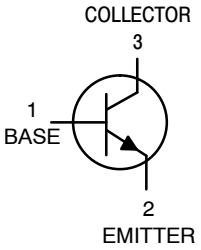
General Purpose Transistors

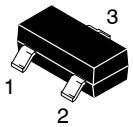
NPN Silicon

BC817-16L, SBC817-16L, BC817-25L, SBC817-25L, BC817-40L, SBC817-40L



Features

- S and NSV Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant



SOT−23
CASE 318
STYLE 6

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

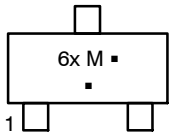
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR−5 Board, (Note 1) T_A = 25°C Derate above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (Note 2) T_A = 25°C Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature	T_J, T_{stg}	−65 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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.

MARKING DIAGRAM



6x = Device Code
x = A, B, or C
M = Date Code*
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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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 = 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 (V_{CB} = 20 V)	I_{CBO}	–	–	100	nA
(V_{CB} = 20 V, T_A = 150°C)		–	–	5.0	μA
ON CHARACTERISTICS					
DC Current Gain (I_C = 100 mA, V_{CE} = 1.0 V) BC817−16, SBC817−16	h_{FE}	100	–	250	–
BC817−25, SBC817−25		160	–	400	
BC817−40, SBC817−40		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 Vdc, f = 100 MHz)	f_T	100	–	–	MHz
Output Capacitance (V_{CB} = 10 V, f = 1.0 MHz)	C_{obo}	–	10	–	pF
SWITCHING CHARACTERISTICS					
Delay Time (V_{CC} = 3.0 Vdc, V_{BE} = 0.5 V, I_C = 10 mA)	t_d	–	85	–	ns
Rise Time (V_{CC} = 3.0 Vdc, V_{BE} = 0.5 V, I_C = 10 mA)	t_r	–	30	–	ns
Storage Time (V_{CC} = 3.0 Vdc, I_C = 10 mA, I_{B1} = 1 mA, I_{B2} = 1 mA)	t_s	–	1000	–	ns
Fall Time (V_{CC} = 3.0 Vdc, I_C = 10 mA, , I_{B1} = 1 mA, I_{B2} = 1 mA)	t_f	–	300	–	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

ORDERING INFORMATION

Device	Specific Marking	Package	Shipping†
BC817−16LT1G	6A	SOT−23 (Pb−Free)	3000 / Tape & Reel
NSVBC817−16LT1G			
BC817−16LT3G			10,000 / Tape & Reel
SBC817−16LT3G			
BC817−25LT1G	6B	SOT−23 (Pb−Free)	3000 / Tape & Reel
SBC817−25LT1G			
BC817−25LT3G			10,000 / Tape & Reel
SBC817−25LT3G			
BC817−40LT1G	6C	SOT−23 (Pb−Free)	3000 / Tape & Reel
SBC817−40LT1G			
BC817−40LT3G			10,000 / Tape & Reel
SBC817−40LT3G			

†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.

