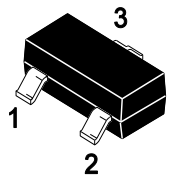
# General Purpose Transistors

## PNP Silicon

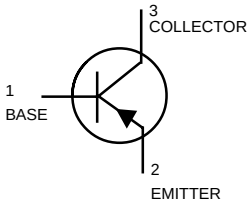
**BC807-16**
**BC807-25**
**BC807-40**

### FEATURE

- Collector current capability $I_C$ = -500 mA.
- Collector-emitter voltage $V_{CEO}$(max) = -45 V.
- General purpose switching and amplification.
- PNP complement: BC807 Series.
- We declare that the material of product compliance with RoHS requirements.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.




SOT-23




### DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|---|---|---|
| BC807-16<br>S-BC807-16 | 5A1 | 3000/Tape&Reel |
| BC807-25<br>S-BC807-25 | 5B1 | 3000/Tape&Reel |
| BC807-40<br>S-BC807-40 | 5C1 | 3000/Tape&Reel |

### MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector–Emitter Voltage | $V_{CEO}$ | –45 | V |
| Collector–Base Voltage | $V_{CBO}$ | –50 | V |
| Emitter–Base Voltage | $V_{EBO}$ | –5.0 | V |
| Collector Current — Continuous | $I_C$ | –500 | mAdc |

### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Total Device Dissipation FR– 5 Board, (1)<br>$T_A$ = 25°C<br>Derate above 25°C | $P_D$ | <br>225<br>1.8 | <br>mW<br>mW/°C |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 556 | °C/W |
| Total Device Dissipation<br>Alumina Substrate, (2) $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | <br>300<br>2.4 | <br>mW<br>mW/°C |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 417 | °C/W |
| Junction and Storage Temperature | $T_J$ , $T_{stg}$ | –55 to +150 | °C |

1. FR–5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector–Emitter Breakdown Voltage ($I_C$ = –10 mA) | $V_{(BR)CEO}$ | –45 | — | — | V |
| Collector–Emitter Breakdown Voltage ($V_{EB}$ = 0, $I_C$ = –10 µA) | $V_{(BR)CES}$ | –50 | — | — | V |
| Emitter–Base Breakdown Voltage ($I_E$ = –1.0 µA) | $V_{(BR)EBO}$ | –5.0 | — | — | V |
| Collector Cutoff Current | $I_{CBO}$ | | | | |
| ($V_{CB}$ = –20 V) | | — | — | –100 | nA |
| ($V_{CB}$ = –20 V, $T_J$ = 150°C) | | — | — | –5.0 | µA |

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

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **ON CHARACTERISTICS** | | | | | | |
| DC Current Gain | | $h_{FE}$ | | | | — |
| ($I_C$= –100 mA, $V_{CE}$ = –1.0 V) | LBC807–16 | | 100 | — | 250 | |
| | LBC807–25 | | 160 | — | 400 | |
| | LBC807–40 | | 250 | — | 600 | |
| ($I_C$ = –500 mA, $V_{CE}$ = –1.0 V) | | | 40 | — | — | |
| Collector–Emitter Saturation Voltage ($I_C$ = –500 mA, $I_B$ = –50 mA) | | $V_{CE(sat)}$ | — | — | –0.7 | V |
| Base–Emitter On Voltage ($I_C$ = –500 mA, $V_{CE}$= –1.0 V) | | $V_{BE(on)}$ | — | — | –1.2 | V |
| **SMALL–SIGNAL CHARACTERISTICS** | | | | | | |
| Current–Gain — Bandwidth Product ($I_C$ = –10 mA, $V_{CE}$ = –5.0 $V_{dc}$, f = 100 MHz) | | $f_T$ | 100 | — | — | MHz |
| Output Capacitance ($V_{CB}$ = –10 V, f = 1.0 MHz) | | $C_{obo}$ | — | 10 | — | pF |

