

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

## General Purpose Transistors

### NPN Silicon

#### Features

- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### 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) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (Note 2) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

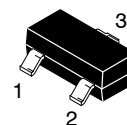
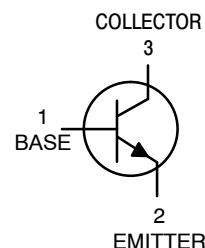
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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.



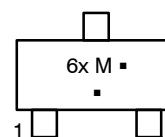
ON Semiconductor®

<http://onsemi.com>



SOT-23  
CASE 318  
STYLE 6

#### 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.

## BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector – Emitter Breakdown Voltage ( $I_C = 10\text{ mA}$ )	$V_{(BR)CEO}$	45	–	–	V
Collector – Emitter Breakdown Voltage ( $V_{EB} = 0, I_C = 10\ \mu\text{A}$ )	$V_{(BR)CES}$	50	–	–	V
Emitter – Base Breakdown Voltage ( $I_E = 1.0\ \mu\text{A}$ )	$V_{(BR)EBO}$	5.0	–	–	V
Collector Cutoff Current ( $V_{CB} = 20\text{ V}$ ) ( $V_{CB} = 20\text{ V}, T_A = 150^\circ\text{C}$ )	$I_{CBO}$	–	–	100 5.0	nA $\mu\text{A}$
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 100\text{ mA}, V_{CE} = 1.0\text{ V}$ )  ( $I_C = 500\text{ mA}, V_{CE} = 1.0\text{ V}$ )	$h_{FE}$	100 160 250 40	– – – –	250 400 600 –	–
Collector – Emitter Saturation Voltage ( $I_C = 500\text{ mA}, I_B = 50\text{ mA}$ )	$V_{CE(sat)}$	–	–	0.7	V
Base – Emitter On Voltage ( $I_C = 500\text{ mA}, V_{CE} = 1.0\text{ V}$ )	$V_{BE(on)}$	–	–	1.2	V
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current – Gain – Bandwidth Product ( $I_C = 10\text{ mA}, V_{CE} = 5.0\text{ Vdc}, f = 100\text{ MHz}$ )	$f_T$	100	–	–	MHz
Output Capacitance ( $V_{CB} = 10\text{ V}, f = 1.0\text{ MHz}$ )	$C_{obo}$	–	10	–	pF

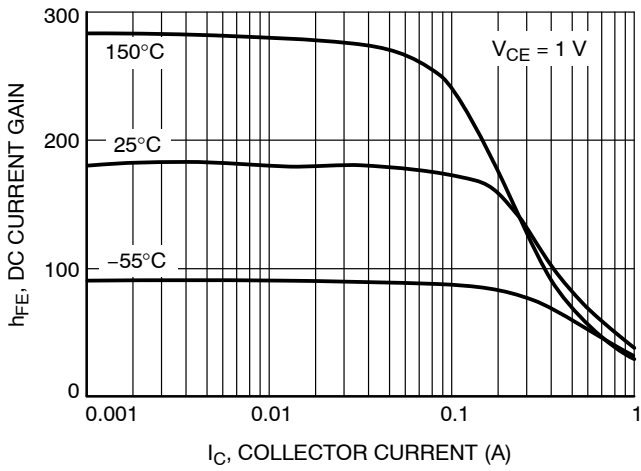
### ORDERING INFORMATION

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

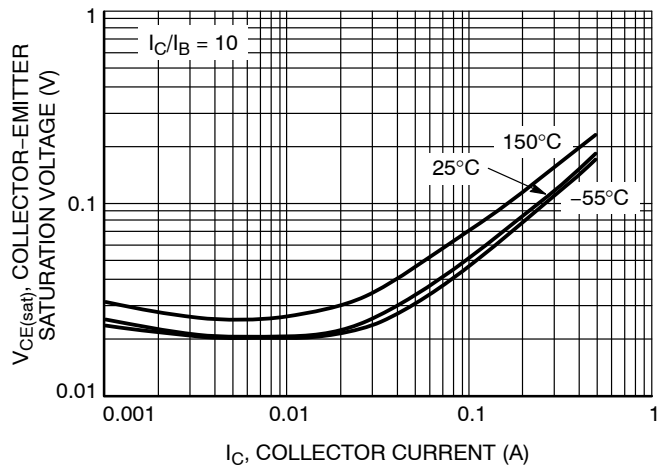
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