TYPICAL CHARACTERISTICS − BC817−16L, SBC817−16L

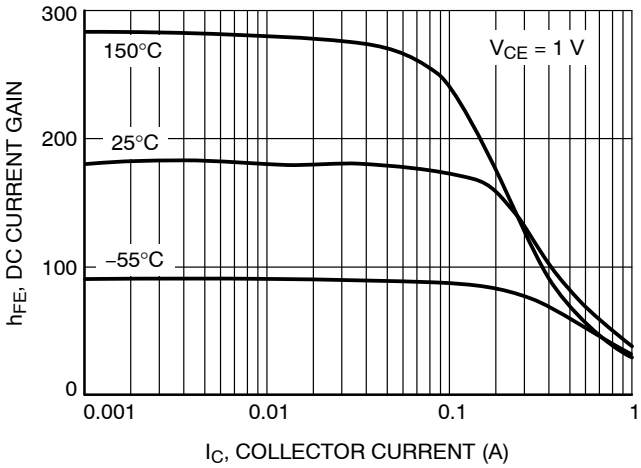

Figure 1. DC Current Gain vs. Collector Current

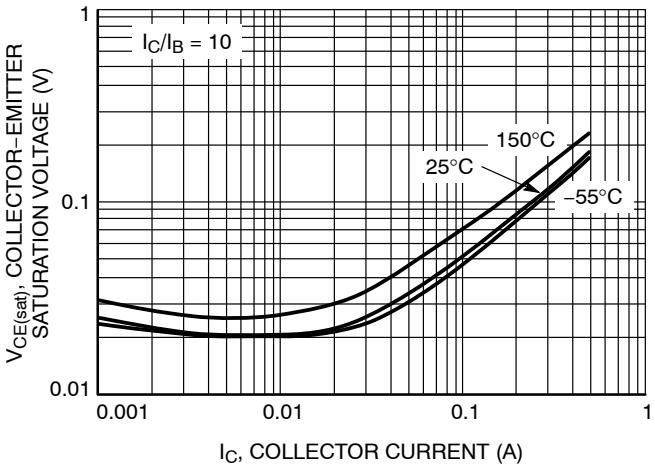

Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

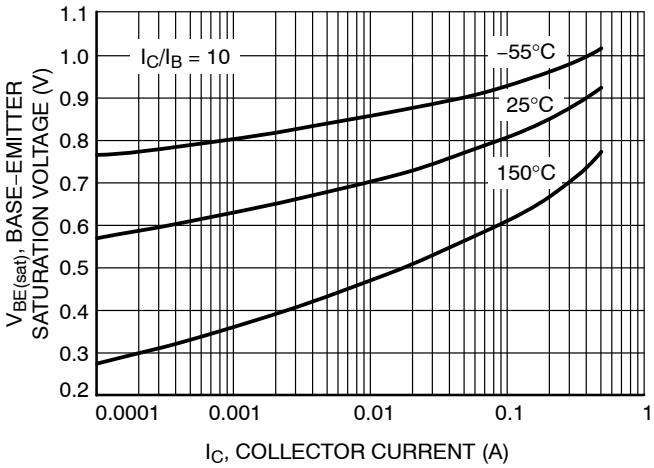

Figure 3. Base Emitter Saturation Voltage vs. Collector Current

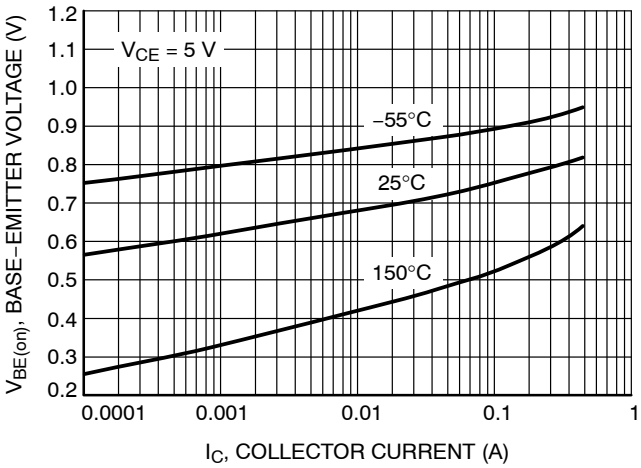

