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## Is Now



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# BC560C

## Low Noise Transistors

### PNP Silicon

#### Features

- These are Pb-Free Devices\*

#### MAXIMUM RATINGS

| Rating                                                                                      | Symbol         | Value       | Unit                       |
|---------------------------------------------------------------------------------------------|----------------|-------------|----------------------------|
| Collector – Emitter Voltage                                                                 | $V_{CEO}$      | –45         | Vdc                        |
| Collector – Base Voltage                                                                    | $V_{CBO}$      | –50         | Vdc                        |
| Emitter – Base Voltage                                                                      | $V_{EBO}$      | –5.0        | Vdc                        |
| Collector Current – Continuous                                                              | $I_C$          | –100        | mA dc                      |
| 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

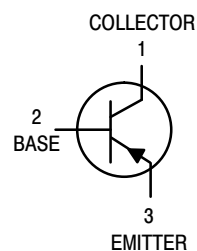
| Characteristic                          | Symbol          | Max  | Unit               |
|-----------------------------------------|-----------------|------|--------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 200  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case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

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.

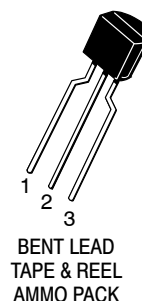
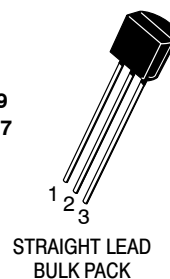


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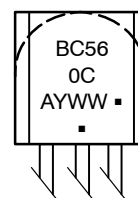
<http://onsemi.com>



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          |
|------------|--------------------|-------------------|
| BC560CG    | TO-92<br>(Pb-Free) | 5000 Units / Bulk |
| BC560CZL1G | TO-92<br>(Pb-Free) | 2000 / Ammo Pack  |

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

# BC560C

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

| Characteristic                                                                                                                                                                                                                                                                             | Symbol           | Min             | Typ                     | Max                | Unit                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|-------------------------|--------------------|-------------------------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                                                                                                                                                                 |                  |                 |                         |                    |                         |
| Collector – Emitter Breakdown Voltage<br>( $I_C = -10\text{ mA}$ , $I_B = 0$ )                                                                                                                                                                                                             | $V_{(BR)CEO}$    | -45             | –                       | –                  | Vdc                     |
| Collector – Base Breakdown Voltage<br>( $I_C = -10\text{ }\mu\text{A}$ , $I_E = 0$ )                                                                                                                                                                                                       | $V_{(BR)CBO}$    | -50             | –                       | –                  | Vdc                     |
| Emitter – Base Breakdown Voltage<br>( $I_E = -10\text{ }\mu\text{A}$ , $I_C = 0$ )                                                                                                                                                                                                         | $V_{(BR)EBO}$    | -5.0            | –                       | –                  | Vdc                     |
| Collector Cutoff Current<br>( $V_{CB} = -30\text{ Vdc}$ , $I_E = 0$ )<br>( $V_{CB} = -30\text{ Vdc}$ , $I_E = 0$ , $T_A = +125^\circ\text{C}$ )                                                                                                                                            | $I_{CBO}$        | –<br>–          | –<br>–                  | -15<br>-5.0        | nAdc<br>$\mu\text{Adc}$ |
| Emitter Cutoff Current<br>( $V_{EB} = -4.0\text{ Vdc}$ , $I_C = 0$ )                                                                                                                                                                                                                       | $I_{EBO}$        | –               | –                       | -15                | nAdc                    |
| <b>ON CHARACTERISTICS</b>                                                                                                                                                                                                                                                                  |                  |                 |                         |                    |                         |
| DC Current Gain<br>( $I_C = -10\text{ }\mu\text{A}$ , $V_{CE} = -5.0\text{ Vdc}$ )<br>( $I_C = -2.0\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ )                                                                                                                                              | $h_{FE}$         | 100<br>380      | 270<br>500              | –<br>800           | –                       |
| Collector – Emitter Saturation Voltage<br>( $I_C = -10\text{ mA}$ , $I_B = -0.5\text{ mA}$ )<br>( $I_C = -10\text{ mA}$ , $I_B =$ (Note 1))<br>( $I_C = -100\text{ mA}$ , $I_B = -5.0\text{ mA}$ , (Note 2))                                                                               | $V_{CE(sat)}$    | –<br>–<br>–     | -0.075<br>-0.3<br>-0.25 | -0.25<br>-0.6<br>– | Vdc                     |
| Base – Emitter Saturation Voltage<br>( $I_C = -100\text{ mA}$ , $I_B = -5.0\text{ mA}$ )                                                                                                                                                                                                   | $V_{BE(sat)}$    | –               | -1.1                    | –                  | Vdc                     |
| Base – Emitter On Voltage<br>( $I_C = -10\text{ }\mu\text{A}$ , $V_{CE} = -5.0\text{ Vdc}$ )<br>( $I_C = -100\text{ }\mu\text{A}$ , $V_{CE} = -5.0\text{ Vdc}$ )<br>( $I_C = -2.0\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ )                                                                | $V_{BE(on)}$     | –<br>–<br>-0.55 | -0.52<br>-0.55<br>-0.62 | –<br>–<br>-0.7     | Vdc                     |
| <b>SMALL-SIGNAL CHARACTERISTICS</b>                                                                                                                                                                                                                                                        |                  |                 |                         |                    |                         |
| Current – Gain – Bandwidth Product<br>( $I_C = -10\text{ mA}$ , $V_{CE} = -5.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )                                                                                                                                                                        | $f_T$            | –               | 250                     | –                  | MHz                     |
| Collector – Base Capacitance<br>( $V_{CB} = -10\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )                                                                                                                                                                                           | $C_{cbo}$        | –               | 2.5                     | –                  | pF                      |
| Small – Signal Current Gain<br>( $I_C = -2.0\text{ mA}$ , $V_{CE} = -5.0\text{ V}$ , $f = 1.0\text{ kHz}$ )                                                                                                                                                                                | $h_{fe}$         | 450             | 600                     | 900                | –                       |
| Noise Figure<br>( $I_C = -200\text{ }\mu\text{A}$ , $V_{CE} = -5.0\text{ Vdc}$ , $R_S = 2.0\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ )<br>( $I_C = -200\text{ }\mu\text{A}$ , $V_{CE} = -5.0\text{ Vdc}$ , $R_S = 100\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ , $\Delta f = 200\text{ kHz}$ ) | $NF_1$<br>$NF_2$ | –<br>–          | 0.5<br>–                | 2.0<br>10          | dB                      |