## TYPICAL CHARACTERISTICS –BC807-16

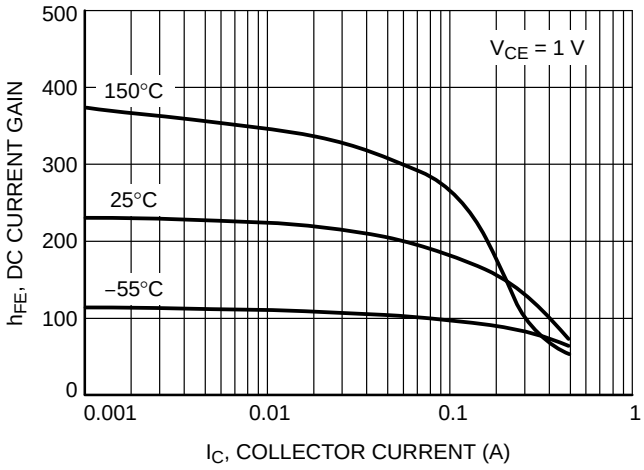



**Figure 1. DC Current Gain vs. Collector Current**

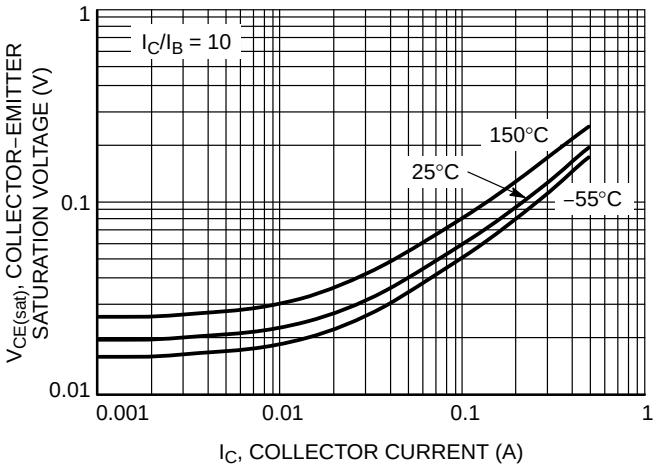



**Figure 2. Collector Emitter Saturation Voltage vs. Collector Current**

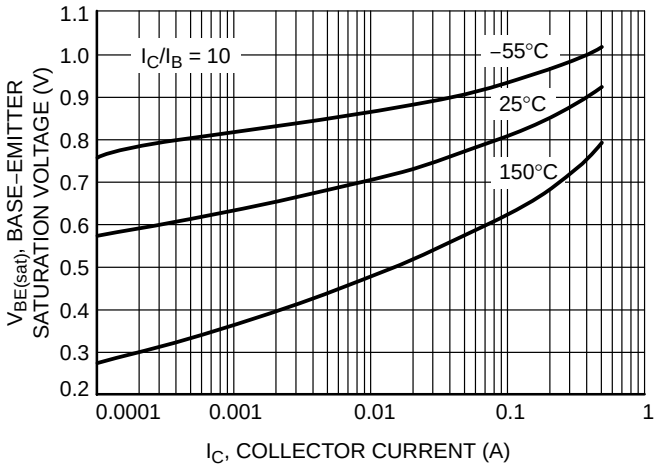



**Figure 3. Base Emitter Saturation Voltage vs. Collector Current**

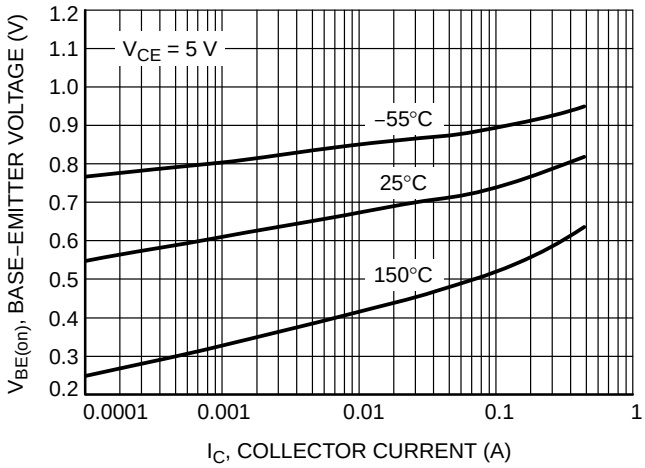