Figure 4. Base Emitter Voltage vs. Collector Current

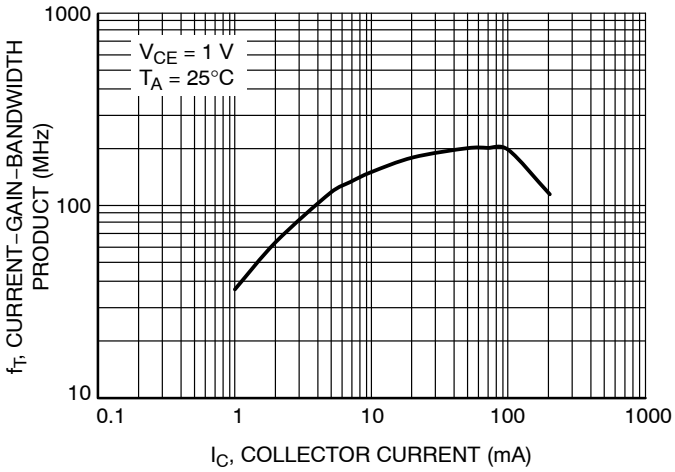

Figure 5. Current Gain Bandwidth Product vs. Collector Current

TYPICAL CHARACTERISTICS − BC817−16L, SBC817−16L

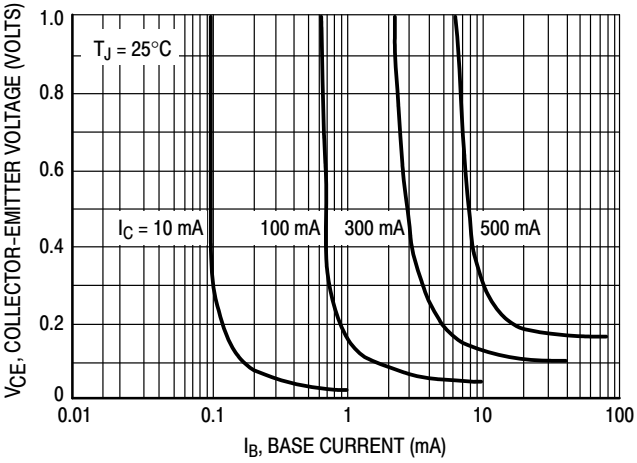

Figure 6. Saturation Region

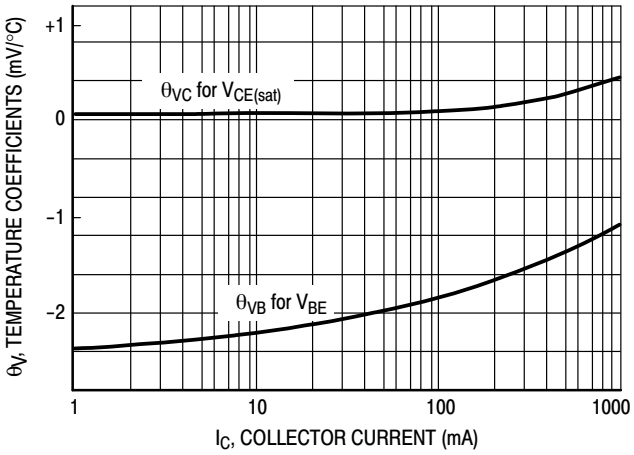

Figure 7. Temperature Coefficients

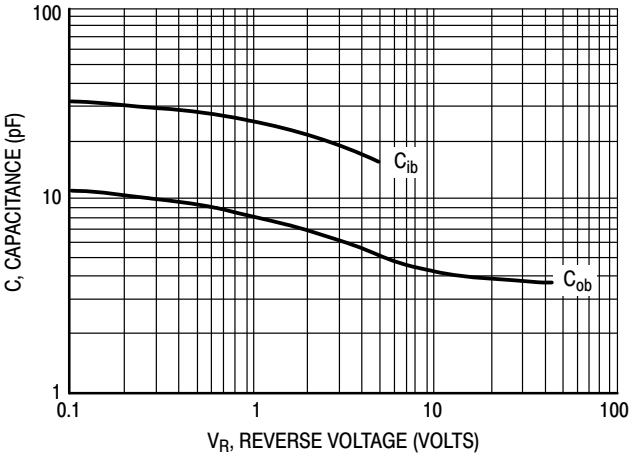

