

BC556B, BC557, A, B, C, BC558B, C



Amplifier Transistors

PNP Silicon

ON Semiconductor

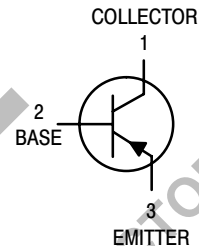
<http://onsemi.com>

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|-------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------------------|
| Collector-Emitter Voltage BC556 BC557 BC558 | V_{CEO} | -65 -45 -30 | Vdc |
| Collector-Base Voltage BC556 BC557 BC558 | V_{CBO} | -80 -50 -30 | Vdc |
| Emitter-Base Voltage | V_{EBO} | -5.0 | Vdc |
| Collector Current — Continuous — Peak | I_C I_{CM} | -100 -200 | mAdc |
| Base Current — Peak | I_{BM} | -200 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | Watts mW/ $^\circ\text{C}$ |
| Operating and Storage Junction 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 | $^\circ\text{C}/\text{W}$ |



CASE 29
TO-92
STYLE 17

ORDERING INFORMATION

| Device | Package | Shipping |
|----------------|---------|------------------|
| BC556B | TO-92 | 5000 Units/Box |
| BC556BRL1 | TO-92 | 2000/Tape & Reel |
| BC556BZL1 | TO-92 | 2000/Ammo Pack |
| BC557, A | TO-92 | 5000 Units/Box |
| BC557AZL1 | TO-92 | 2000/Ammo Pack |
| BC557B | TO-92 | 5000 Units/Box |
| BC557BRL1 | TO-92 | 2000/Tape & Reel |
| BC557BZL1 | TO-92 | 2000/Ammo Pack |
| BC557C | TO-92 | 5000 Units/Box |
| BC557ZL1, CZL1 | TO-92 | 2000/Ammo Pack |
| BC558B | TO-92 | 5000 Units/Box |
| BC558BRL, BRL1 | TO-92 | 2000/Tape & Reel |
| BC558BZL1 | TO-92 | 2000/Ammo Pack |
| BC558C | TO-92 | 5000 Units/Box |
| BC558CRL1 | TO-92 | 2000/Tape & Reel |
| BC558ZL1, CZL1 | TO-92 | 2000/Ammo Pack |

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------|----------------------------|-------------------------------------|----------------------------------------------|------------------|
| OFF CHARACTERISTICS | | | | | | |
| Collector – Emitter Breakdown Voltage (I _C = -2.0 mA, I _B = 0) | BC556 BC557 BC558 | V _{(BR)CEO} | -65 -45 -30 | — — — | — — — | V |
| Collector – Base Breakdown Voltage (I _C = -100 μA) | BC556 BC557 BC558 | V _{(BR)CBO} | -80 -50 -30 | — — — | — — — | V |
| Emitter – Base Breakdown Voltage (I _E = -100 μA, I _C = 0) | BC556 BC557 BC558 | V _{(BR)EBO} | -5.0 -5.0 -5.0 | — — — | — — — | V |
| Collector – Emitter Leakage Current (V _{CE} = -40 V) (V _{CE} = -20 V) (V _{CE} = -20 V, T _A = 125°C) | BC556 BC557 BC558 BC556 BC557 BC558 | I _{CES} | — — — — — — | -2.0 -2.0 -2.0 — — — | -100 -100 -100 -4.0 -4.0 -4.0 | nA μA |

