

# BC212B

## Amplifier Transistors

### PNP Silicon

#### Features

- These are Pb-Free Devices\*

#### MAXIMUM RATINGS

| Rating   | Symbol         | Value       | Unit                       |
|--|----------------|-------------|----------------------------|
| Collector-Emitter Voltage  | $V_{CEO}$      | -50         | Vdc                        |
| Collector-Base Voltage   | $V_{CBO}$      | -60         | Vdc                        |
| Emitter-Base Voltage   | $V_{EBO}$      | -5.0        | Vdc                        |
| Collector Current – Continuous   | $I_C$          | -100        | mA dc                      |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 350<br>2.8  | mW<br>mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.0<br>8.0  | 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

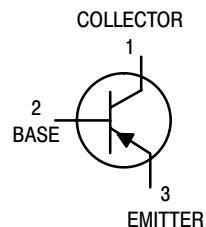
| Characteristic                          | Symbol          | Max | Unit               |
|---|-----------------|-----|--------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 357 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case    | $R_{\theta JC}$ | 125 | $^\circ\text{C/W}$ |

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.

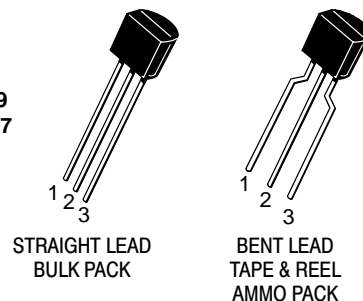


ON Semiconductor®

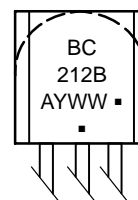
<http://onsemi.com>



TO-92  
CASE 29  
STYLE 17



#### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device     | Package            | Shipping†          |
|------------|--------------------|--------------------|
| BC212BG    | TO-92<br>(Pb-Free) | 5000 Units / Bulk  |
| BC212BRL1G | TO-92<br>(Pb-Free) | 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.

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

# BC212B

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic                      | Symbol        | Min | Typ | Max | Unit |
|-------------------------------------|---------------|-----|-----|-----|------|
| Collector–Emitter Breakdown Voltage | $V_{(BR)CEO}$ | –50 | –   | –   | Vdc  |
| Collector–Base Breakdown Voltage    | $V_{(BR)CBO}$ | –60 | –   | –   | Vdc  |
| Emitter–Base Breakdown Voltage      | $V_{(BR)EBO}$ | –5  | –   | –   | Vdc  |
| Collector–Emitter Leakage Current   | $I_{CBO}$     | –   | –   | –15 | nAdc |
| Emitter–Base Leakage Current        | $I_{EBO}$     | –   | –   | –15 | nAdc |

## ON CHARACTERISTICS

|  |               |               |                |             |     |
|--|---------------|---------------|----------------|-------------|-----|
| DC Current Gain<br>( $I_C = -10\ \mu\text{Adc}$ , $V_{CE} = -5.0\ \text{Vdc}$ )<br><br>( $I_C = -2.0\ \text{mAdc}$ , $V_{CE} = -5.0\ \text{Vdc}$ )<br><br>( $I_C = -100\ \text{mAdc}$ , $V_{CE} = -5.0\ \text{Vdc}$ ) (Note 1) | $h_{FE}$      | 40<br>60<br>– | –<br>–<br>120  | –<br>–<br>– | –   |
| Collector–Emitter Saturation Voltage<br>( $I_C = -10\ \text{mAdc}$ , $I_B = -0.5\ \text{mAdc}$ )<br>( $I_C = -100\ \text{mAdc}$ , $I_B = -5.0\ \text{mAdc}$ ) (Note 1)   | $V_{CE(sat)}$ | –<br>–        | –0.10<br>–0.25 | –<br>–0.6   | Vdc |
| Base–Emitter Saturation Voltage<br>( $I_C = -100\ \text{mAdc}$ , $I_B = -5.0\ \text{mAdc}$ )   | $V_{BE(sat)}$ | –             | –1.0           | –1.4        | Vdc |
| Base–Emitter On Voltage<br>( $I_C = -2.0\ \text{mAdc}$ , $V_{CE} = -5.0\ \text{Vdc}$ )   | $V_{BE(on)}$  | –0.6          | –0.62          | –0.72       | Vdc |

