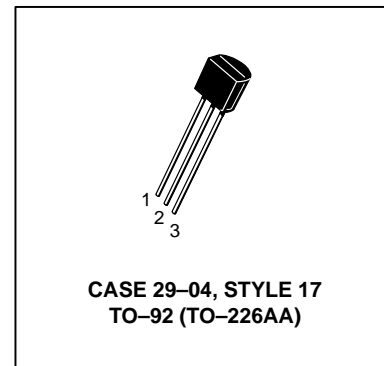


Amplifier Transistors

NPN Silicon

BC546, B
BC547, A, B, C
BC548, A, B, C



MAXIMUM RATINGS

| Rating | Symbol | BC 546 | BC 547 | BC 548 | Unit |
|--|----------------|-------------|--------|--------|---------------|
| Collector–Emitter Voltage | V_{CEO} | 65 | 45 | 30 | Vdc |
| Collector–Base Voltage | V_{CBO} | 80 | 50 | 30 | Vdc |
| Emitter–Base Voltage | V_{EBO} | 6.0 | | | 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/°C |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | | | Watt mW/°C |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | –55 to +150 | | | °C |

THERMAL CHARACTERISTICS

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

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

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

OFF CHARACTERISTICS

| | | | | | | |
|---|--|---------------|-------------------|------------------------|-----------------------|-----------------------------|
| Collector–Emitter Breakdown Voltage ($I_C = 1.0\text{ mA}, I_B = 0$) | BC546 BC547 BC548 | $V_{(BR)CEO}$ | 65 45 30 | — — — | — — — | V |
| Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{Adc}$) | BC546 BC547 BC548 | $V_{(BR)CBO}$ | 80 50 30 | — — — | — — — | V |
| Emitter–Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{A}, I_C = 0$) | BC546 BC547 BC548 | $V_{(BR)EBO}$ | 6.0 6.0 6.0 | — — — | — — — | V |
| Collector Cutoff Current ($V_{CE} = 70\text{ V}, V_{BE} = 0$) ($V_{CE} = 50\text{ V}, V_{BE} = 0$) ($V_{CE} = 35\text{ V}, V_{BE} = 0$) ($V_{CE} = 30\text{ V}, T_A = 125^\circ\text{C}$) | BC546 BC547 BC548 BC546/547/548 | I_{CES} | — — — — | 0.2 0.2 0.2 — | 15 15 15 4.0 | nA μA |

BC546, B BC547, A, B, C BC548, A, B, C
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|---|----------|--|----------------------------------|--|
| ON CHARACTERISTICS | | | | | |
| DC Current Gain ($I_C = 10\ \mu\text{A}$, $V_{CE} = 5.0\ \text{V}$) | BC547A/548A BC546B/547B/548B BC548C | h_{FE} | — — — | 90 150 270 | — — — |
| ($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$) | BC546 BC547 BC548 BC547A/548A BC546B/547B/548B BC547C/BC548C | | 110 110 110 110 200 420 | — — — 180 290 520 | 450 800 800 220 450 800 |
| ($I_C = 100\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$) | BC547A/548A BC546B/547B/548B BC548C | | — — — | 120 180 300 | — — — |
| Collector–Emitter Saturation Voltage ($I_C = 10\ \text{mA}$, $I_B = 0.5\ \text{mA}$) ($I_C = 100\ \text{mA}$, $I_B = 5.0\ \text{mA}$) ($I_C = 10\ \text{mA}$, $I_B = \text{See Note 1}$) | $V_{CE(sat)}$ | | — — — | 0.09 0.2 0.3 | 0.25 0.6 0.6 |
| Base–Emitter Saturation Voltage ($I_C = 10\ \text{mA}$, $I_B = 0.5\ \text{mA}$) | $V_{BE(sat)}$ | | — | 0.7 | — |
| Base–Emitter On Voltage ($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$) ($I_C = 10\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$) | $V_{BE(on)}$ | | 0.55 — | — — | 0.7 0.77 |

SMALL–SIGNAL CHARACTERISTICS

| | | | | | | |
|--|--|-----------|---------------------------------|-----------------------------|---------------------------------|-----|
| Current–Gain — Bandwidth Product ($I_C = 10\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$, $f = 100\ \text{MHz}$) | BC546 BC547 BC548 | f_T | 150 150 150 | 300 300 300 | — — — | MHz |
| Output Capacitance ($V_{CB} = 10\ \text{V}$, $I_C = 0$, $f = 1.0\ \text{MHz}$) | | C_{obo} | — | 1.7 | 4.5 | pF |
| Input Capacitance ($V_{EB} = 0.5\ \text{V}$, $I_C = 0$, $f = 1.0\ \text{MHz}$) | | C_{ibo} | — | 10 | — | pF |
| Small–Signal Current Gain ($I_C = 2.0\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$, $f = 1.0\ \text{kHz}$) | BC546 BC547/548 BC547A/548A BC546B/547B/548B BC547C/548C | h_{fe} | 125 125 125 240 450 | — — 220 330 600 | 500 900 260 500 900 | — |
| Noise Figure ($I_C = 0.2\ \text{mA}$, $V_{CE} = 5.0\ \text{V}$, $R_S = 2\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$, $\Delta f = 200\ \text{Hz}$) | BC546 BC547 BC548 | NF | — — — | 2.0 2.0 2.0 | 10 10 10 | dB |