OBSOLETE
 THIS DEVICE IS OBSOLETE
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 REPRESENTATIVE FOR INFORMATION

BC556B, BC557, A, B, C, BC558B, C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|--------|-------|------|
| ON CHARACTERISTICS | | | | | |
| DC Current Gain (I _C = -10 μAdc, V _{CE} = -5.0 V) | h _{FE} | — | 90 | — | — |
| | BC557A | — | 150 | — | — |
| | BC556B/557B/558B | — | 270 | — | — |
| | BC557C | — | — | — | — |
| (I _C = -2.0 mAdc, V _{CE} = -5.0 V) | BC556 | 120 | — | 500 | — |
| | BC557 | 120 | — | 800 | — |
| | BC558 | 120 | — | 800 | — |
| | BC557A | 120 | 170 | 220 | — |
| | BC556B/557B/558B | 180 | 290 | 460 | — |
| | BC557C/558C | 420 | 500 | 800 | — |
| (I _C = -100 mAdc, V _{CE} = -5.0 V) | BC557A | — | 120 | — | — |
| | BC556B/557B/558B | — | 180 | — | — |
| | BC557C | — | 300 | — | — |
| Collector–Emitter Saturation Voltage (I _C = -10 mAdc, I _B = -0.5 mAdc) | V _{CE(sat)} | — | -0.075 | -0.3 | V |
| (I _C = -10 mAdc, I _B = see Note 1) | | — | -0.3 | -0.6 | |
| (I _C = -100 mAdc, I _B = -5.0 mAdc) | | — | -0.25 | -0.65 | |
| Base–Emitter Saturation Voltage (I _C = -10 mAdc, I _B = -0.5 mAdc) | V _{BE(sat)} | — | -0.7 | — | V |
| (I _C = -100 mAdc, I _B = -5.0 mAdc) | | — | -1.0 | — | |
| Base–Emitter On Voltage (I _C = -2.0 mAdc, V _{CE} = -5.0 Vdc) | V _{BE(on)} | -0.55 | -0.62 | -0.7 | V |
| (I _C = -10 mAdc, V _{CE} = -5.0 Vdc) | | — | -0.7 | -0.82 | |
| SMALL–SIGNAL CHARACTERISTICS | | | | | |
| Current–Gain — Bandwidth Product (I _C = -10 mA, V _{CE} = -5.0 V, f = 100 MHz) | f _T | — | 280 | — | MHz |
| | BC556 | — | 320 | — | |
| | BC557 | — | 360 | — | |
| | BC558 | — | — | — | |
| Output Capacitance (V _{CB} = -10 V, I _C = 0, f = 1.0 MHz) | C _{ob} | — | 3.0 | 6.0 | pF |
| Noise Figure (I _C = -0.2 mAdc, V _{CE} = -5.0 V, R _S = 2.0 kΩ, f = 1.0 kHz, Δf = 200 Hz) | NF | — | 2.0 | 10 | dB |
| | BC556 | — | 2.0 | 10 | |
| | BC557 | — | 2.0 | 10 | |
| | BC558 | — | 2.0 | 10 | |
| Small–Signal Current Gain (I _C = -2.0 mAdc, V _{CE} = -5.0 V) | h _{fe} | 120 | — | 800 | — |
| | BC558ZL1 | 180 | — | 460 | — |
| | BC558B, RL, RL1, ZL1 | 420 | — | 800 | — |
| | BC558C, RL1, ZL1 | 125 | — | 900 | — |
| (I _C = -2.0 mAdc, V _{CE} = -5.0 V, f = 1.0 kHz) | BC558ZL1 | 240 | — | 500 | — |
| | BC558B, RL, RL1, ZL1 | 450 | — | 900 | — |
| | BC558C, RL1, ZL1 | — | — | — | — |

Note 1: I_C = -10 mAdc on the constant base current characteristics, which yields the point I_C = -11 mAdc, V_{CE} = -1.0 V.