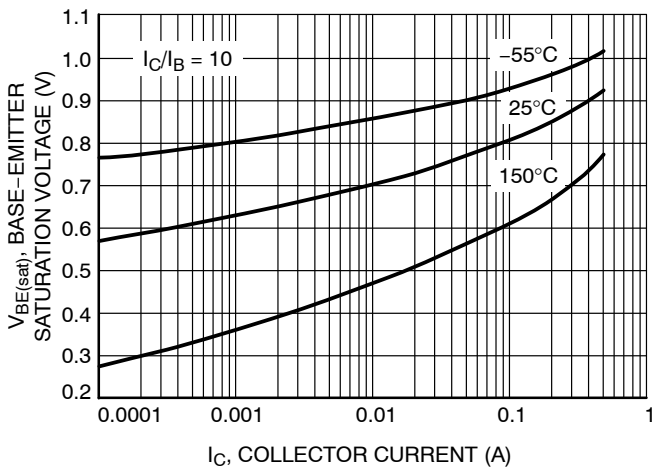
## TYPICAL CHARACTERISTICS - BC817-16LT1



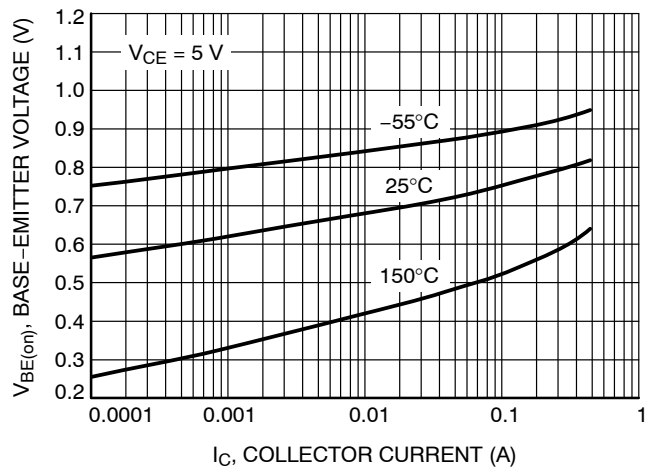
**Figure 1. DC Current Gain vs. Collector Current**