**Figure 4. Base Emitter Voltage vs. Collector Current**

## TYPICAL CHARACTERISTICS – BC807–16

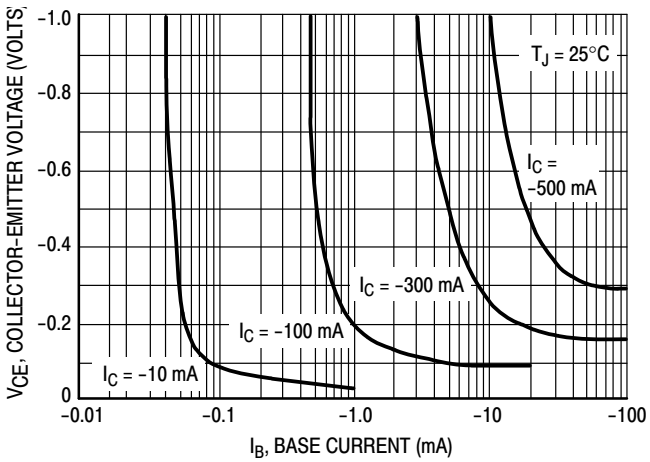



**Figure 5. Saturation Region**

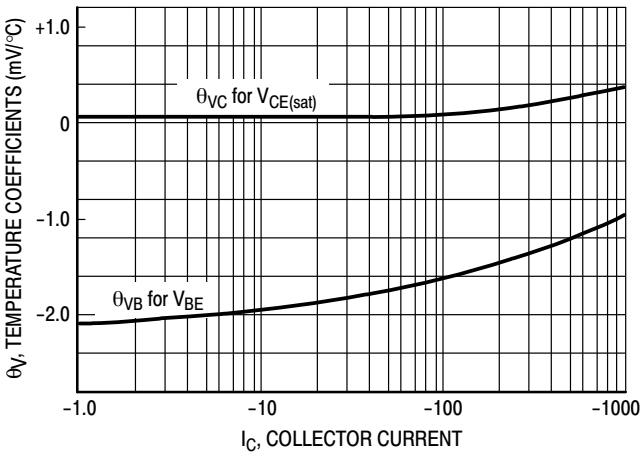



**Figure 6. Temperature Coefficients**

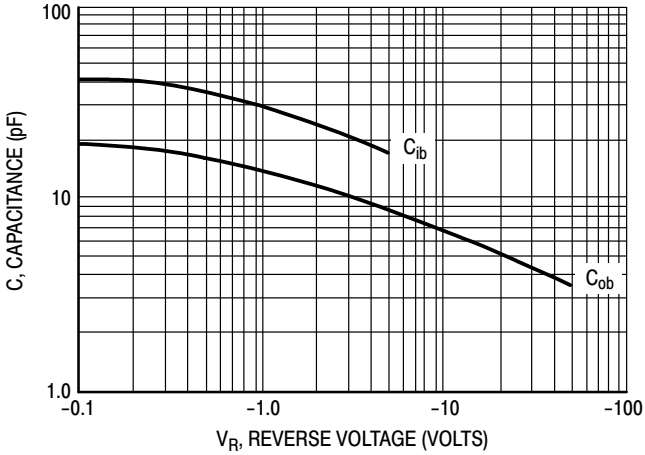



**Figure 7. Capacitances**

## TYPICAL CHARACTERISTICS – BC807–25

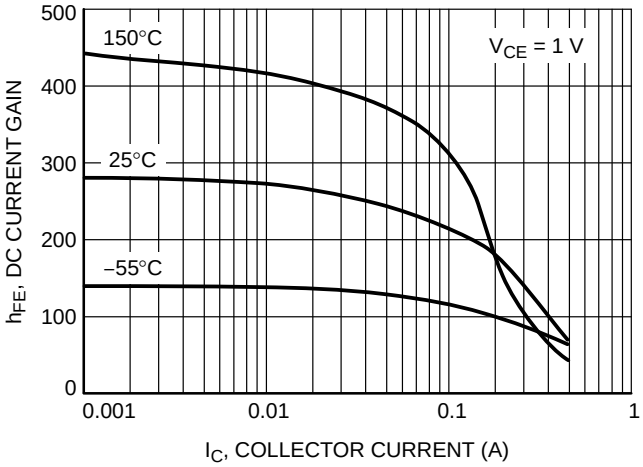



**Figure 8. DC Current Gain vs. Collector Current**

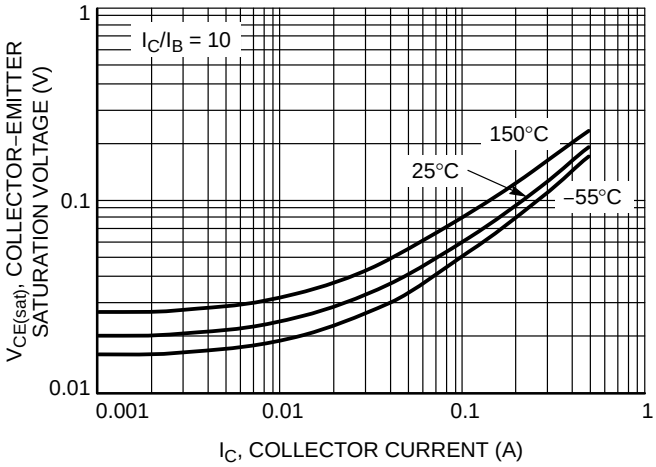