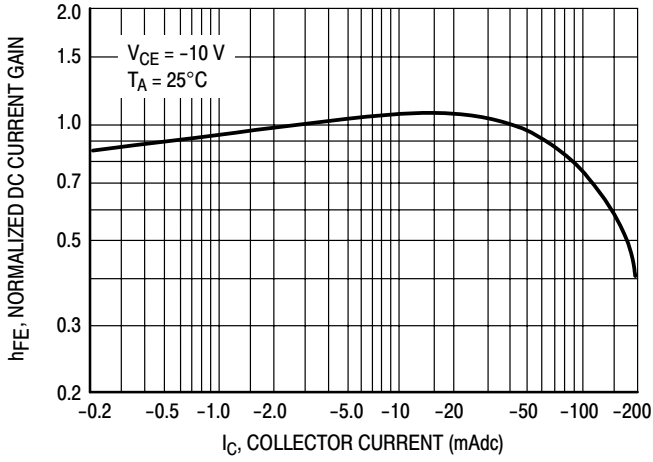


Figure 1. Normalized DC Current Gain

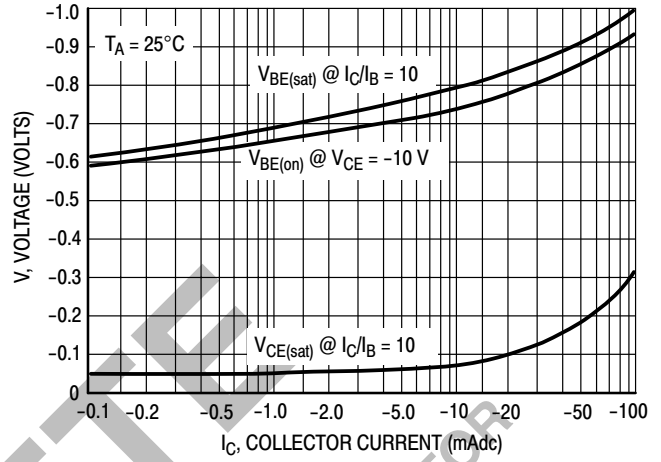


Figure 2. "Saturation" and "On" Voltages

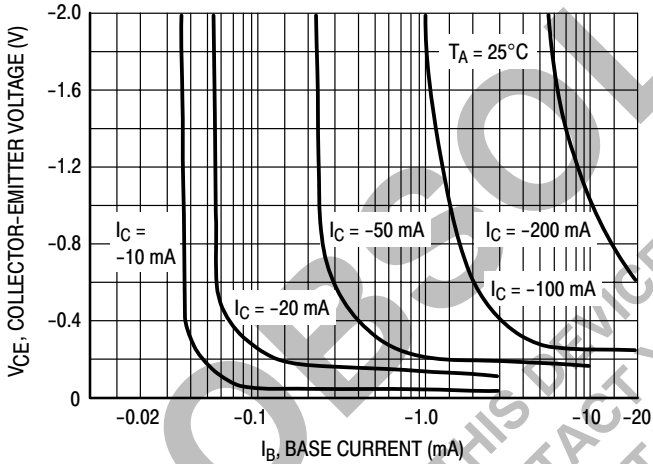


Figure 3. Collector Saturation Region

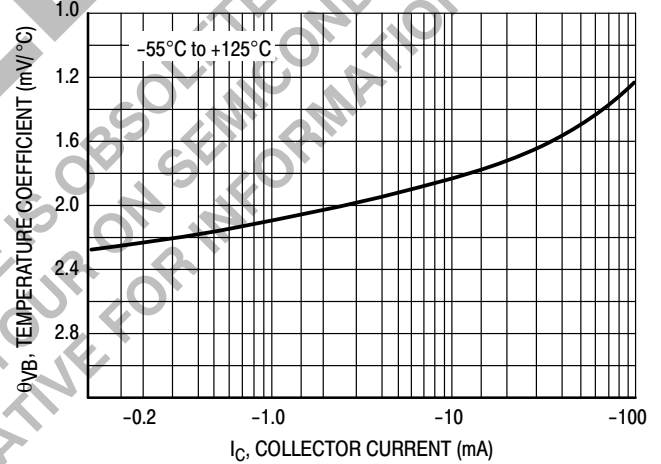


Figure 4. Base-Emitter Temperature Coefficient

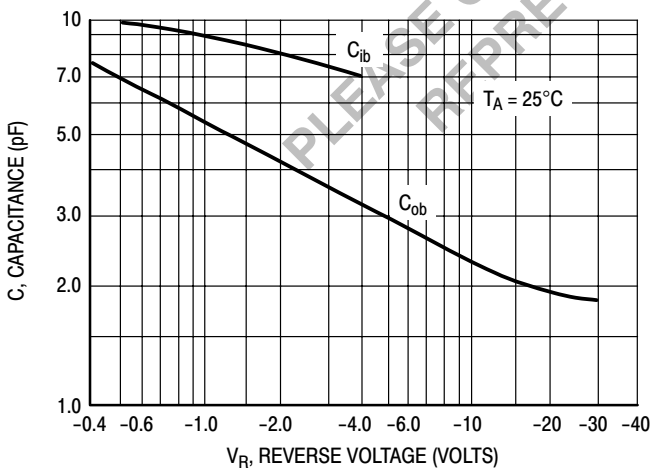


Figure 5. Capacitances

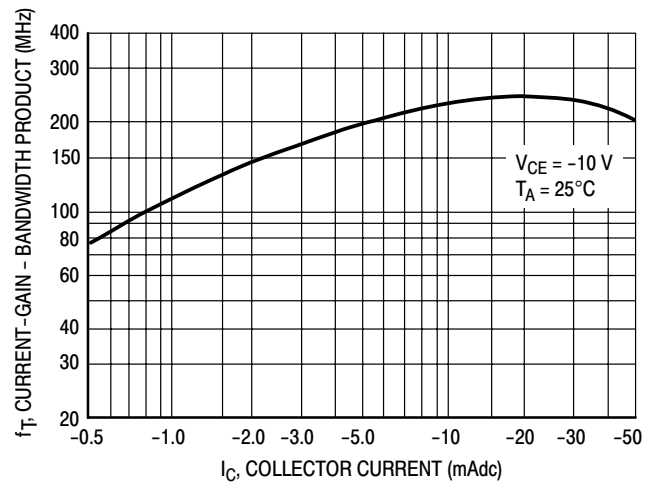