**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**

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

## TYPICAL CHARACTERISTICS - BC817-16LT1

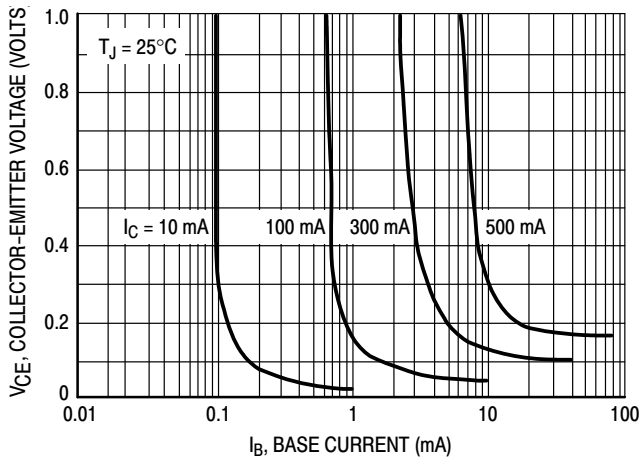


Figure 5. Saturation Region

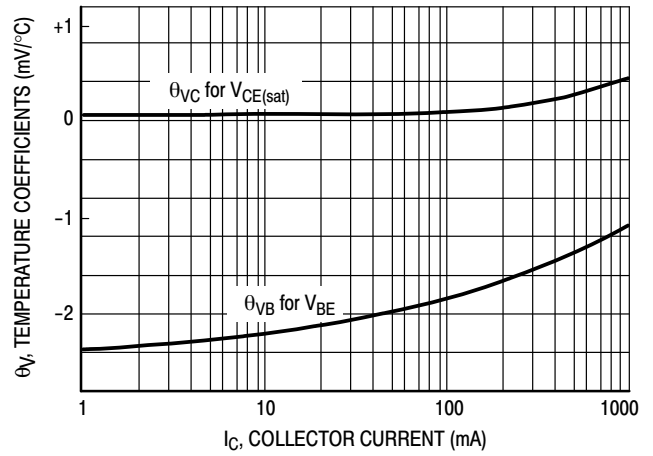


Figure 6. Temperature Coefficients

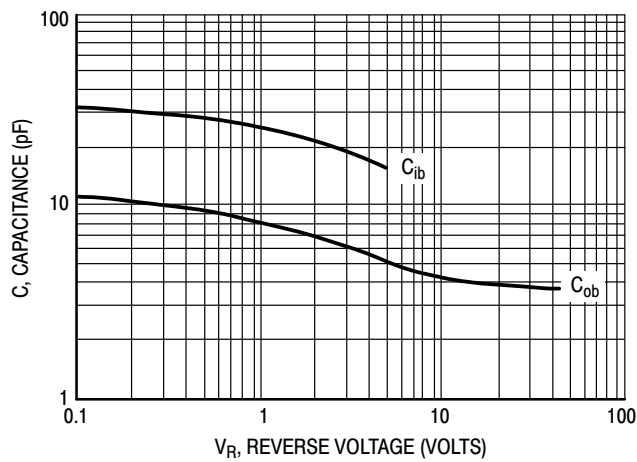


Figure 7. Capacitances

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

## TYPICAL CHARACTERISTICS - BC817-25LT1

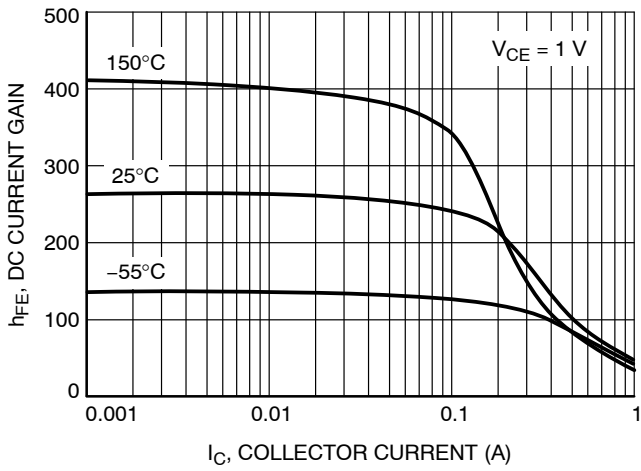