Figure 8. Capacitances

TYPICAL CHARACTERISTICS − BC817−25L, SBC817−25L

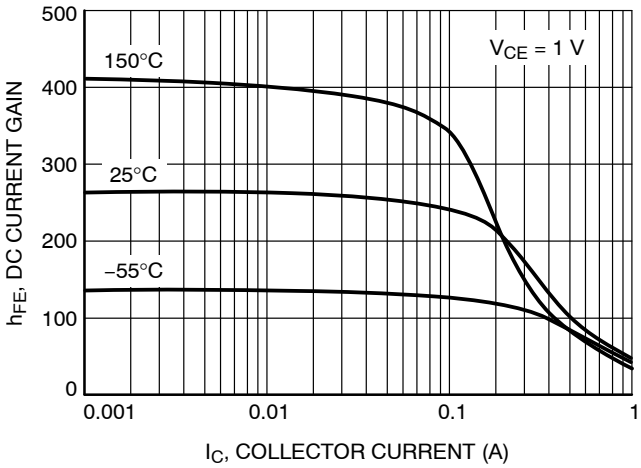

Figure 9. DC Current Gain vs. Collector Current

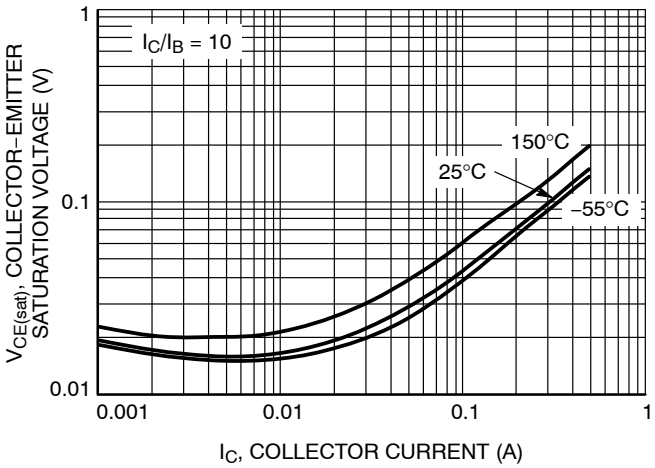

Figure 10. Collector Emitter Saturation Voltage vs. Collector Current

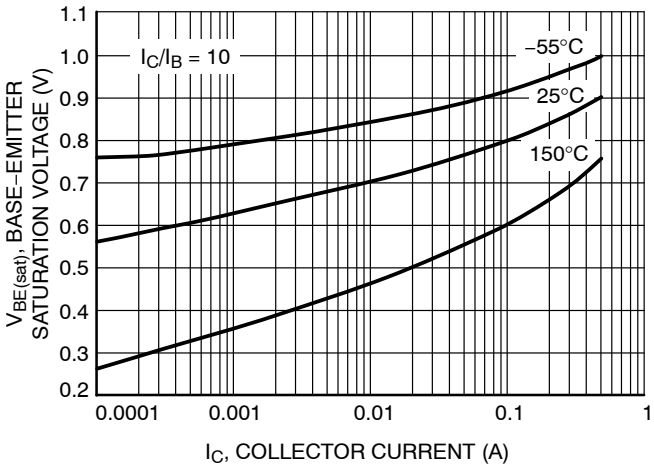

Figure 11. Base Emitter Saturation Voltage vs. Collector Current