**Figure 9. Collector Emitter Saturation Voltage vs. Collector Current**

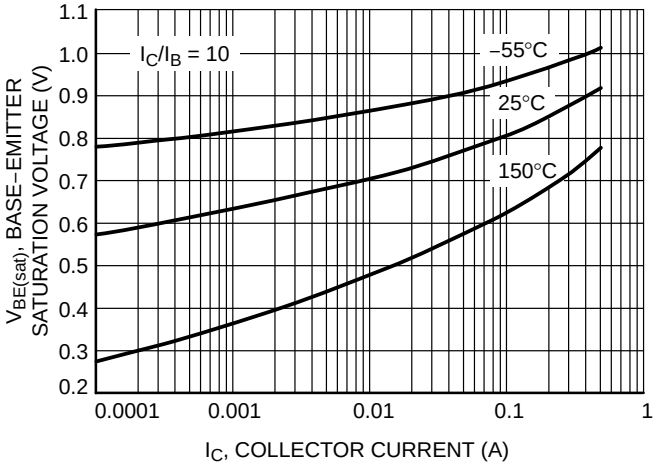



**Figure 10. Base Emitter Saturation Voltage vs. Collector Current**

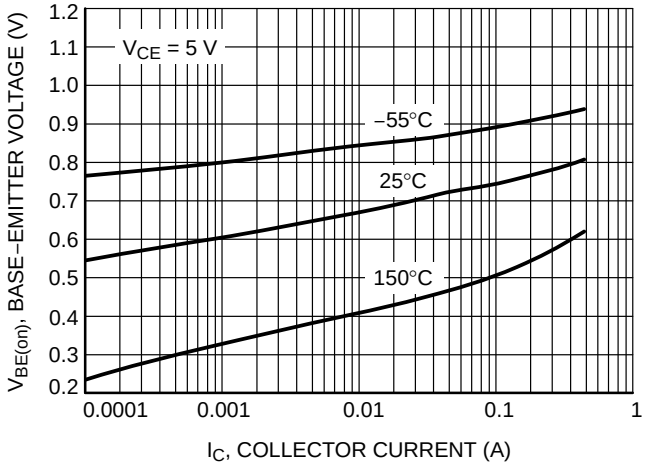



**Figure 11. Base Emitter Voltage vs. Collector Current**

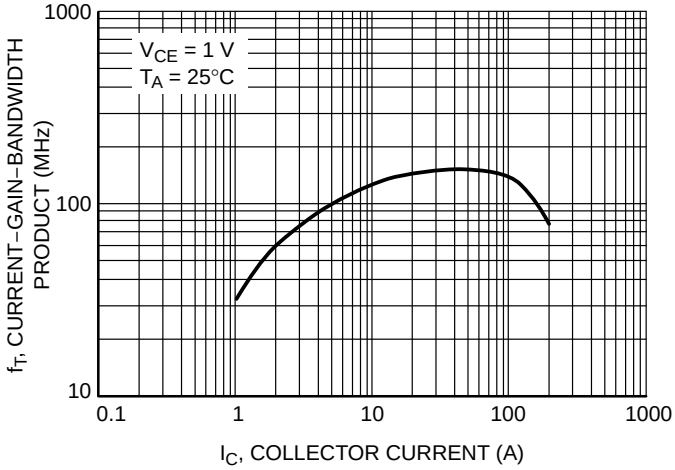



**Figure 12. Current Gain Bandwidth Product vs. Collector Current**

## TYPICAL