Figure 8. DC Current Gain vs. Collector Current

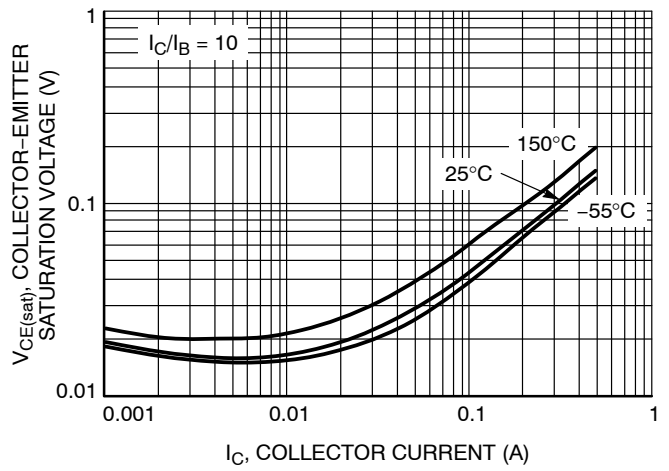


Figure 9. Collector Emitter Saturation Voltage vs. Collector Current

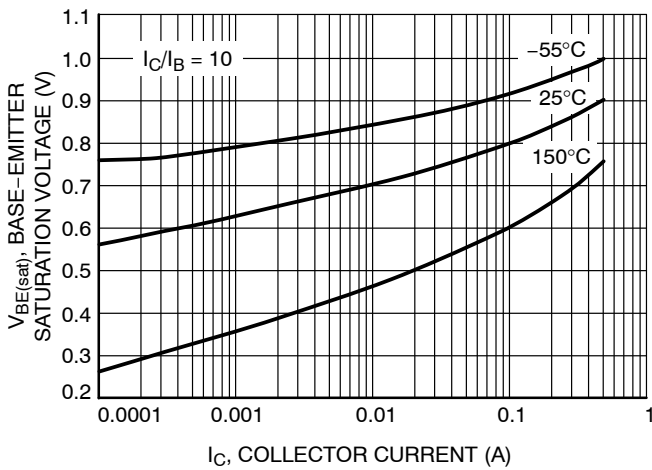


Figure 10. Base Emitter Saturation Voltage vs. Collector Current

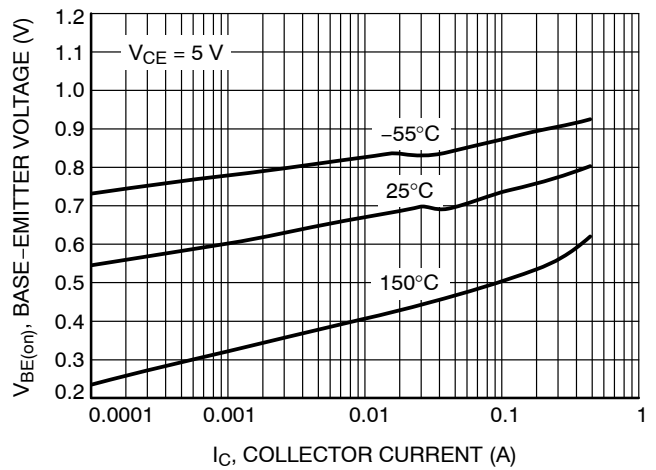


Figure 11. Base Emitter Voltage vs. Collector Current

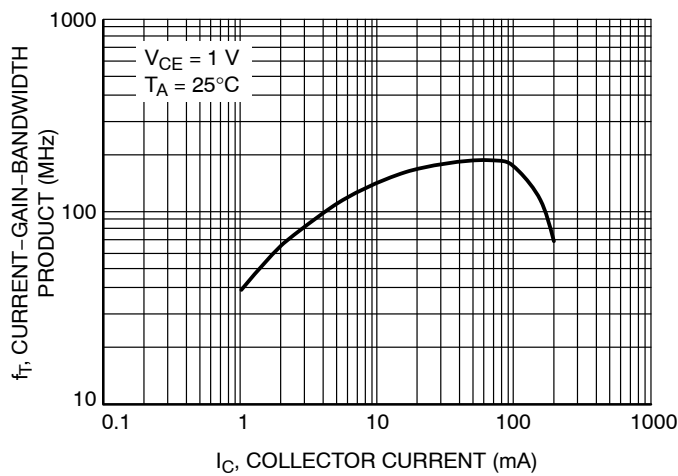


Figure 12. Current Gain Bandwidth Product vs. Collector Current

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