- $I_B$  is value for which  $I_C = -11\text{ mA}$  at  $V_{CE} = -1.0\text{ V}$ .
- Pulse test =  $300\text{ }\mu\text{s}$  – Duty cycle = 2%.

# BC560C

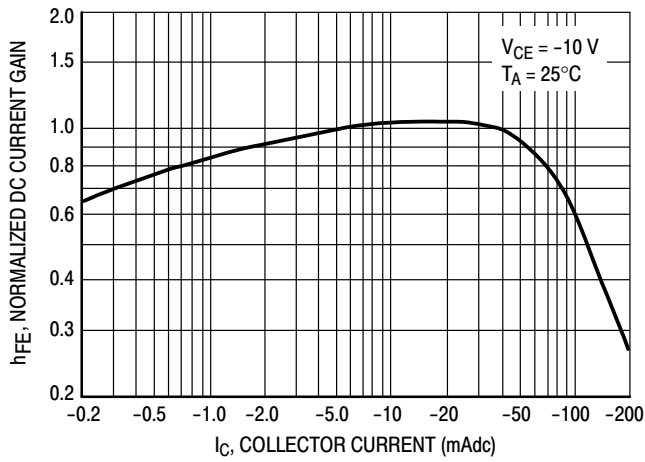


Figure 1. Normalized DC Current Gain

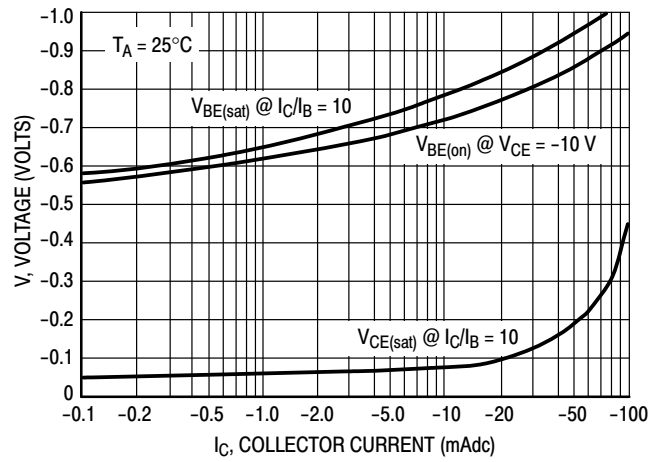


Figure 2. "Saturation" and "On" Voltages

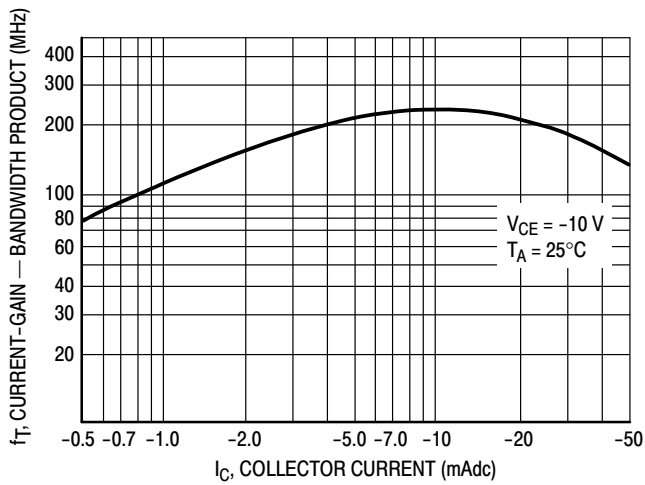


Figure 3. Current-Gain — Bandwidth Product

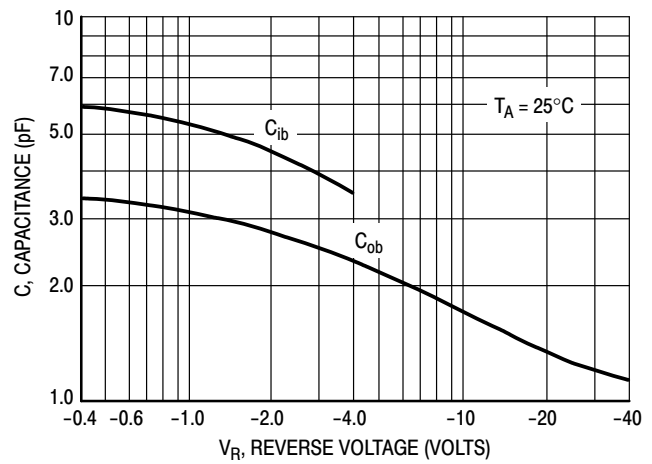


Figure 4. Capacitance

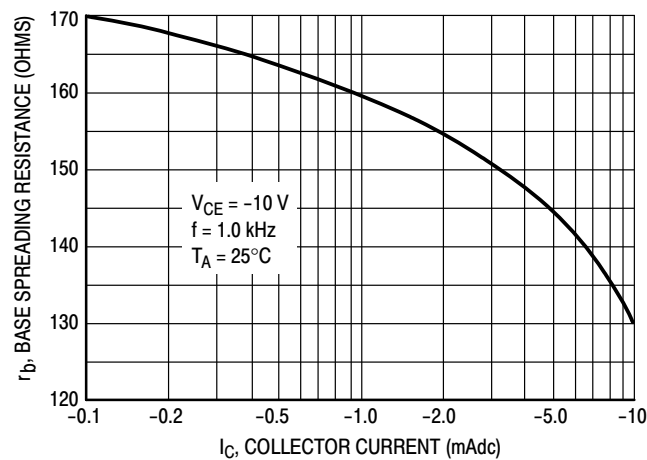