## DYNAMIC CHARACTERISTICS

|  |          |     |     |     |     |
|--|----------|-----|-----|-----|-----|
| Current–Gain – Bandwidth Product<br>( $I_C = -10\ \text{mAdc}$ , $V_{CE} = -5.0\ \text{Vdc}$ , $f = 100\ \text{mHz}$ )                                   | $f_T$    | –   | 280 | –   | MHz |
| Common–Base Output Capacitance<br>( $V_{CB} = -10\ \text{Vdc}$ , $I_C = 0$ , $f = 1.0\ \text{mHz}$ )   | $C_{ob}$ | –   | –   | 6.0 | pF  |
| Noise Figure<br>( $I_C = -0.2\ \text{mAdc}$ , $V_{CE} = -5.0\ \text{Vdc}$ , $R_S = 2.0\ \text{k}\Omega$ , $f = 1.0\ \text{kHz}$ , $f = 200\ \text{Hz}$ ) | NF       | –   | –   | 10  | dB  |
| Small–Signal Current Gain<br>( $I_C = -2.0\ \text{mAdc}$ , $V_{CE} = -5.0\ \text{Vdc}$ , $f = 1.0\ \text{kHz}$ )   | $h_{fe}$ | 200 | –   | 400 | –   |

1. Pulse Test:  $T_p$  300 s, Duty Cycle 2.0%.

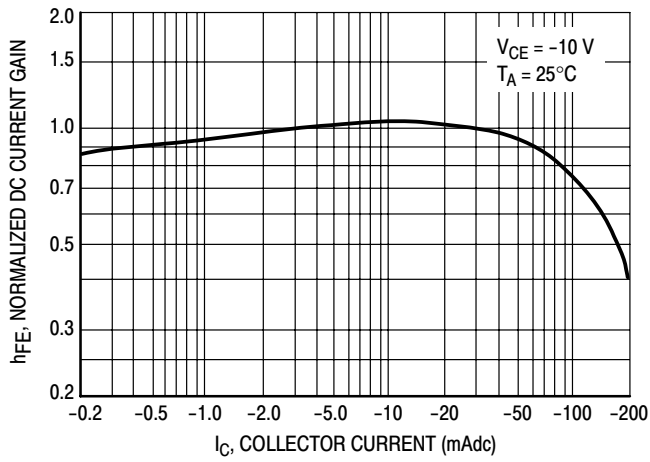


Figure 1. Normalized DC Current Gain

