

Low Noise Transistors

PNP Silicon

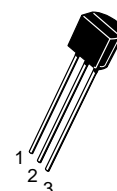
BC559, B, C BC560C

MAXIMUM RATINGS

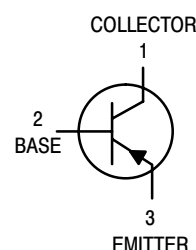
| Rating | Symbol | BC559 | BC560 | Unit |
|--|----------------|-------------|-------|------------------------------|
| Collector–Emitter Voltage | V_{CEO} | –30 | –45 | Vdc |
| Collector–Base Voltage | V_{CBO} | –30 | –50 | Vdc |
| Emitter–Base Voltage | V_{EBO} | –5.0 | | Vdc |
| Collector Current — Continuous | I_C | –100 | | 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 | Watt 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 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C/W}$ |



CASE 29–04, STYLE 17
TO–92 (TO–226AA)



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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | | |
|---|----------------|---------------|------------|--------|-------------|-------------------------|
| Collector–Emitter Breakdown Voltage ($I_C = -10 \text{ mAdc}$, $I_B = 0$) | BC559 BC560 | $V_{(BR)CEO}$ | –30 –45 | — — | — — | Vdc |
| Collector–Base Breakdown Voltage ($I_C = -10 \text{ } \mu\text{Adc}$, $I_E = 0$) | BC559 BC560 | $V_{(BR)CBO}$ | –30 –50 | — — | — — | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = -10 \text{ } \mu\text{Adc}$, $I_C = 0$) | | $V_{(BR)EBO}$ | –5.0 | — | — | Vdc |
| Collector Cutoff Current ($V_{CB} = -30 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = -30 \text{ Vdc}$, $I_E = 0$, $T_A = +125^\circ\text{C}$) | | I_{CBO} | — — | — — | –15 –5.0 | nAdc μAdc |
| Emitter Cutoff Current ($V_{EB} = -4.0 \text{ Vdc}$, $I_C = 0$) | | I_{EBO} | — | — | –15 | nAdc |

BC559, B, C BC560C

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

ON CHARACTERISTICS

| | | | | | | |
|---|---|----------------------|---------------------------------|-------------------------------|-----------------------------|-----|
| DC Current Gain (I _C = -10 µAdc, V _{CE} = -5.0 Vdc) (I _C = -2.0 mAdc, V _{CE} = -5.0 Vdc) | BC559B BC559C/560C BC559B BC559C/560C BC559 | h _{FE} | 100 100 180 380 120 | 150 270 290 500 — | — — 460 800 800 | — |
| Collector-Emitter Saturation Voltage (I _C = -10 mAdc, I _B = -0.5 mAdc) (I _C = -10 mAdc, I _B = see note 1) (I _C = -100 mAdc, I _B = -5.0 mAdc, see note 2) | | V _{CE(sat)} | — — — | -0.075 -0.3 -0.25 | -0.25 -0.6 — | Vdc |
| Base-Emitter Saturation Voltage (I _C = -100 mAdc, I _B = -5.0 mAdc) | | V _{BE(sat)} | — | -1.1 | — | Vdc |
| Base-Emitter On Voltage (I _C = -10 µAdc, V _{CE} = -5.0 Vdc) (I _C = -100 µAdc, V _{CE} = -5.0 Vdc) (I _C = -2.0 mAdc, V _{CE} = -5.0 Vdc) | | V _{BE(on)} | — — -0.55 | -0.52 -0.55 -0.62 | — — -0.7 | Vdc |

SMALL-SIGNAL CHARACTERISTICS

| | | | | | | |
|--|-------------------------|------------------------------------|------------|------------|------------|-----|
| Current-Gain — Bandwidth Product (I _C = -10 mAdc, V _{CE} = -5.0 Vdc, f = 100 MHz) | | f _T | — | 250 | — | MHz |
| Collector-Base Capacitance (V _{CB} = -10 Vdc, I _E = 0, f = 1.0 MHz) | | C _{cbo} | — | 2.5 | — | pF |
| Small-Signal Current Gain (I _C = -2.0 mAdc, V _{CE} = -5.0 V, f = 1.0 kHz) | BC559B BC559C/BC560C | h _{fe} | 240 450 | 330 600 | 500 900 | — |
| Noise Figure (I _C = -200 µAdc, V _{CE} = -5.0 Vdc, R _S = 2.0 kΩ, f = 1.0 kHz) (I _C = -200 µAdc, V _{CE} = -5.0 Vdc, R _S = 100 kΩ, f = 1.0 kHz, Δf = 200 kHz) | | NF ₁ NF ₂ | — — | 0.5 — | 2.0 10 | dB |

NOTES:

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

BC559, B, C BC560C

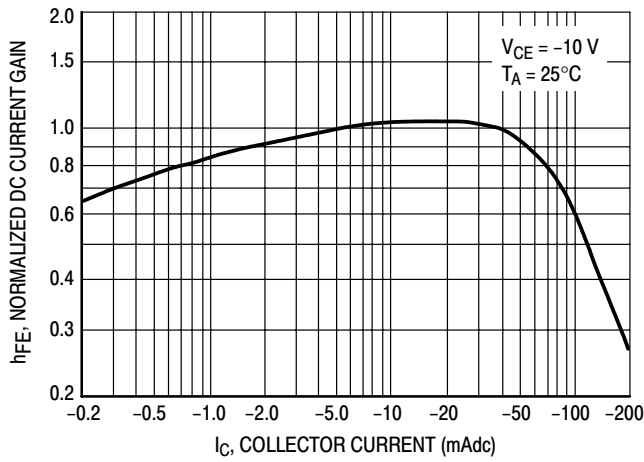


Figure 1. Normalized DC Current Gain

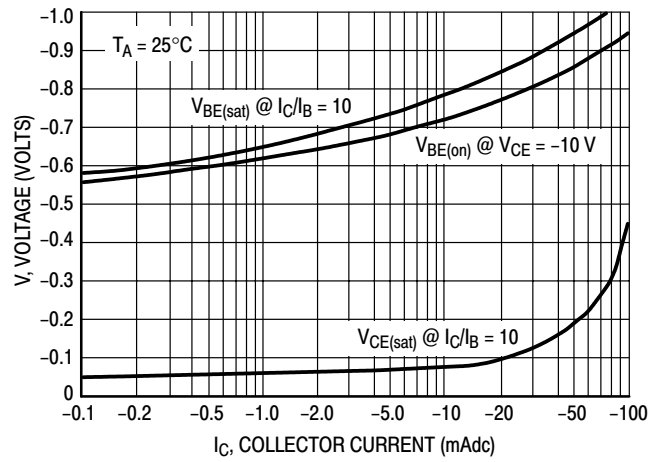


Figure 2. "Saturation" and "On" Voltages

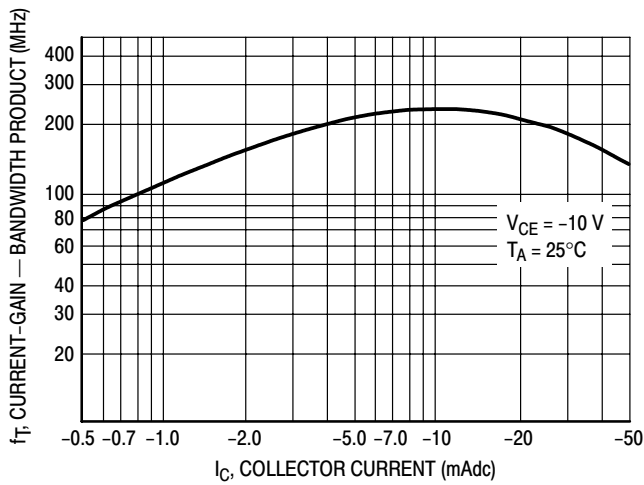


Figure 3. Current-Gain — Bandwidth Product

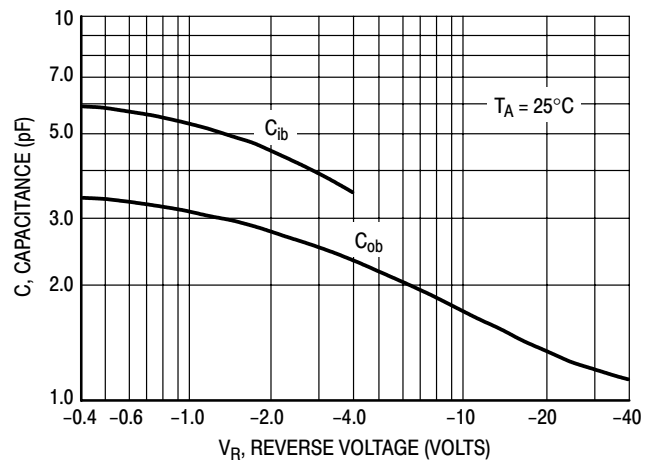


Figure 4. Capacitance

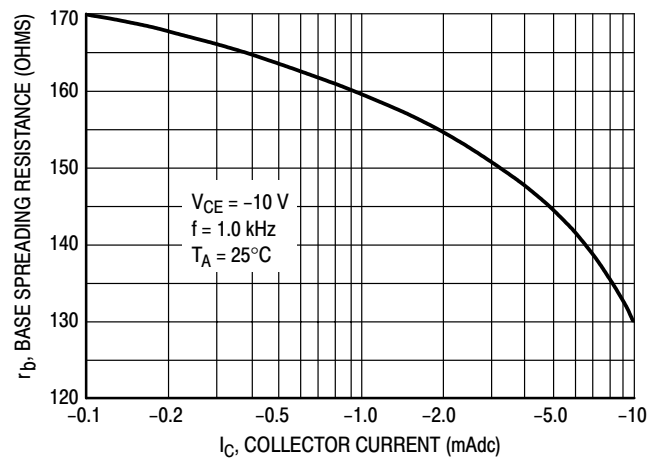
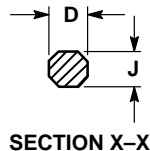
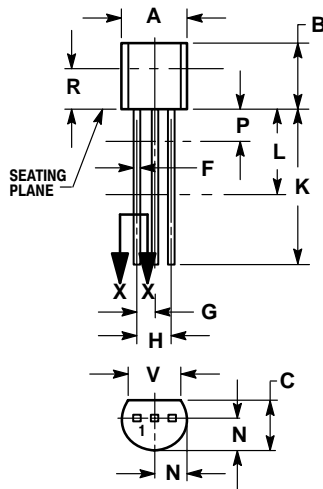


Figure 5. Base Spreading Resistance

BC559, B, C BC560C

PACKAGE DIMENSIONS

CASE 029-04
(TO-226AA)
ISSUE AD




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. 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 | 0.022 | 0.41 | 0.55 |
| F | 0.016 | 0.019 | 0.41 | 0.48 |
| 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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