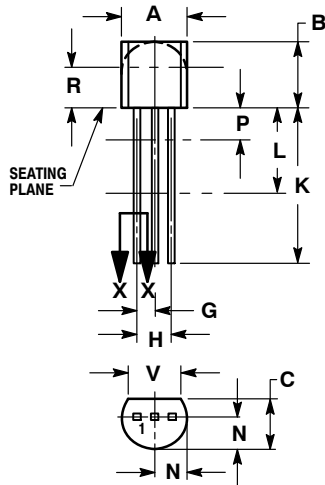


Figure 5. Base Spreading Resistance

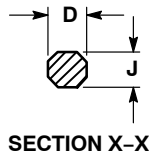
# BC560C

## PACKAGE DIMENSIONS

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



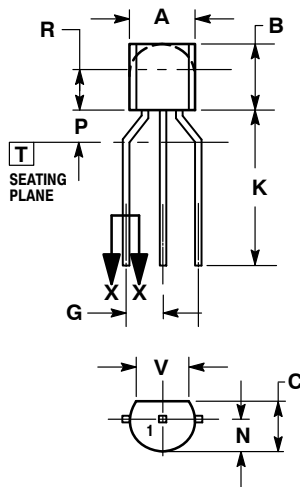
STRAIGHT LEAD  
BULK PACK



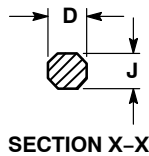
### NOTES:

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.
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| 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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