CHARACTERISTICS – BC807–25

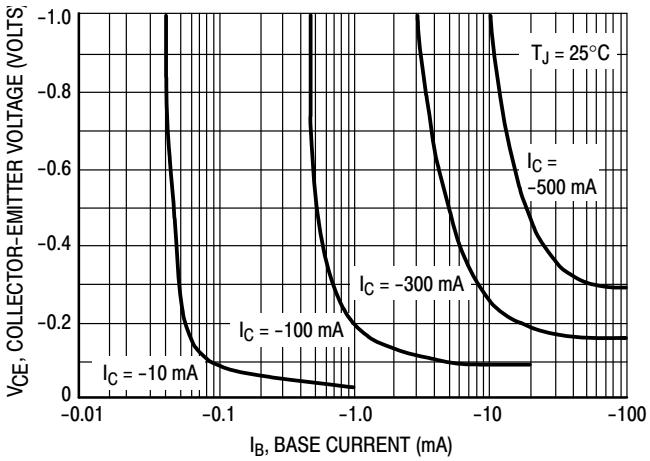



**Figure 13. Saturation Region**

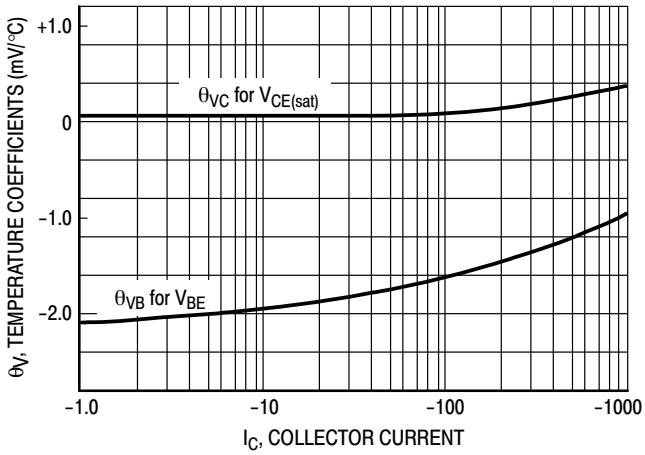



**Figure 14. Temperature Coefficients**

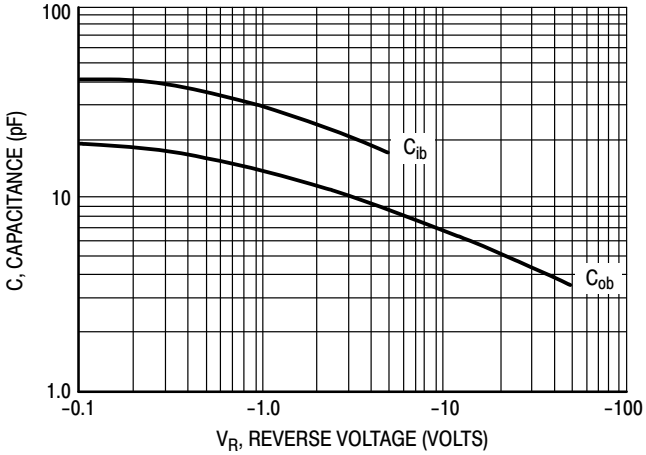



**Figure 15. Capacitances**

## TYPICAL CHARACTERISTICS – BC807–40

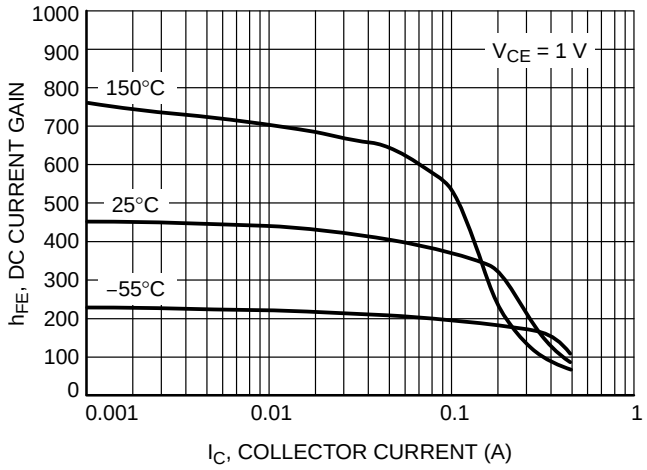



**Figure 16. DC Current Gain vs. Collector Current**

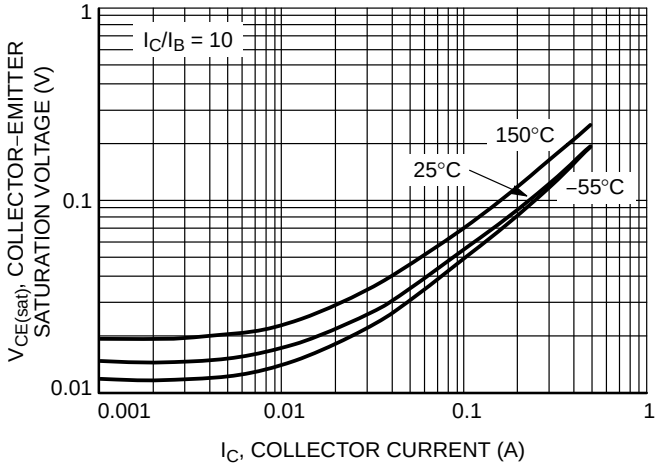