Note 1: I_B is value for which $I_C = 11\ \text{mA}$ at $V_{CE} = 1.0\ \text{V}$.

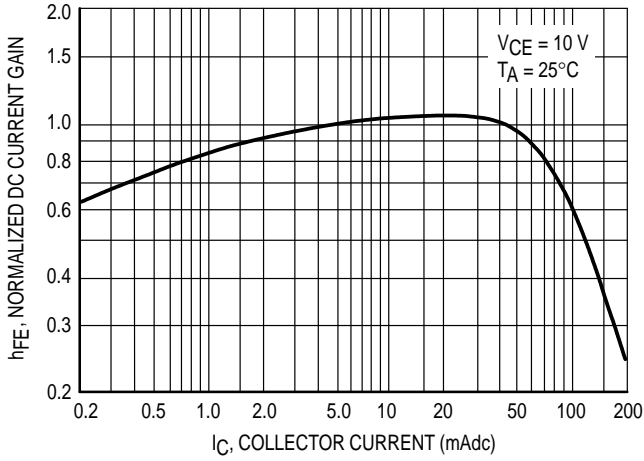


Figure 1. Normalized DC Current Gain

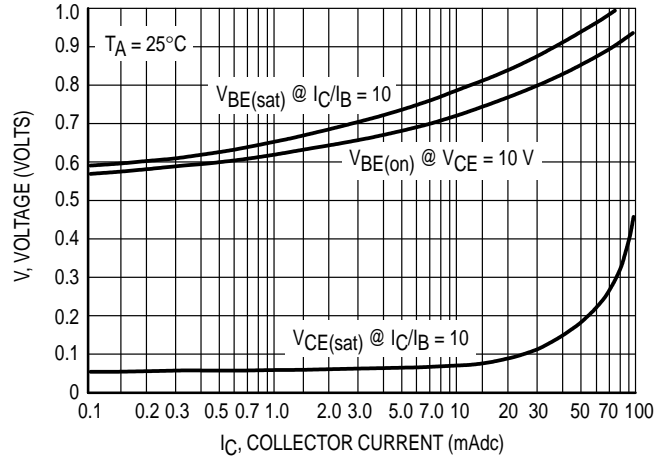


Figure 2. "Saturation" and "On" Voltages

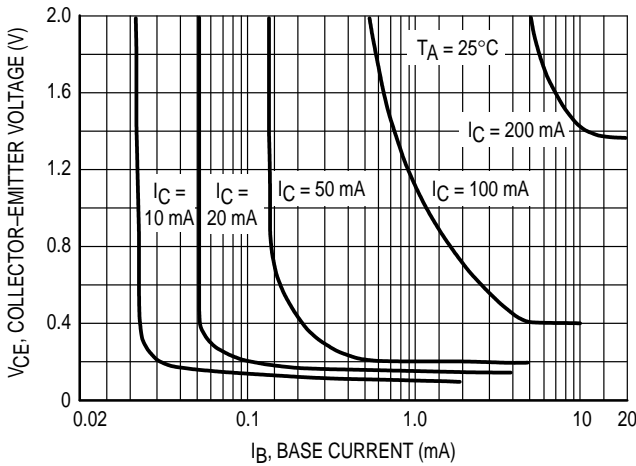


Figure 3. Collector Saturation Region

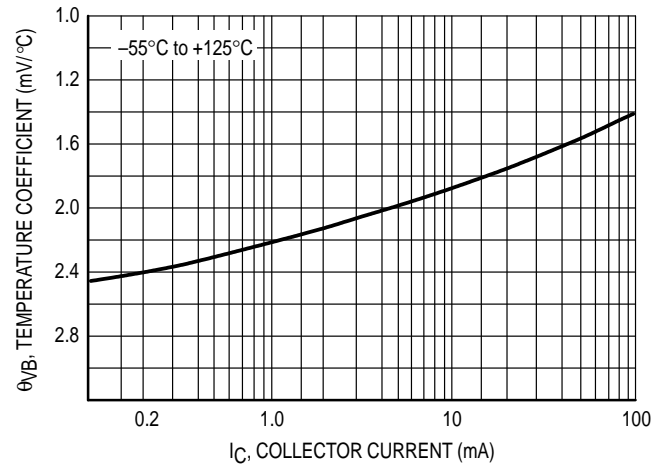


Figure 4. Base-Emitter Temperature Coefficient

BC547/BC548