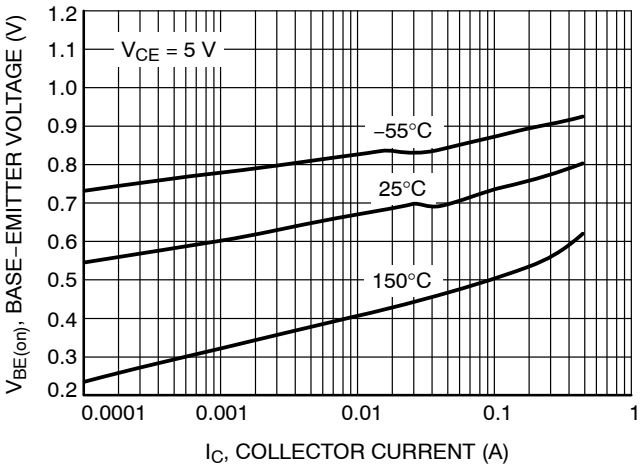

Figure 12. Base Emitter Voltage vs. Collector Current

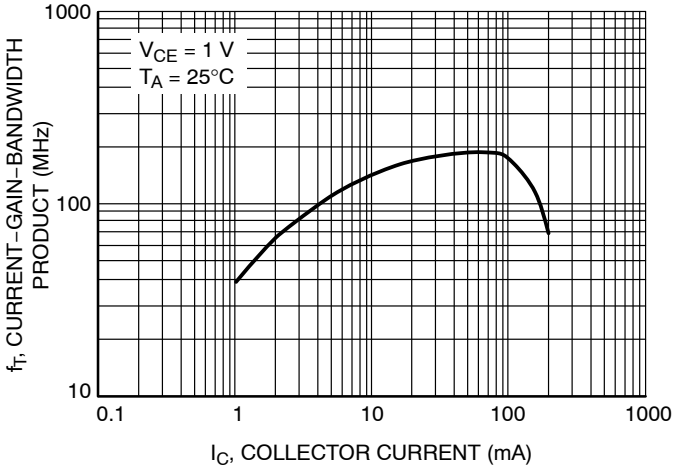

Figure 13. Current Gain Bandwidth Product vs. Collector Current

TYPICAL CHARACTERISTICS – BC817−25L, SBC81725L

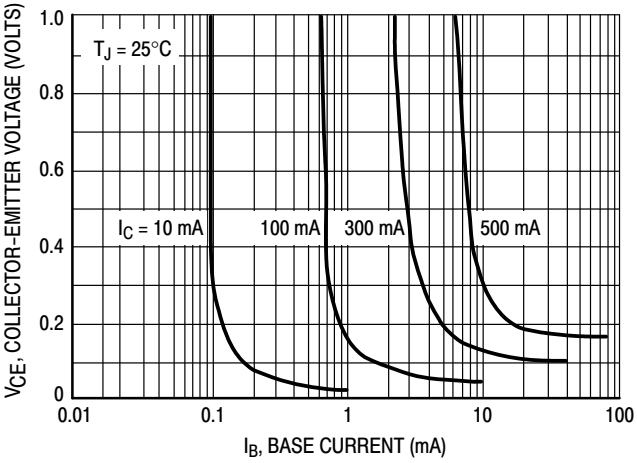

Figure 14. Saturation Region

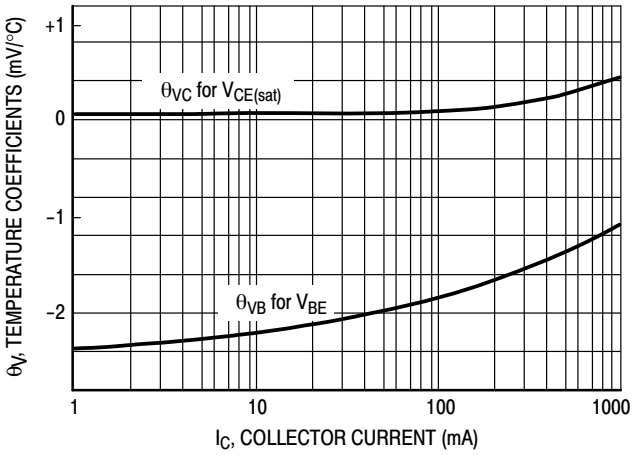

Figure 15. Temperature Coefficients

