## BC556B, BC557A, B, C, BC558B

### Amplifier Transistors

PNP Silicon

**Features**
- Pb-Free Packages are Available*

### MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Rating</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Collector - Emitter Voltage</td>
<td>V_{CEO}</td>
<td>-65</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector - Base Voltage</td>
<td>V_{CBO}</td>
<td>-80</td>
<td>Vdc</td>
</tr>
<tr>
<td>Emitter - Base Voltage</td>
<td>V_{EBO}</td>
<td>-5.0</td>
<td>Vdc</td>
</tr>
<tr>
<td>Collector Current – Continuous</td>
<td>I_{C}</td>
<td>-100</td>
<td>mAdc</td>
</tr>
<tr>
<td>Collector Current – Peak</td>
<td>I_{CM}</td>
<td>-200</td>
<td>mAdc</td>
</tr>
<tr>
<td>Base Current – Peak</td>
<td>I_{BM}</td>
<td>-200</td>
<td>mAdc</td>
</tr>
<tr>
<td>Total Device Dissipation @ T_A = 25°C</td>
<td>P_D</td>
<td>625</td>
<td>mW</td>
</tr>
<tr>
<td>Total Device Dissipation @ T_C = 25°C</td>
<td>P_D</td>
<td>1.5</td>
<td>W</td>
</tr>
<tr>
<td>Operating and Storage Junction Temperature Range</td>
<td>T_J, T_{slag}</td>
<td>-55 to +150</td>
<td>°C</td>
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</tbody>
</table>

### THERMAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Resistance, Junction–to–Ambient</td>
<td>R_{UA}</td>
<td>200</td>
<td>°C/W</td>
</tr>
<tr>
<td>Thermal Resistance, Junction–to–Case</td>
<td>R_{UC}</td>
<td>83.3</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

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.

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

### Collector–Emitter Breakdown Voltage
- **Symbol**: \( V_{(BR)CEO} \)
- **Min**: –
- **Typ**: –
- **Max**: –
- **Unit**: V

### Collector–Base Breakdown Voltage
- **Symbol**: \( V_{(BR)CBO} \)
- **Min**: –
- **Typ**: –
- **Max**: –
- **Unit**: V

### Emitter–Base Breakdown Voltage
- **Symbol**: \( V_{(BR)EBO} \)
- **Min**: –
- **Typ**: –
- **Max**: –
- **Unit**: V

### Collector–Emitter Leakage Current
- **Symbol**: \( I_{CES} \)
- **Min**: –
- **Typ**: –
- **Max**: –
- **Unit**: nA

## ON CHARACTERISTICS

### DC Current Gain
- **Symbol**: \( h_{FE} \)
- **Min**: –
- **Typ**: 90
- **Max**: –
- **Unit**: –

### Collector–Emitter Saturation Voltage
- **Symbol**: \( V_{CE(sat)} \)
- **Min**: –
- **Typ**: –
- **Max**: –
- **Unit**: V

### Base–Emitter Saturation Voltage
- **Symbol**: \( V_{BE(sat)} \)
- **Min**: –
- **Typ**: –
- **Max**: –
- **Unit**: V

### Base–Emitter On Voltage
- **Symbol**: \( V_{BE(on)} \)
- **Min**: –
- **Typ**: –
- **Max**: –
- **Unit**: V

## SMALL–SIGNAL CHARACTERISTICS

### Current–Gain – Bandwidth Product
- **Symbol**: \( f_T \)
- **Min**: –
- **Typ**: 280
- **Max**: –
- **Unit**: MHz

### Output Capacitance
- **Symbol**: \( C_{ob} \)
- **Min**: 3.0
- **Typ**: 6.0
- **Max**: –
- **Unit**: pF

### Noise Figure
- **Symbol**: \( NF \)
- **Min**: 2.0
- **Typ**: 10
- **Max**: –
- **Unit**: dB

### Small–Signal Current Gain
- **Symbol**: \( h_{fe} \)
- **Min**: –
- **Typ**: 900
- **Max**: –
- **Unit**: –

1. \( I_C = -10 \) mA on the constant base current characteristics, which yields the point \( I_C = -11 \) mA, \( V_{CE} = -1.0 \) V.
Figure 1. Normalized DC Current Gain