Figure 6. Current-Gain - Bandwidth Product

BC556

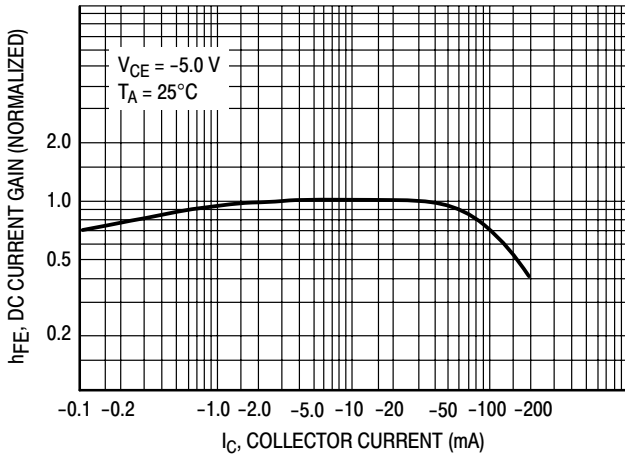


Figure 7. DC Current Gain

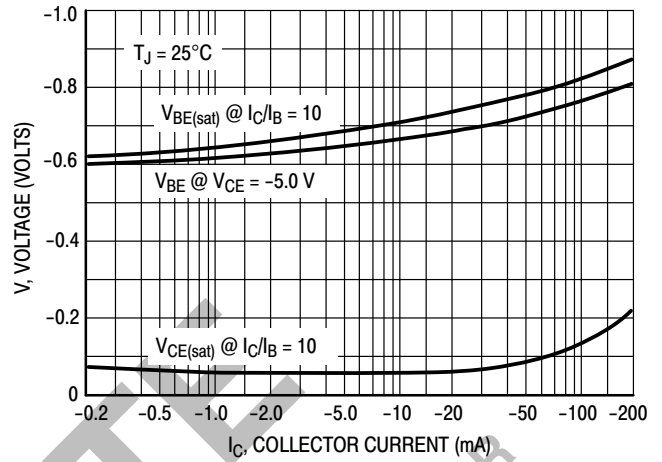


Figure 8. "On" Voltage

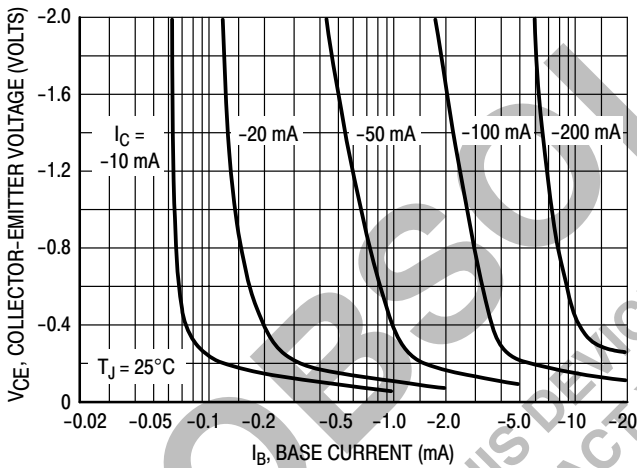


Figure 9. Collector Saturation Region

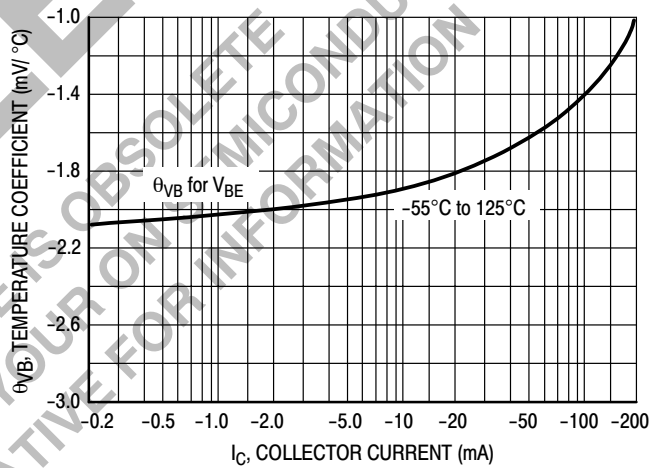


Figure 10. Base-Emitter Temperature Coefficient

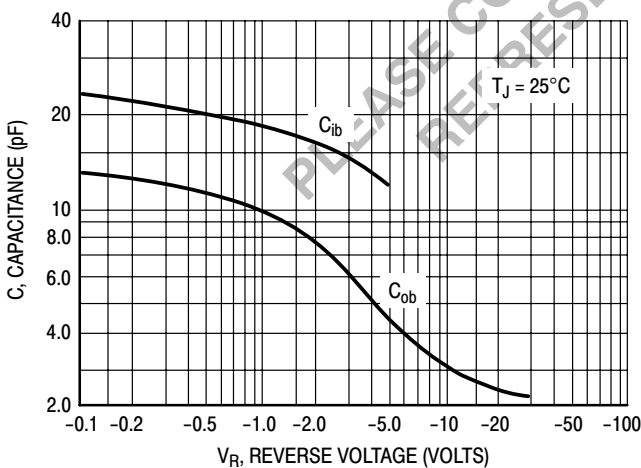


Figure 11. Capacitance

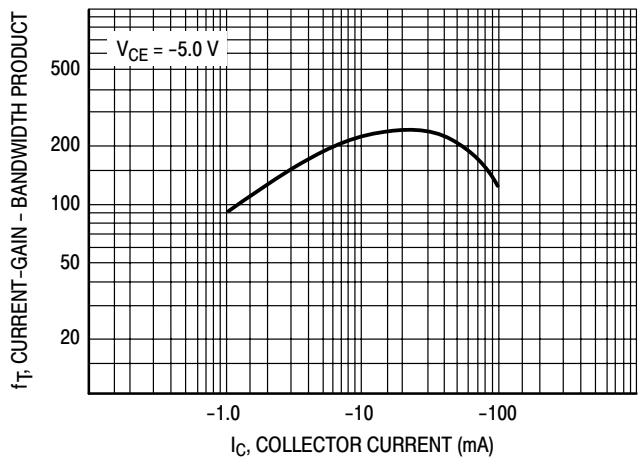