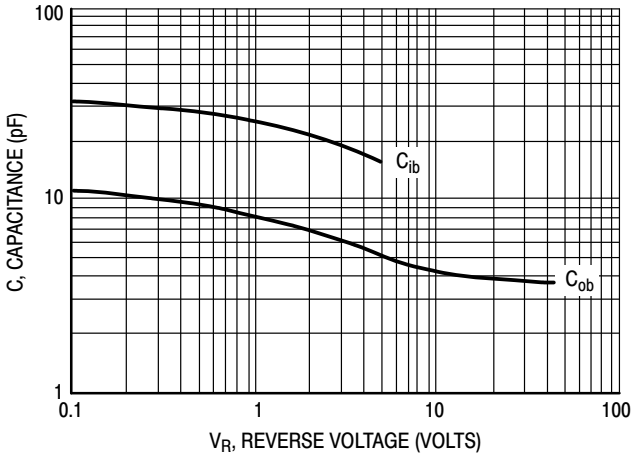

Figure 16. Capacitances

TYPICAL CHARACTERISTICS − BC817−40L, SBC817−40L

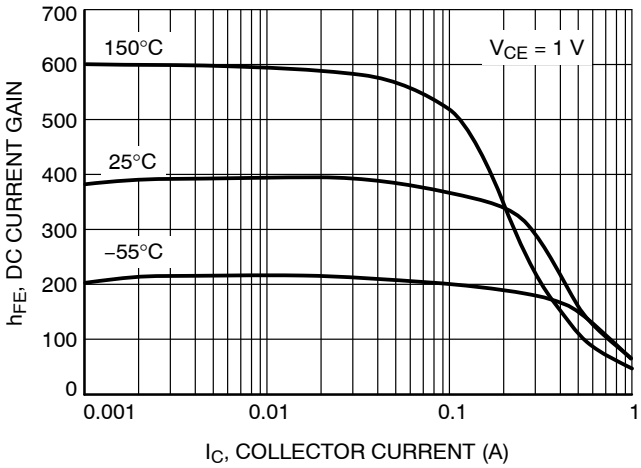

Figure 17. DC Current Gain vs. Collector Current

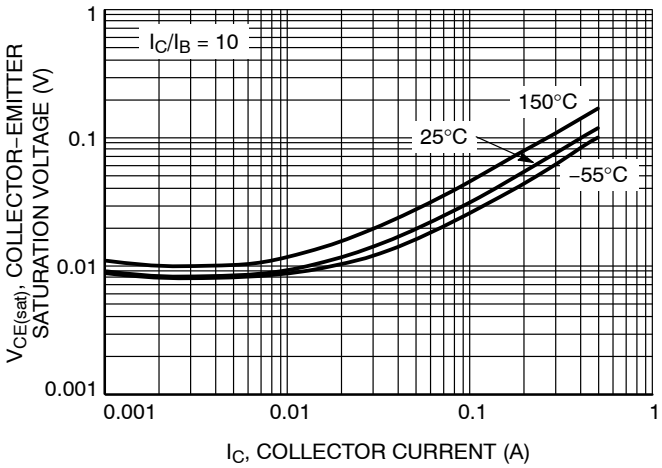

Figure 18. Collector Emitter Saturation Voltage vs. Collector Current

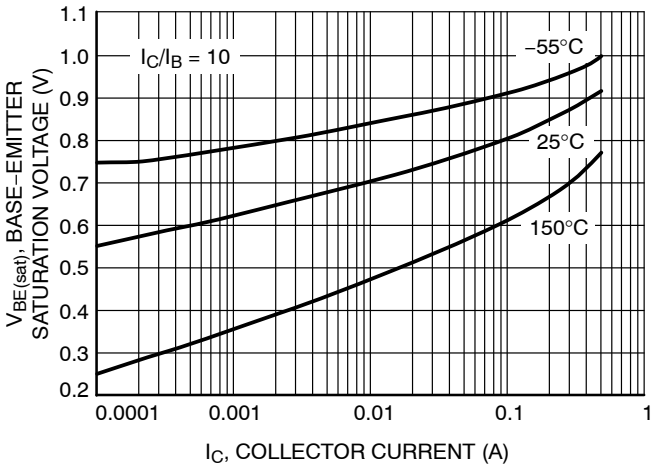

Figure 19. Base Emitter Saturation Voltage vs. Collector Current