**Figure 17. Collector Emitter Saturation Voltage vs. Collector Current**

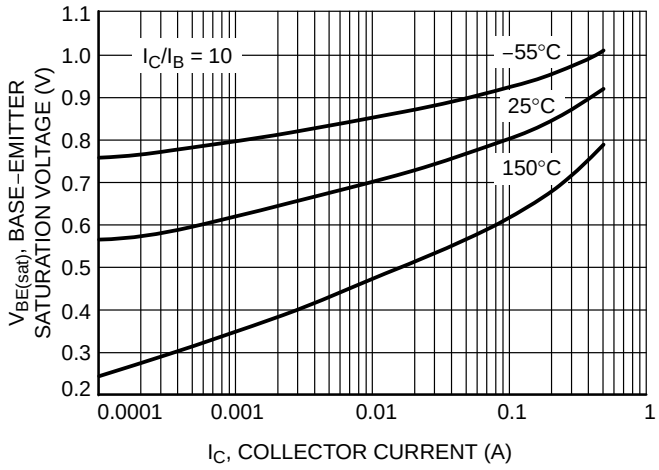



**Figure 18. Base Emitter Saturation Voltage vs. Collector Current**

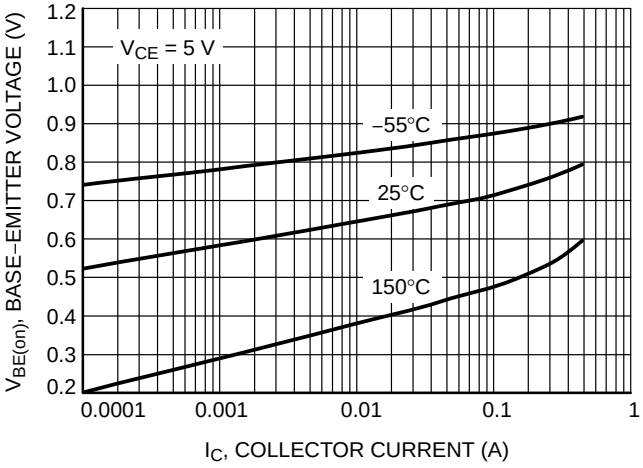



**Figure 19. Base Emitter Voltage vs. Collector Current**

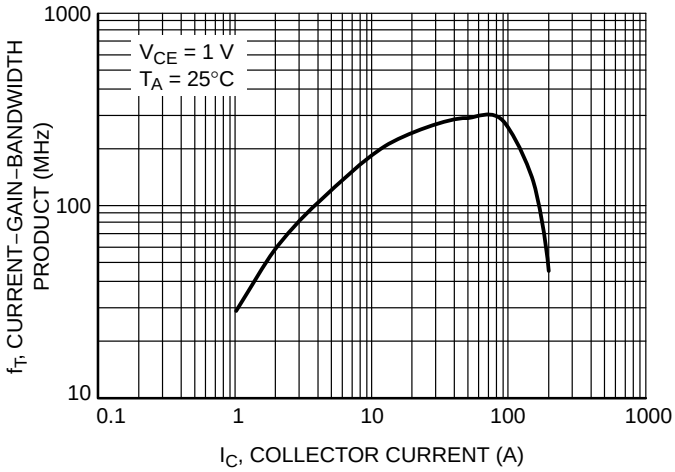



**Figure 20. Current Gain Bandwidth Product vs. Collector Current**

## TYPICAL CHARACTERISTICS – BC807–40

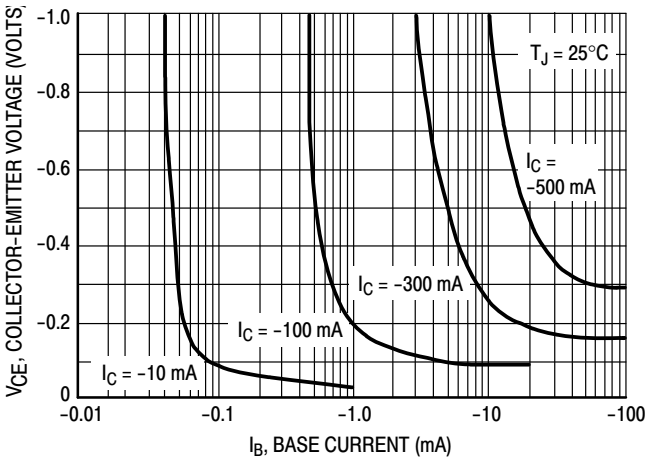