Figure 2. “Saturation” and “On” Voltages

Figure 3. Collector Saturation Region

Figure 4. Base–Emitter Temperature Coefficient

Figure 5. Capacitances

Figure 6. Current–Gain – Bandwidth Product
Figure 7. DC Current Gain

Figure 8. “On” Voltage

Figure 9. Collector Saturation Region

Figure 10. Base–Emitter Temperature Coefficient

Figure 11. Capacitance

Figure 12. Current–Gain – Bandwidth Product
The safe operating area curves indicate $I_C$–$V_{CE}$ limits of the transistor that must be observed for reliable operation. Collector
load lines for specific circuits must fall below the limits indicated by
the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)} = 150^\circ C$; $T_C$ or $T_A$ is
variable depending upon conditions. Pulse curves are valid for
duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ C$. $T_{J(pk)}$ may be
calculated from the data in Figure 13. At high case or ambient
temperatures, thermal limitations will reduce the power than can
be handled to values less than the limitations imposed by second
breakdown.
## ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Device</th>
<th>Package</th>
<th>Shipping†</th>
</tr>
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<tbody>
<tr>
<td>BC556BG</td>
<td>TO−92 (Pb−Free)</td>
<td>5000 Units / Bulk</td>
</tr>
<tr>
<td>BC556BZL1G</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Ammo Box</td>
</tr>
<tr>
<td>BC557AZL1G</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Ammo Box</td>
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<td>BC557BG</td>
<td>TO−92 (Pb−Free)</td>
<td>5000 Units / Bulk</td>
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<tr>
<td>BC557BRL1</td>
<td>TO−92</td>
<td>2000 / Tape &amp; Reel</td>
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<tr>
<td>BC557BRL1G</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Tape &amp; Reel</td>
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<tr>
<td>BC557BZL1G</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Ammo Box</td>
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<td>BC557CG</td>
<td>TO−92 (Pb−Free)</td>
<td>5000 Units / Bulk</td>
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<tr>
<td>BC557CZL1G</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Ammo Box</td>
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<tr>
<td>BC558BRLG</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Tape &amp; Reel</td>
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<tr>
<td>BC558BRL1G</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Tape &amp; Reel</td>
</tr>
<tr>
<td>BC558BZL1G</td>
<td>TO−92 (Pb−Free)</td>
<td>2000 / Ammo Box</td>
</tr>
</tbody>
</table>

†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.
TO−92 (TO−226)  
CASE 29−11  
ISSUE AM  

STRAIGHT LEAD  
BULK PACK  

BENT LEAD  
TAPE & REEL  
AMMO PACK  

SECTION X−X  

NOTES:  
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.  

<table>
<thead>
<tr>
<th>DIM</th>
<th>MIN</th>
<th>MAX</th>
<th>MIN</th>
<th>MAX</th>
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<tbody>
<tr>
<td>A</td>
<td>0.175</td>
<td>0.205</td>
<td>4.45</td>
<td>5.20</td>
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<td>B</td>
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<td>0.210</td>
<td>4.32</td>
<td>5.33</td>
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<td>0.165</td>
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<tr>
<td>D</td>
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<td>0.021</td>
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<td>1.39</td>
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<tr>
<td>K</td>
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<td>12.70</td>
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<tr>
<td>L</td>
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<td>2.04</td>
<td>2.66</td>
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<td>P</td>
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<td>0.100</td>
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<tr>
<td>R</td>
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<tr>
<td>V</td>
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<td>3.43</td>
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</table>

STRAIGHT LEAD  
BULK PACK  

SECTION X−X  

NOTES:  
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<tr>
<td>A</td>
<td>4.45</td>
<td>5.20</td>
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<tr>
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BENT LEAD  
TAPE & REEL  
AMMO PACK  

SECTION X−X  

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