

# 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   | mA   |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

#### THERMAL CHARACTERISTICS

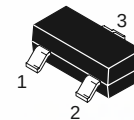
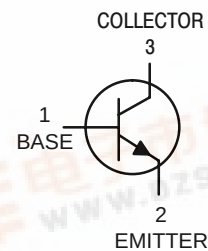
| Characteristic                                                                                                      | Symbol          | Max            | Unit                       |
|---------------------------------------------------------------------------------------------------------------------|-----------------|----------------|--------------------------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

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



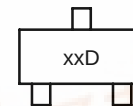
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SOT-23  
CASE 318  
STYLE 6

#### MARKING DIAGRAM



xx = Specific Device Code  
D = Date Code

#### 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 |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

## OFF CHARACTERISTICS

|                                                                                                                    |               |        |        |            |                     |
|--------------------------------------------------------------------------------------------------------------------|---------------|--------|--------|------------|---------------------|
| Collector-Emitter Breakdown Voltage<br>( $I_C = -10 \text{ mA}$ )                                                  | $V_{(BR)CEO}$ | 45     | –      | –          | V                   |
| Collector-Emitter Breakdown Voltage<br>( $V_{EB} = 0$ , $I_C = -10 \text{ }\mu\text{A}$ )                          | $V_{(BR)CES}$ | 50     | –      | –          | V                   |
| Emitter-Base Breakdown Voltage<br>( $I_E = -1.0 \text{ }\mu\text{A}$ )                                             | $V_{(BR)EBO}$ | 5.0    | –      | –          | V                   |
| Collector Cutoff Current<br>( $V_{CB} = 20 \text{ V}$ )<br>( $V_{CB} = 20 \text{ V}$ , $T_A = 150^\circ\text{C}$ ) | $I_{CBO}$     | –<br>– | –<br>– | 100<br>5.0 | nA<br>$\mu\text{A}$ |

## ON CHARACTERISTICS

|                                                                                                                                                                   |               |                         |                  |                        |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------|------------------|------------------------|---|
| DC Current Gain<br>( $I_C = 100\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ )<br>BC817-16<br>BC817-25<br>BC817-40<br>( $I_C = 500\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ ) | $h_{FE}$      | 100<br>160<br>250<br>40 | –<br>–<br>–<br>– | 250<br>400<br>600<br>– | – |
| Collector–Emitter Saturation Voltage<br>( $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$ )                                                                          | $V_{CE(sat)}$ | –                       | –                | 0.7                    | V |
| Base–Emitter On Voltage<br>( $I_C = 500\text{ mA}$ , $V_{CE} = 1.0\text{ V}$ )                                                                                    | $V_{BE(on)}$  | –                       | –                | 1.2                    | V |

## SMALL-SIGNAL CHARACTERISTICS

|                                                                                                               |           |     |    |   |     |
|---------------------------------------------------------------------------------------------------------------|-----------|-----|----|---|-----|
| Current-Gain-Bandwidth Product<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 100\text{ MHz}$ ) | $f_T$     | 100 | –  | – | MHz |
| Output Capacitance<br>( $V_{CB} = 10\text{ V}$ , $f = 1.0\text{ MHz}$ )                                       | $C_{obo}$ | –   | 10 | – | pF  |

## ORDERING INFORMATION

| Device       | Specific Marking Code | Package             | Shipping <sup>†</sup> |
|--------------|-----------------------|---------------------|-----------------------|
| BC817-16LT1  | 6A                    | SOT-23              | 3,000 / Tape & Reel   |
| BC817-16LT1G | 6A                    | SOT-23<br>(Pb-Free) |                       |
| BC817-16LT3  | 6A                    | SOT-23              | 10,000 / Tape & Reel  |
| BC817-25LT1  | 6B                    | SOT-23              | 3,000 / Tape & Reel   |
| BC817-25LT1G | 6B                    | SOT-23<br>(Pb-Free) |                       |
| BC817-25LT3  | 6B                    | SOT-23              | 10,000 / Tape & Reel  |
| BC817-25LT3G | 6B                    | SOT-23<br>(Pb-Free) |                       |
| BC817-40LT1  | 6C                    | SOT-23              | 3,000 / Tape & Reel   |
| BC817-40LT1G | 6C                    | SOT-23<br>(Pb-Free) |                       |
| BC817-40LT3  | 6C                    | SOT-23              | 10,000 / Tape & Reel  |
| BC817-40LT3G | 6C                    | SOT-23<br>(Pb-Free) |                       |
| SBC817-40LT1 | 6C                    | SOT-23              | 3,000 / Tape & Reel   |
| SBC817-40LT3 | 6C                    | SOT-23              | 10,000 / Tape & Reel  |