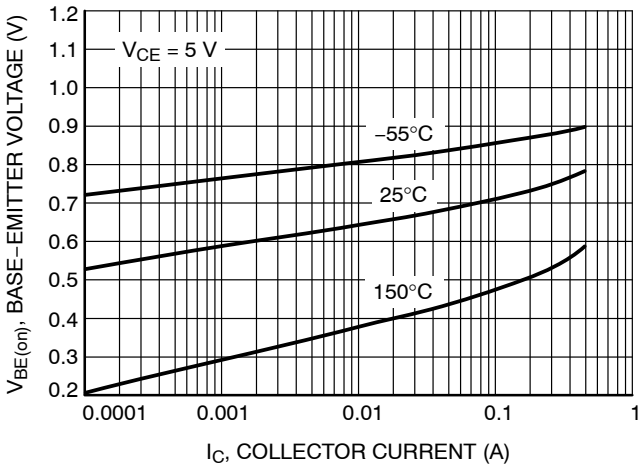

Figure 20. Base Emitter Voltage vs. Collector Current

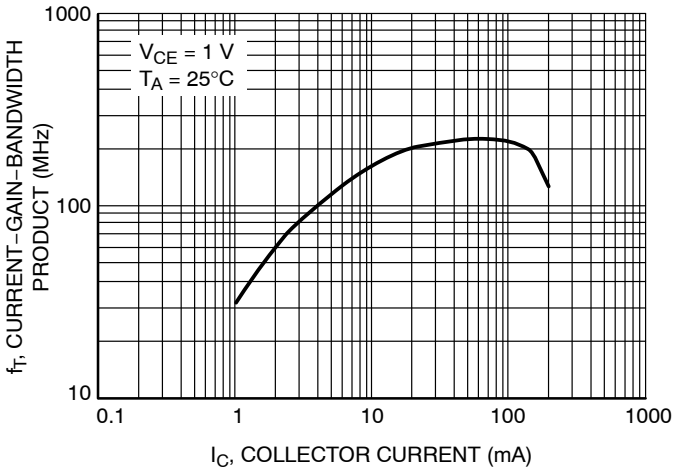

Figure 21. Current Gain Bandwidth Product vs. Collector Current

TYPICAL CHARACTERISTICS − BC817−40L, SBC817−40L

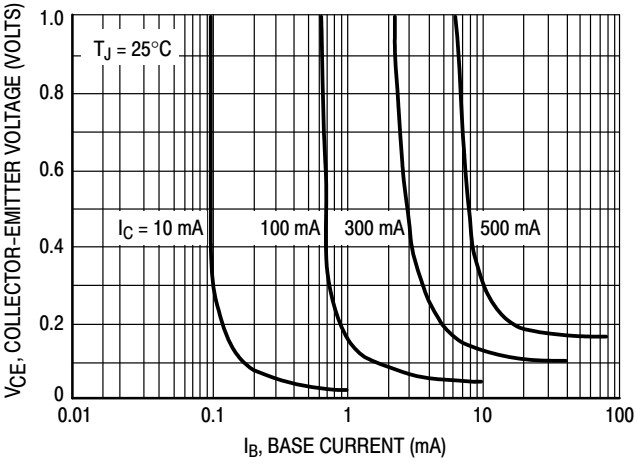

Figure 22. Saturation Region

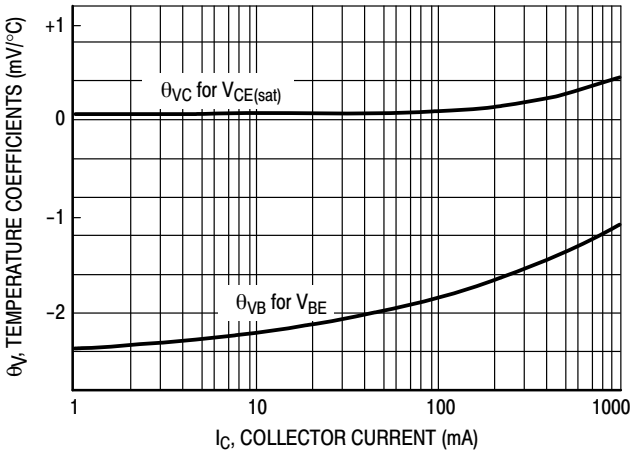