**Figure 21. Saturation Region**

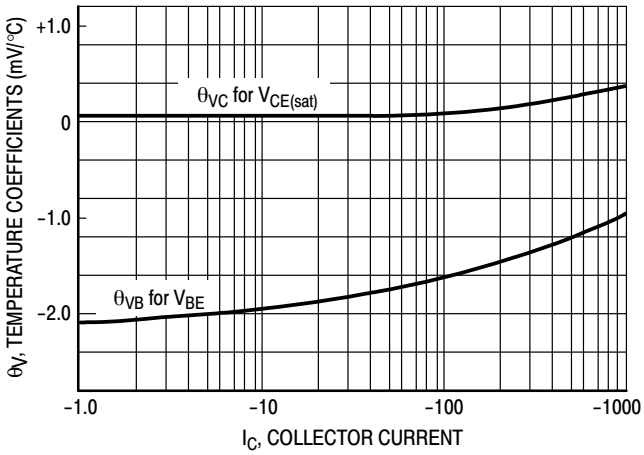



**Figure 22. Temperature Coefficients**

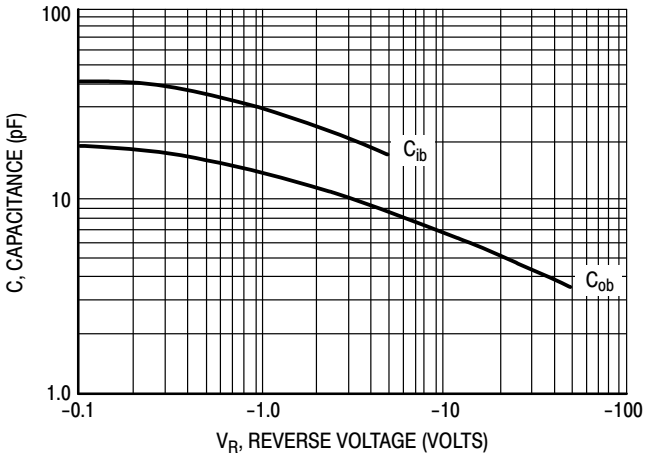



**Figure 23. Capacitances**

## TYPICAL CHARACTERISTICS –BC807-16, BC807–25, BC807–40

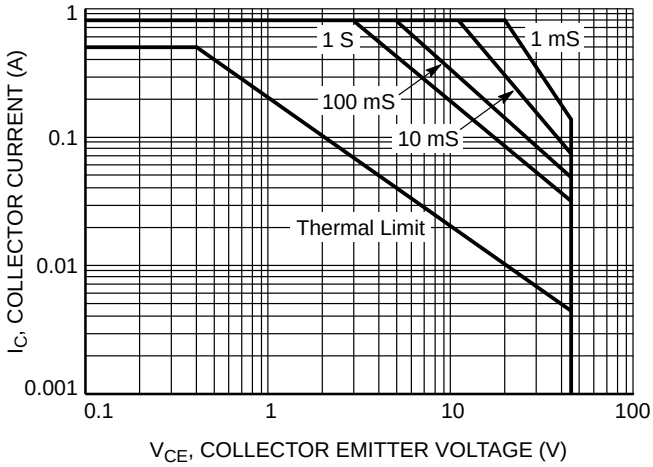
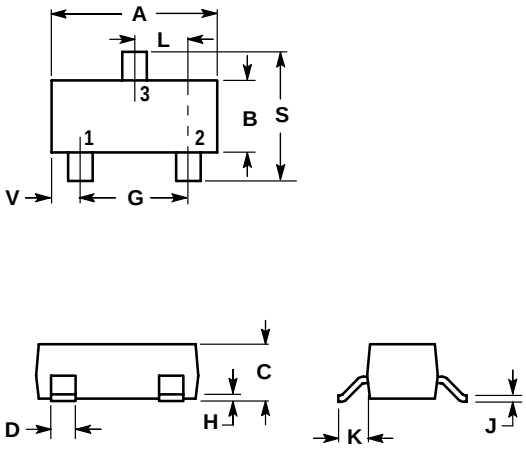



**Figure 24. Safe Operating Area**

## SOT-23




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.1102 | 0.1197 | 2.80 | 3.04 |
| B | 0.0472 | 0.0551 | 1.20 | 1.40 |
| C | 0.0350 | 0.0440 | 0.89 | 1.11 |
| D | 0.0150 | 0.0200 | 0.37 | 0.50 |
| G | 0.0701 | 0.0807 | 1.78 | 2.04 |
| H | 0.0005 | 0.0040 | 0.013 | 0.100 |
| J | 0.0034 | 0.0070 | 0.085 | 0.177 |
| K | 0.0140 | 0.0285 | 0.35 | 0.69 |
| L | 0.0350 | 0.0401 | 0.89 | 1.02 |
| S | 0.0830 | 0.1039 | 2.10 | 2.64 |
| V | 0.0177 | 0.0236 | 0.45 | 0.60 |