

# BC817-16LT1, BC817-25LT1, BC817-40LT1

## General Purpose Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available

#### 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	$^\circ\text{C}$

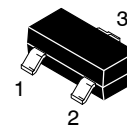
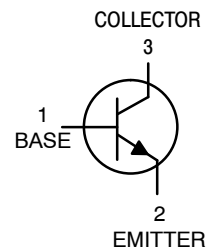
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

- FR-5 =  $1.0 \times 0.75 \times 0.062$  in.
- Alumina =  $0.4 \times 0.3 \times 0.024$  in 99.5% alumina.



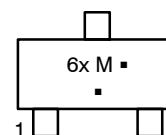
ON Semiconductor®

<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.

# BC817-16LT1, BC817-25LT1, BC817-40LT1

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -10 mA)	V <sub>(BR)CEO</sub>	45	-	-	V
Collector-Emitter Breakdown Voltage (V <sub>EB</sub> = 0, I <sub>C</sub> = -10 μA)	V <sub>(BR)CES</sub>	50	-	-	V
Emitter-Base Breakdown Voltage (I <sub>E</sub> = -1.0 μA)	V <sub>(BR)EBO</sub>	5.0	-	-	V
Collector Cutoff Current (V <sub>CB</sub> = 20 V) (V <sub>CB</sub> = 20 V, T <sub>A</sub> = 150°C)	I <sub>CBO</sub>	-	-	100 5.0	nA μA

## ON CHARACTERISTICS

DC Current Gain (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 1.0 V)	BC817-16 BC817-25 BC817-40	h <sub>FE</sub>	100	-	250	-
(I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 1.0 V)			160	-	400	-
			250	-	600	-
			40	-	-	-
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA)		V <sub>CE(sat)</sub>	-	-	0.7	V
Base-Emitter On Voltage (I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 1.0 V)		V <sub>BE(on)</sub>	-	-	1.2	V

## SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 Vdc, f = 100 MHz)	f <sub>T</sub>	100	-	-	MHz
Output Capacitance (V <sub>CB</sub> = 10 V, f = 1.0 MHz)	C <sub>obo</sub>	-	10	-	pF

## ORDERING INFORMATION

Device	Specific Marking	Package	Shipping <sup>†</sup>
BC817-16LT1	6A	SOT-23	3000/Tape & Reel
BC817-16LT1G		SOT-23 (Pb-Free)	3000/Tape & Reel
BC817-16LT3		SOT-23	10,000/Tape & Reel
BC817-16LT3G		SOT-23 (Pb-Free)	10,000/Tape & Reel
BC817-25LT1	6B	SOT-23	3000/Tape & Reel
BC817-25LT1G		SOT-23 (Pb-Free)	3000/Tape & Reel
BC817-25LT3		SOT-23	10,000/Tape & Reel
BC817-25LT3G		SOT-23 (Pb-Free)	10,000/Tape & Reel
BC817-40LT1	6C	SOT-23	3000/Tape & Reel
BC817-40LT1G		SOT-23 (Pb-Free)	3000/Tape & Reel
BC817-40LT3		SOT-23	10,000/Tape & Reel
BC817-40LT3G		SOT-23 (Pb-Free)	10,000/Tape & Reel
SBC817-40LT1		SOT-23	3000/Tape & Reel
SBC817-40LT1G		SOT-23 (Pb-Free)	3000/Tape & Reel
SBC817-40LT3		SOT-23	10,000/Tape & Reel
SBC817-40LT3G		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.