Figure 23. Temperature Coefficients

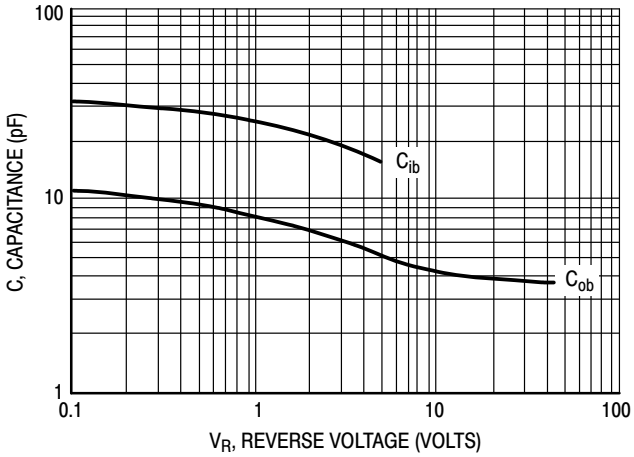

Figure 24. Capacitances

TYPICAL CHARACTERISTICS − BC817−16L, SBC817−16L, BC817−25L, SBC817−25L, BC817−40L, SBC817−40L

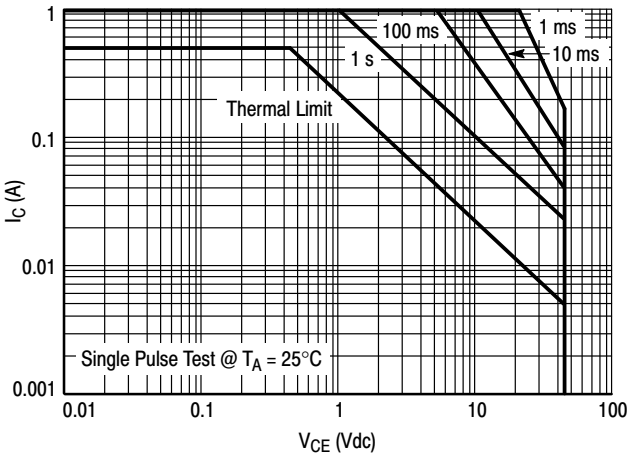

Figure 25. Safe Operating Area

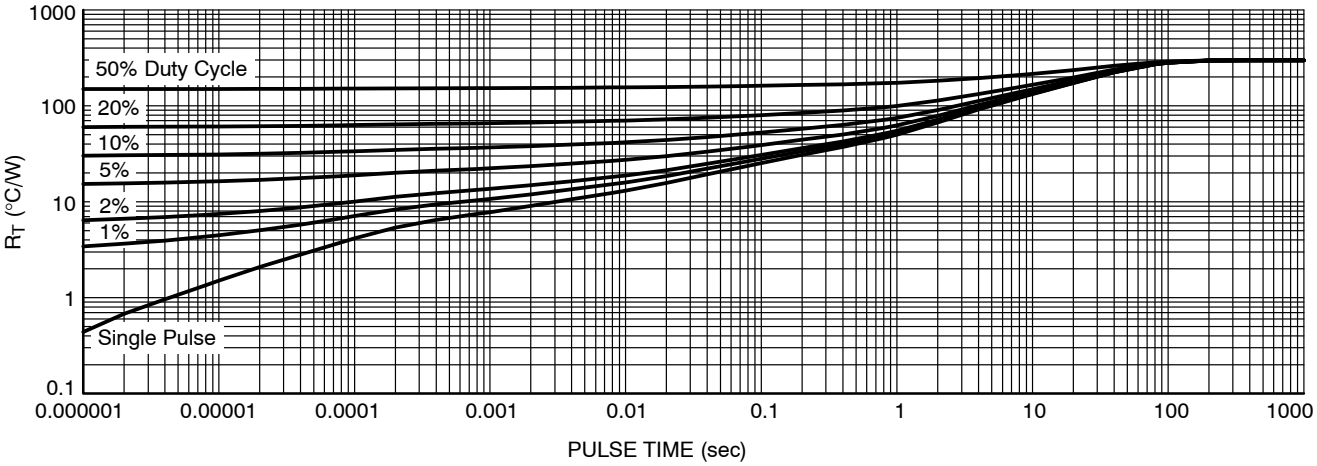

Figure 26. Thermal Response

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