Figure 12. Current-Gain - Bandwidth Product

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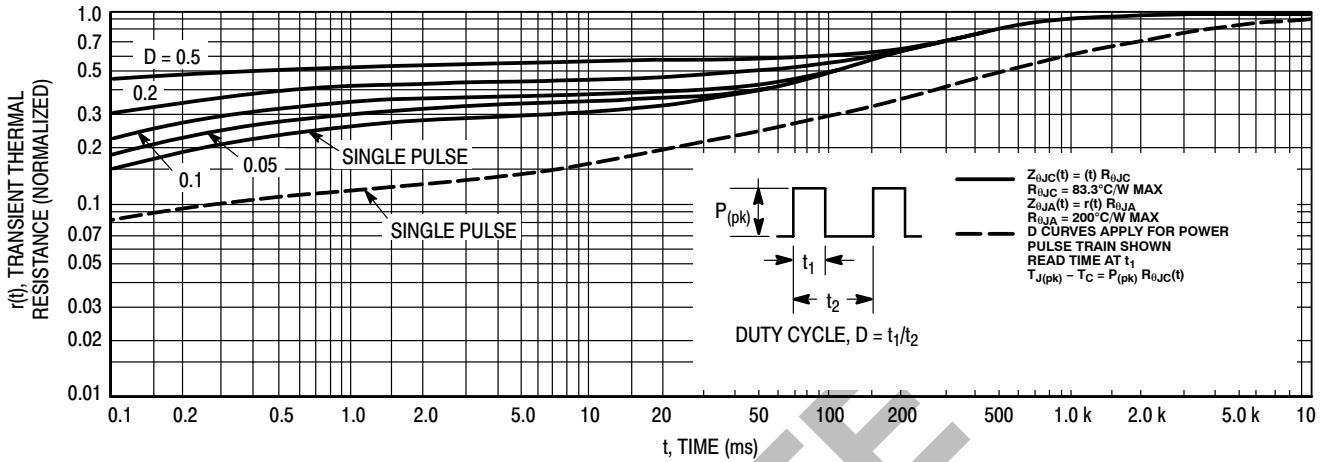


Figure 13. Thermal Response

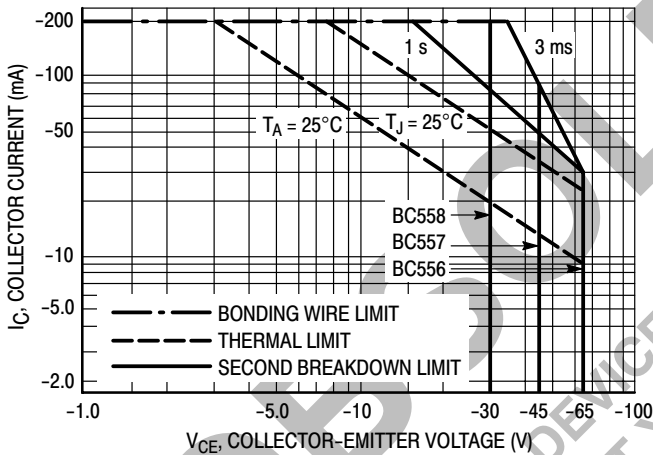


Figure 14. Active Region — Safe Operating Area

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 $T_{J(pk)} = 150^\circ\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^\circ\text{C}$. $T_{J(pk)}$ 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.

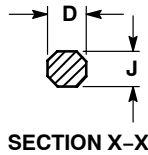
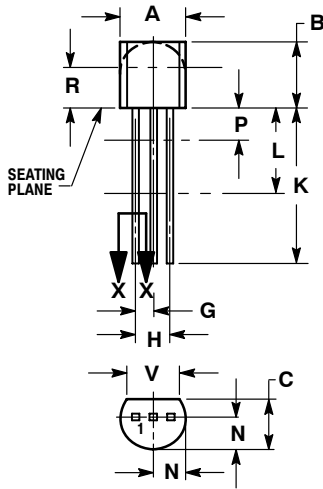
BC556B, BC557, A, B, C, BC558B, C

PACKAGE DIMENSIONS

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REPRESENTATIVE FOR INFORMATION

BC556B, BC557, A, B, C, BC558B, C

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



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 | --- |

STYLE 17:

1. COLLECTOR
2. BASE
3. EMITTER

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