## TYPICAL CHARACTERISTICS - BC817-25LT1

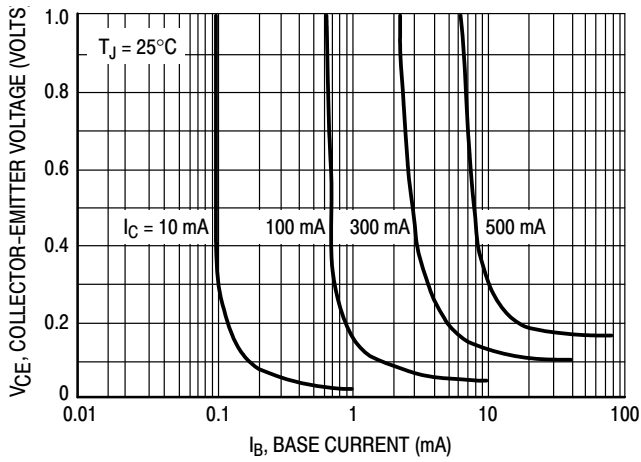


Figure 13. Saturation Region

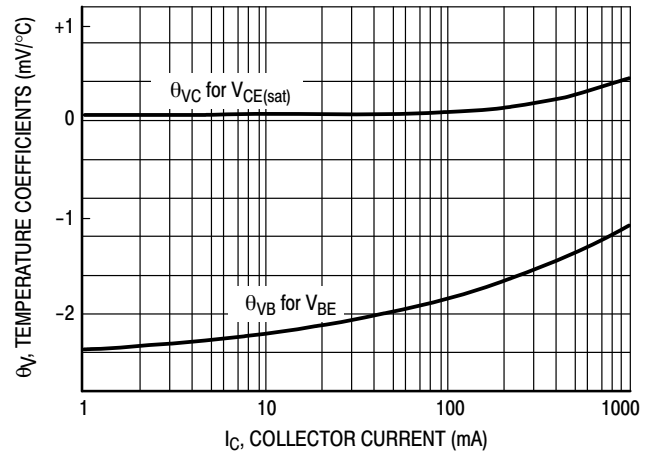


Figure 14. Temperature Coefficients

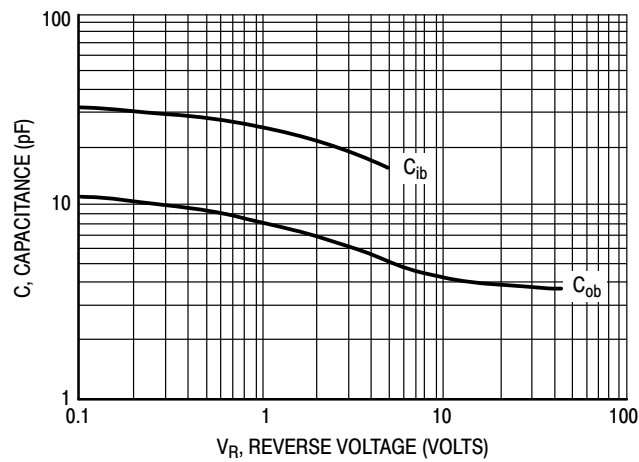
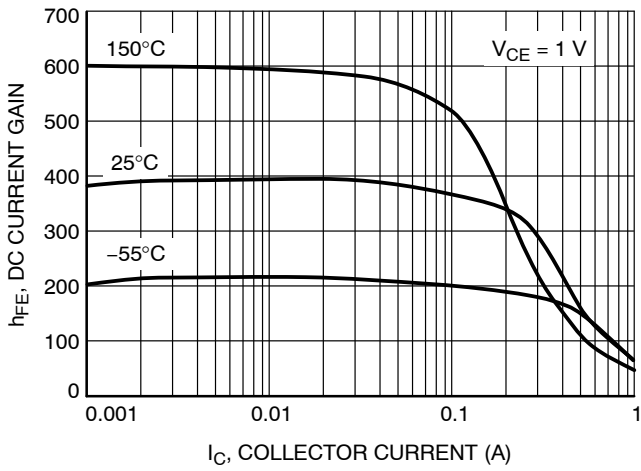


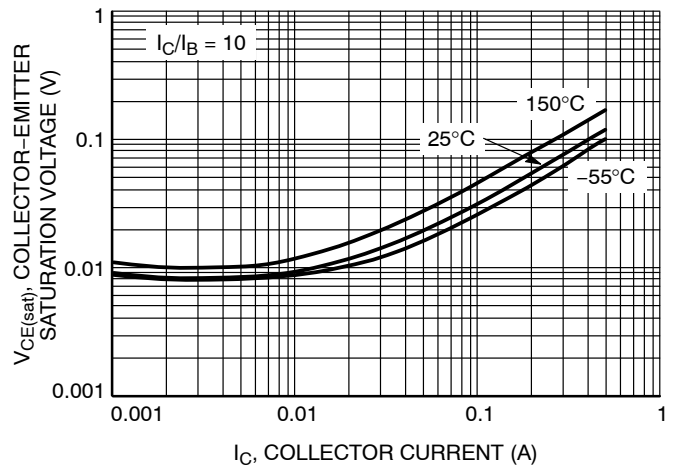
Figure 15. Capacitances

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

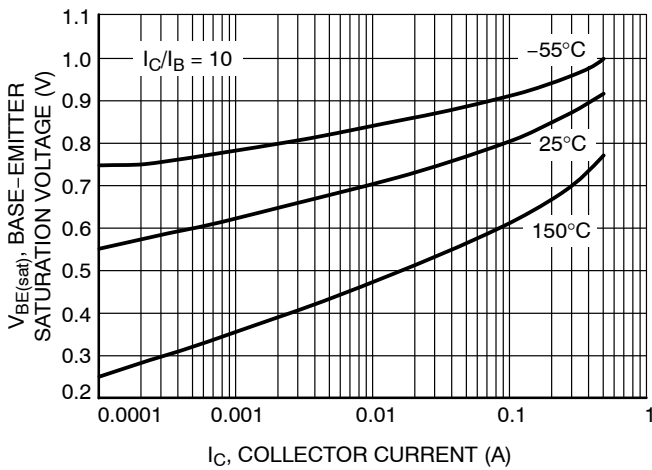
## TYPICAL CHARACTERISTICS - BC817-40LT1