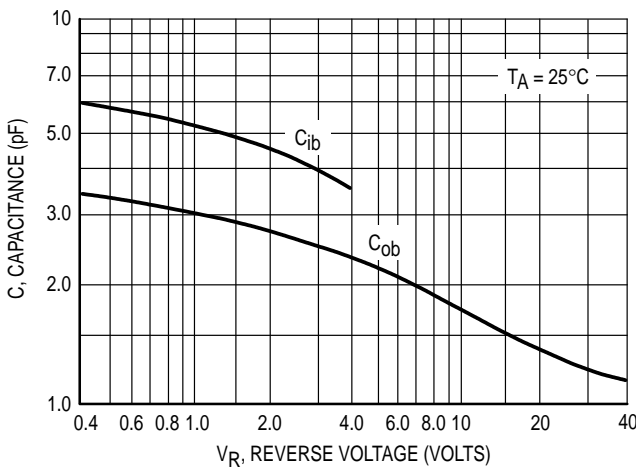


Figure 5. Capacitances

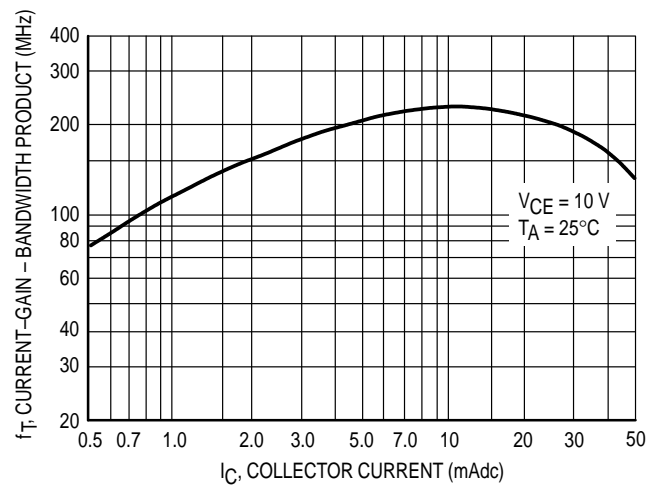


Figure 6. Current-Gain - Bandwidth Product

BC547/BC548

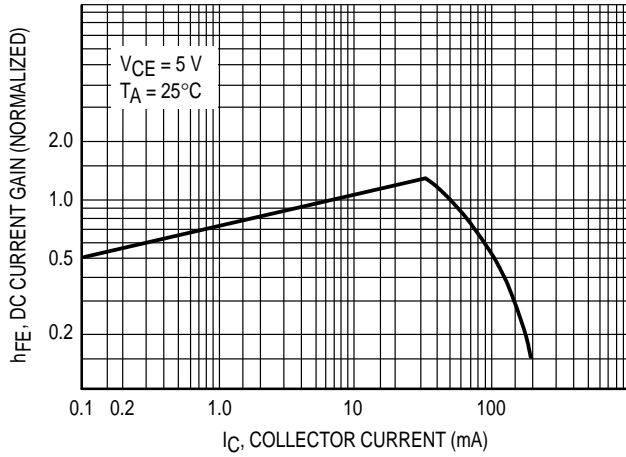


Figure 7. DC Current Gain

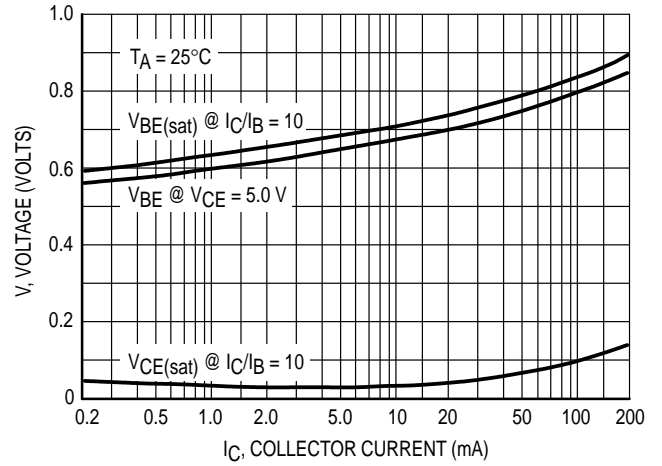


Figure 8. "On" Voltage

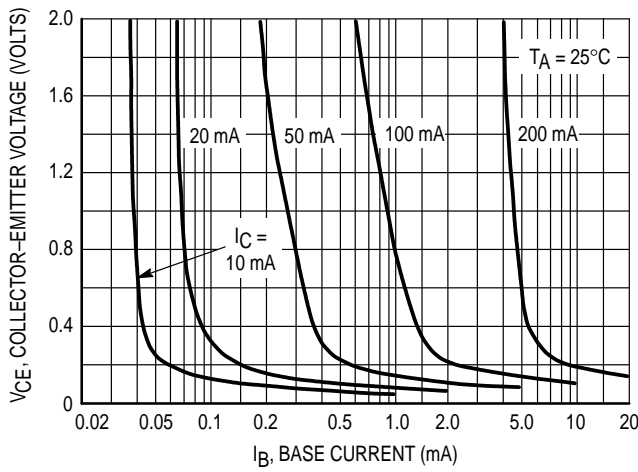


Figure 9. Collector Saturation Region

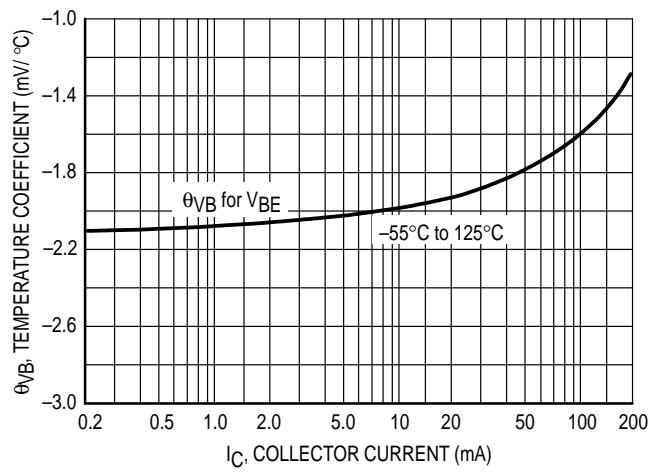