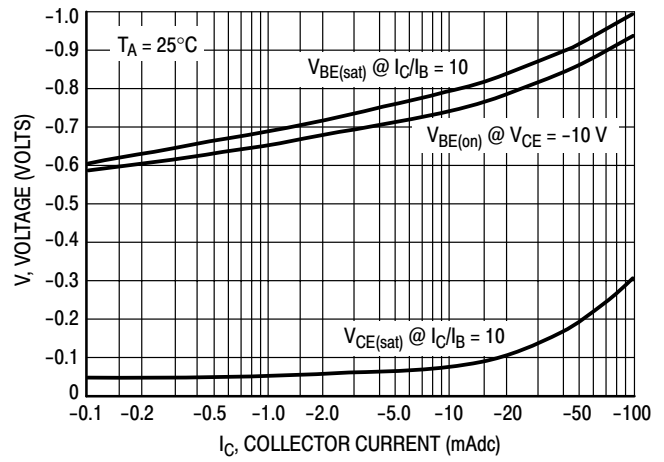


Figure 2. "Saturation" and "On" Voltages

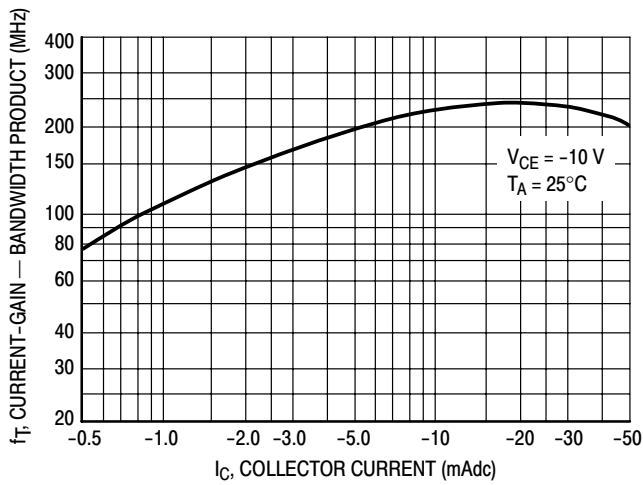


Figure 3. Current-Gain - Bandwidth Product

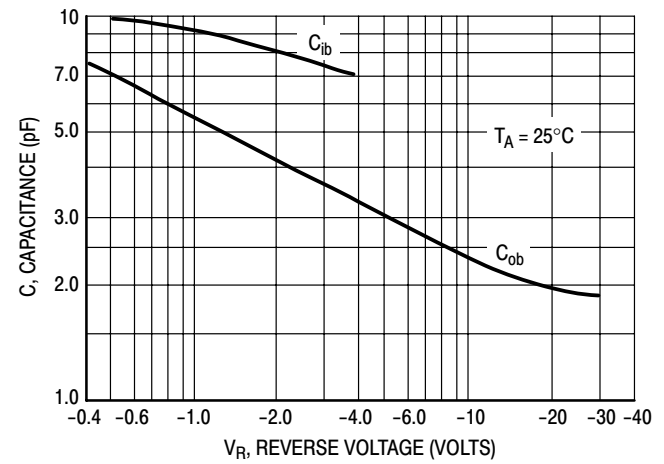


Figure 4. Capacitances

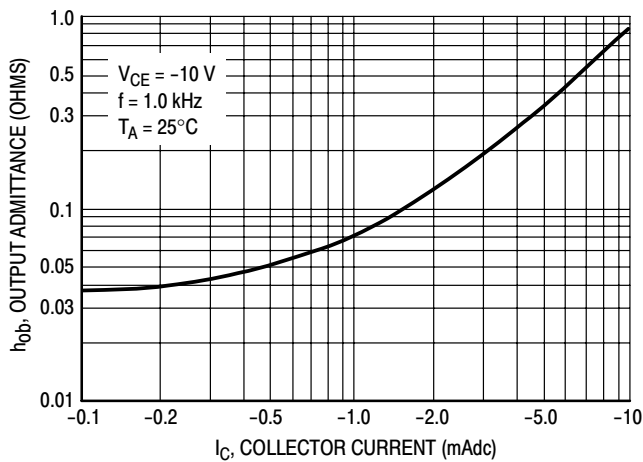


Figure 5. Output Admittance

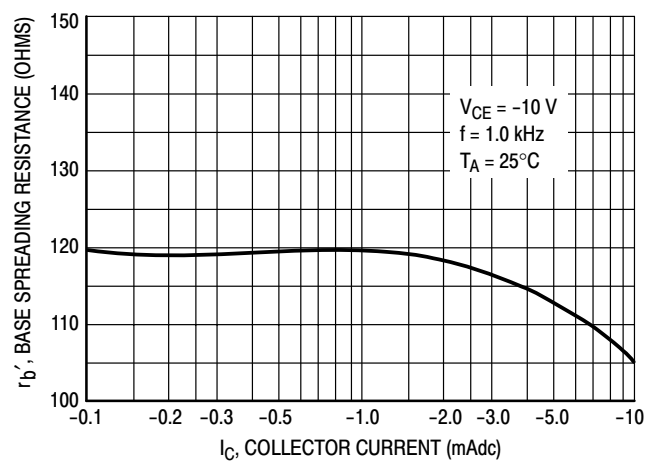
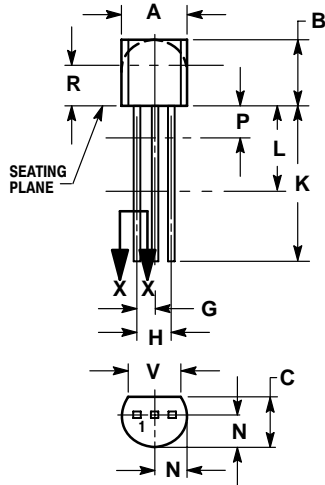


Figure 6. Base Spreading Resistance

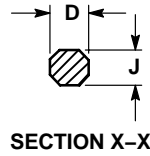
# BC212B

## PACKAGE DIMENSIONS

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



STRAIGHT LEAD  
BULK PACK

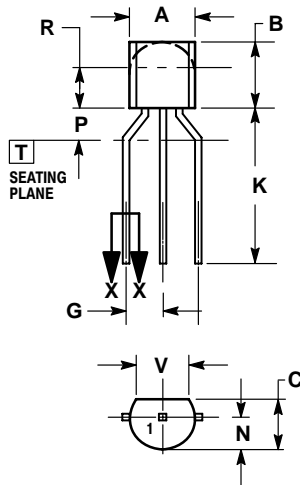


SECTION X-X

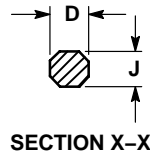
### NOTES:

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



SECTION X-X


### 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        | ---  |

### STYLE 17:

1. COLLECTOR
2. BASE
3. EMITTER

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