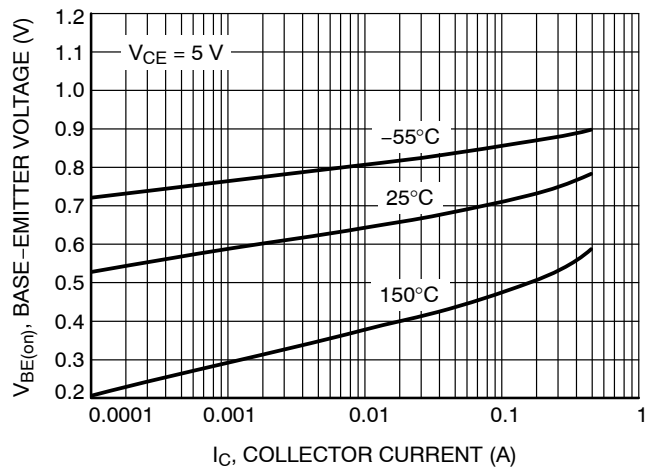
**Figure 16. DC Current Gain vs. Collector Current**



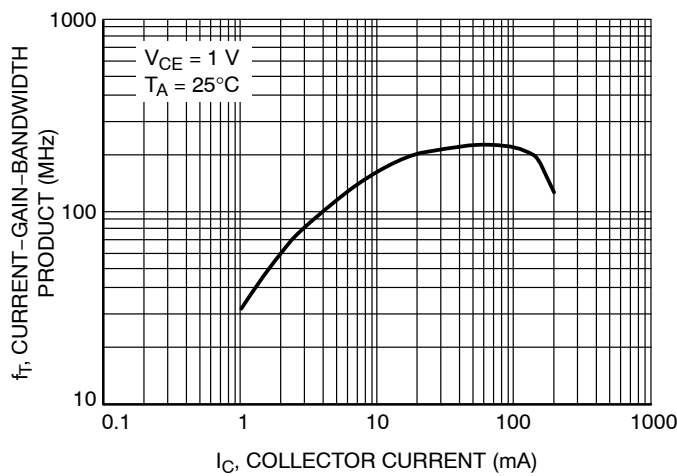
**Figure 17. Collector Emitter Saturation Voltage vs. Collector Current**