Figure 10. Base-Emitter Temperature Coefficient

BC546

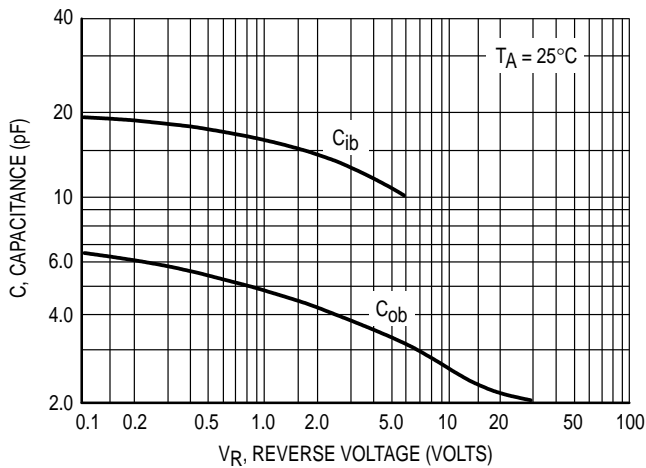


Figure 11. Capacitance

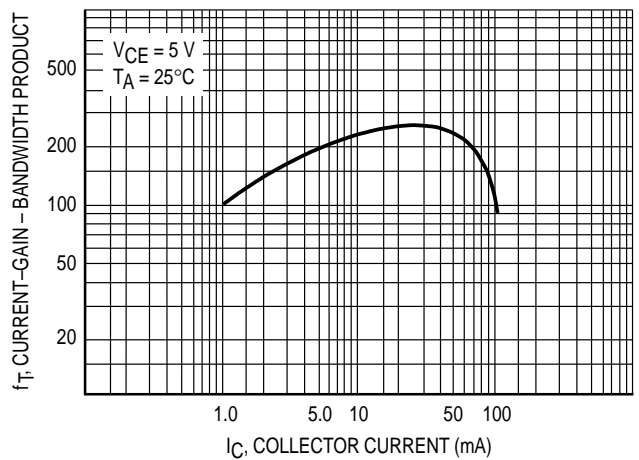
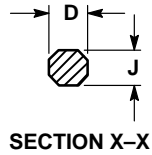
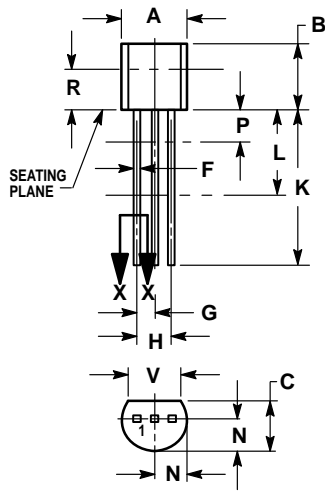


Figure 12. Current-Gain - Bandwidth Product

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. PIN 1. COLLECTOR
 2. BASE
 3. EMITTER

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