO-92 (TO-226)**  
**CASE 29-11**  
**ISSUE AM**

DATE 09 MAR 2007

STYLE 1:  
 PIN 1. EMITTER  
 2. BASE  
 3. COLLECTOR

STYLE 2:  
 PIN 1. BASE  
 2. EMITTER  
 3. COLLECTOR

STYLE 3:  
 PIN 1. ANODE  
 2. ANODE  
 3. CATHODE

STYLE 4:  
 PIN 1. CATHODE  
 2. CATHODE  
 3. ANODE

STYLE 5:  
 PIN 1. DRAIN  
 2. SOURCE  
 3. GATE

STYLE 6:  
 PIN 1. GATE  
 2. SOURCE & SUBSTRATE  
 3. DRAIN

STYLE 7:  
 PIN 1. SOURCE  
 2. DRAIN  
 3. GATE

STYLE 8:  
 PIN 1. DRAIN  
 2. GATE  
 3. SOURCE & SUBSTRATE

STYLE 9:  
 PIN 1. BASE 1  
 2. EMITTER  
 3. BASE 2

STYLE 10:  
 PIN 1. CATHODE  
 2. GATE  
 3. ANODE

STYLE 11:  
 PIN 1. ANODE  
 2. CATHODE & ANODE  
 3. CATHODE

STYLE 12:  
 PIN 1. MAIN TERMINAL 1  
 2. GATE  
 3. MAIN TERMINAL 2

STYLE 13:  
 PIN 1. ANODE 1  
 2. GATE  
 3. CATHODE 2

STYLE 14:  
 PIN 1. EMITTER  
 2. COLLECTOR  
 3. BASE

STYLE 15:  
 PIN 1. ANODE 1  
 2. CATHODE  
 3. ANODE 2

STYLE 16:  
 PIN 1. ANODE  
 2. GATE  
 3. CATHODE

STYLE 17:  
 PIN 1. COLLECTOR  
 2. BASE  
 3. EMITTER

STYLE 18:  
 PIN 1. ANODE  
 2. CATHODE  
 3. NOT CONNECTED

STYLE 19:  
 PIN 1. GATE  
 2. ANODE  
 3. CATHODE

STYLE 20:  
 PIN 1. NOT CONNECTED  
 2. CATHODE  
 3. ANODE

STYLE 21:  
 PIN 1. COLLECTOR  
 2. EMITTER  
 3. BASE

STYLE 22:  
 PIN 1. SOURCE  
 2. GATE  
 3. DRAIN

STYLE 23:  
 PIN 1. GATE  
 2. SOURCE  
 3. DRAIN

STYLE 24:  
 PIN 1. EMITTER  
 2. COLLECTOR/ANODE  
 3. CATHODE

STYLE 25:  
 PIN 1. MT 1  
 2. GATE  
 3. MT 2

STYLE 26:  
 PIN 1. V<sub>CC</sub>  
 2. GROUND 2  
 3. OUTPUT

STYLE 27:  
 PIN 1. MT  
 2. SUBSTRATE  
 3. MT

STYLE 28:  
 PIN 1. CATHODE  
 2. ANODE  
 3. GATE

STYLE 29:  
 PIN 1. NOT CONNECTED  
 2. ANODE  
 3. CATHODE

STYLE 30:  
 PIN 1. DRAIN  
 2. GATE  
 3. SOURCE

STYLE 31:  
 PIN 1. GATE  
 2. DRAIN  
 3. SOURCE

STYLE 32:  
 PIN 1. BASE  
 2. COLLECTOR  
 3. EMITTER

STYLE 33:  
 PIN 1. RETURN  
 2. INPUT  
 3. OUTPUT

STYLE 34:  
 PIN 1. INPUT  
 2. GROUND  
 3. LOGIC

STYLE 35:  
 PIN 1. GATE  
 2. COLLECTOR  
 3. EMITTER

|                         |                                  |  |
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| <b>DESCRIPTION:</b>     | <b>TO-92 (TO-226)</b>            | <b>PAGE 2 OF 3</b>   |



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