**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**

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

## TYPICAL CHARACTERISTICS - BC817-40LT1

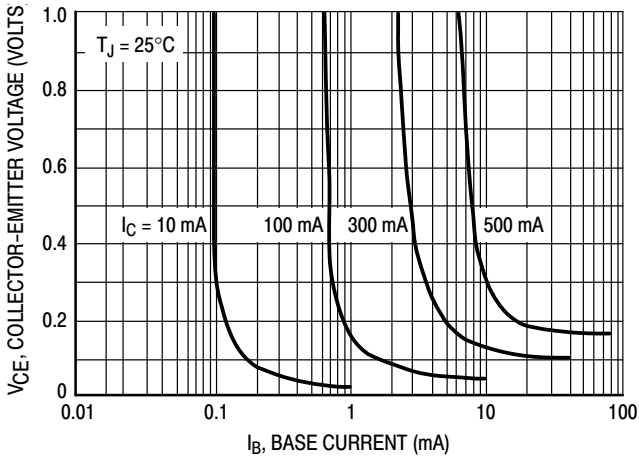


Figure 21. Saturation Region

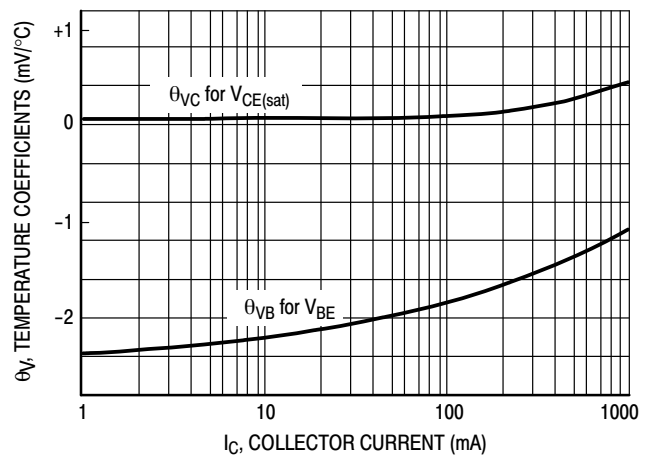


Figure 22. Temperature Coefficients

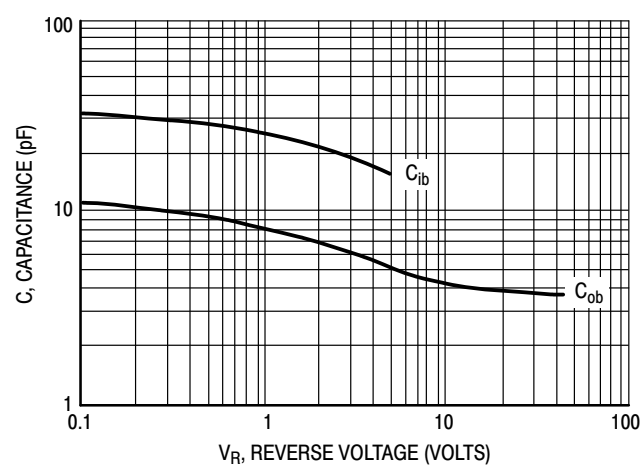


Figure 23. Capacitances



# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

## TYPICAL CHARACTERISTICS – BC817-16LT1, BC817-25LT1, BC817-40LT1

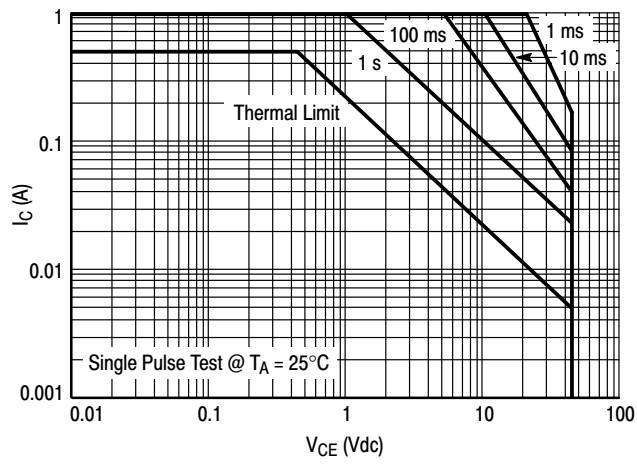
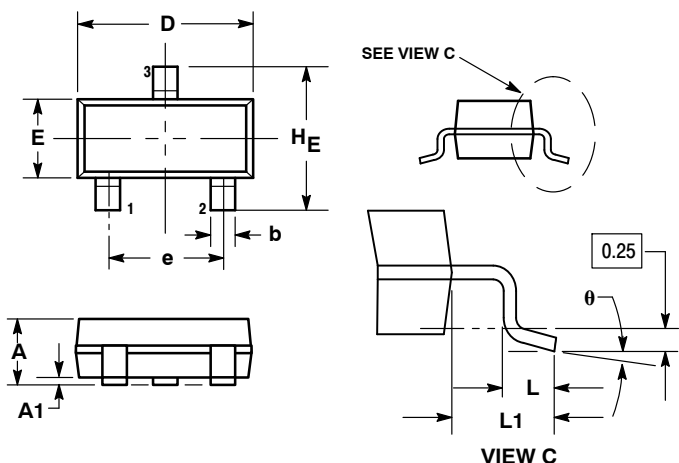


Figure 24. Safe Operating Area

# BC817-16LT1G, BC817-25LT1G, BC817-40LT1G

## PACKAGE DIMENSIONS

SOT-23 (TO-236)  
CASE 318-08  
ISSUE AN

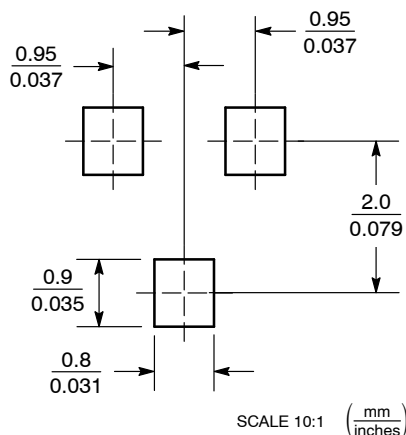


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
  4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104

STYLE 6:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR

### SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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