BC817-16LT1, BC817-25LT1, BC817-40LT1

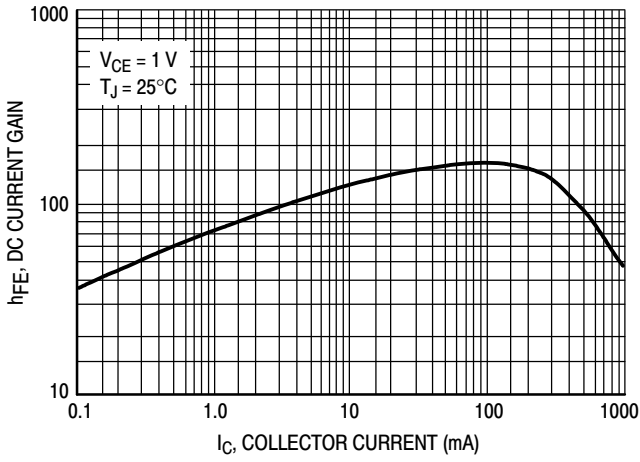


Figure 1. DC Current Gain

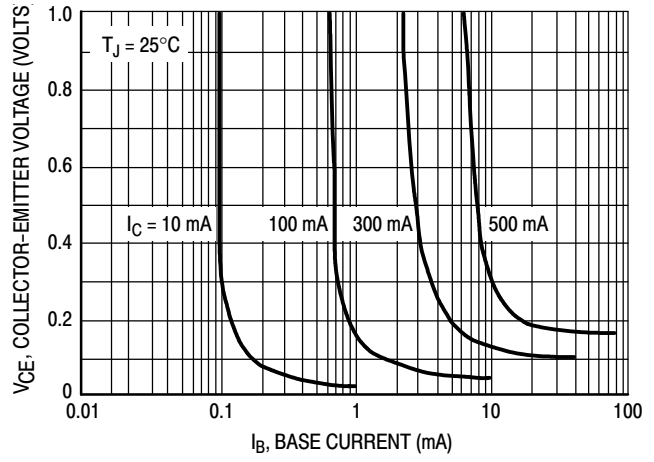


Figure 2. Saturation Region

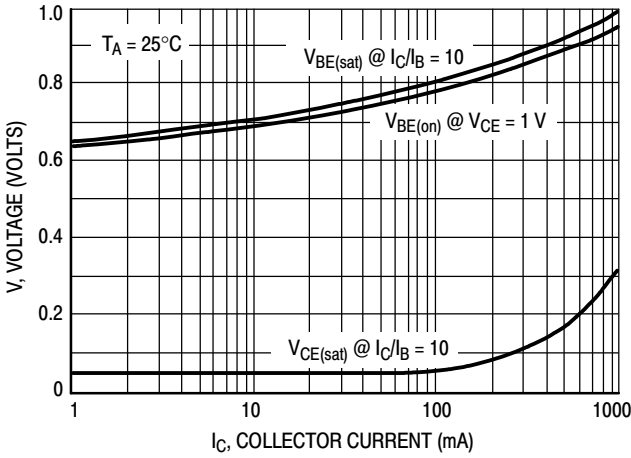


Figure 3. "On" Voltages

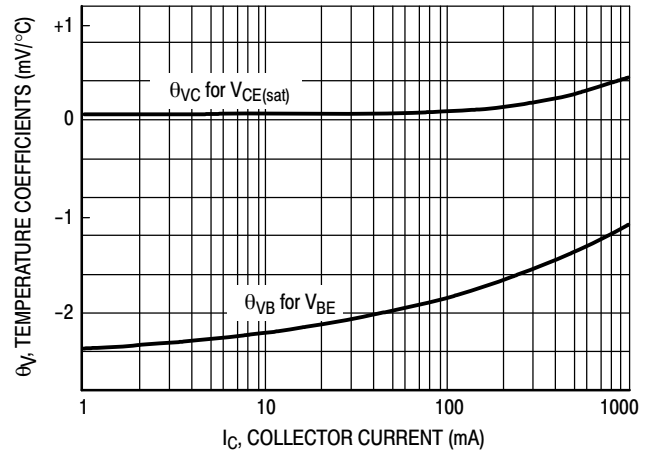


Figure 4. Temperature Coefficients

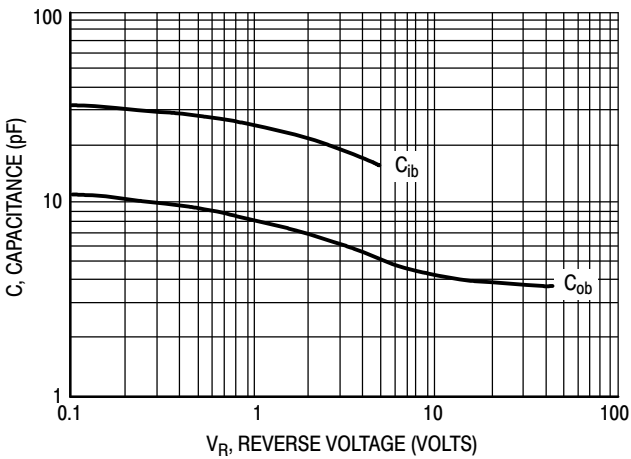


Figure 5. Capacitances

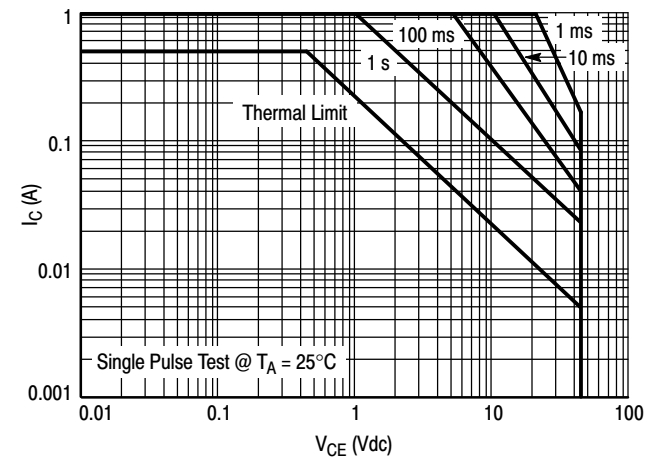
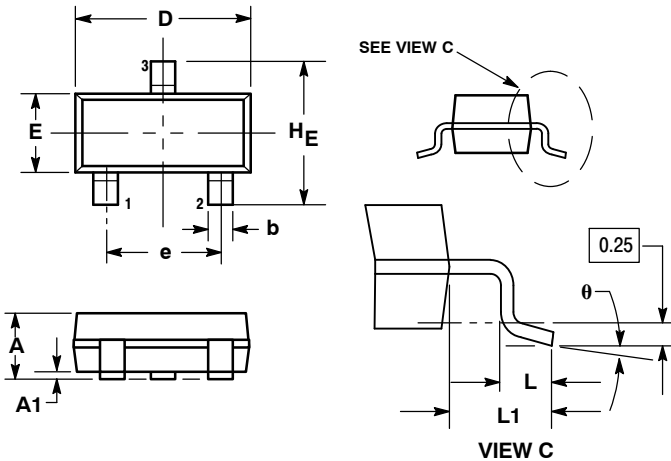


Figure 6. BC817-40L Safe Operating Area

# BC817-16LT1, BC817-25LT1, BC817-40LT1

## PACKAGE DIMENSIONS

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

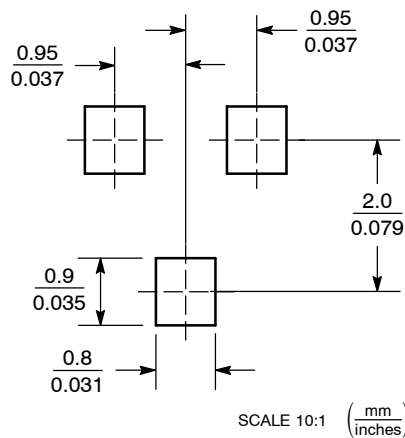


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
  4. 318-01 THRU -07 AND -09 OBSOLETE, NEW STANDARD 318-08.

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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