†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

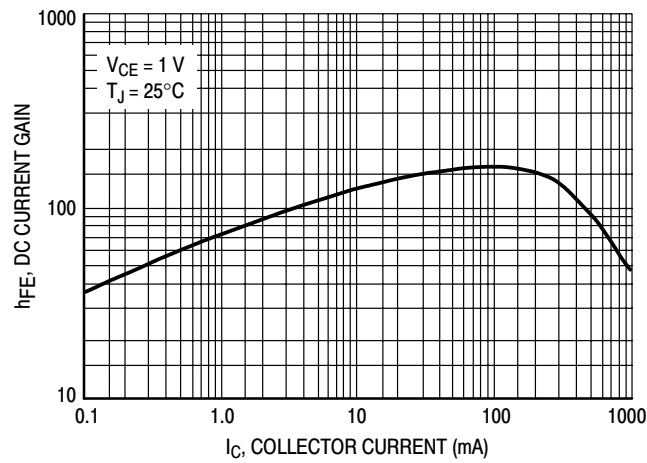


Figure 1. DC Current Gain

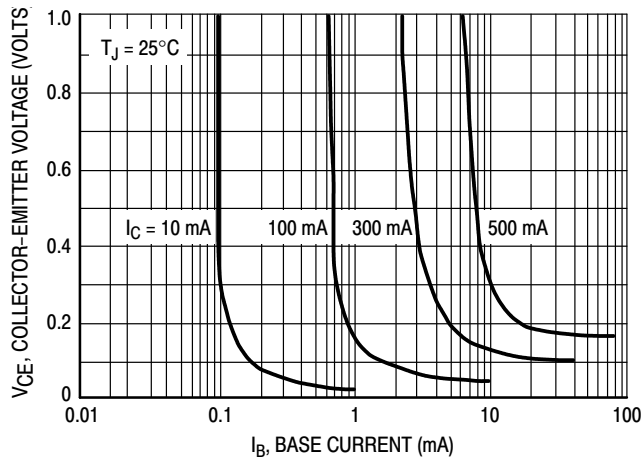


Figure 2. Saturation Region

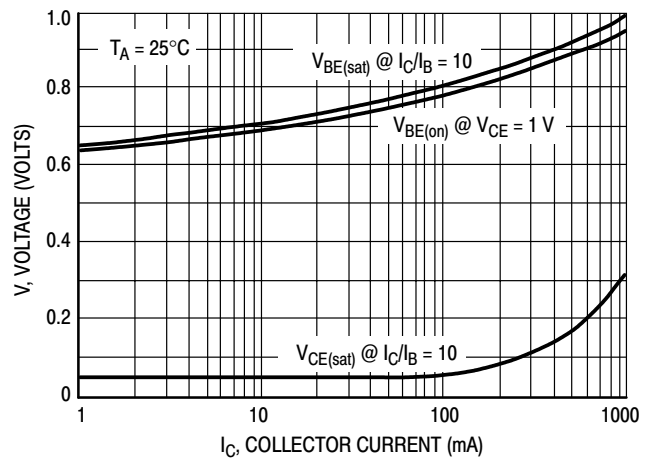


Figure 3. "On" Voltages

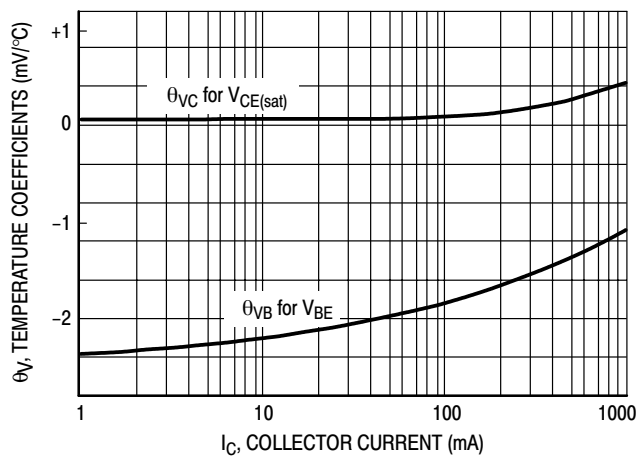


Figure 4. Temperature Coefficients

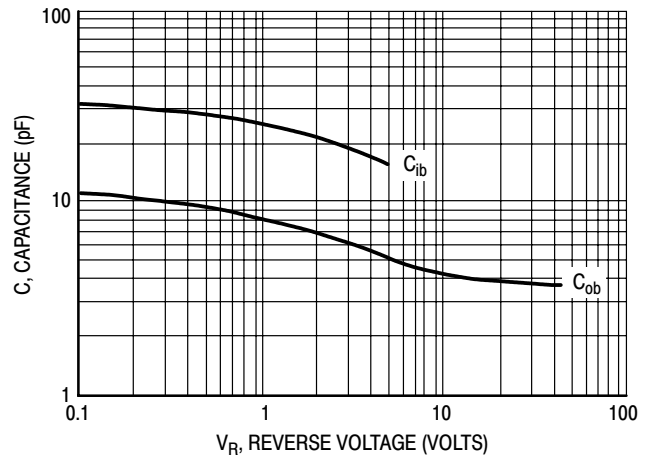


Figure 5. Capacitances

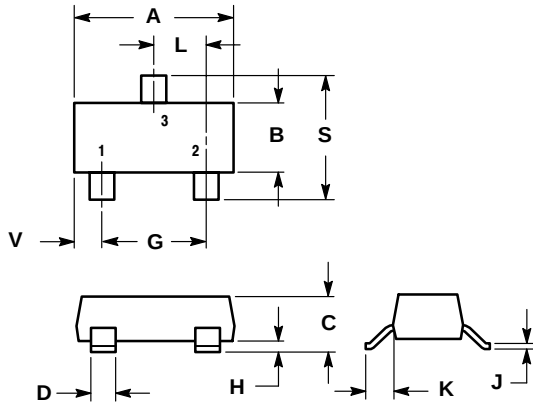
# BC817-16LT1, BC817-25LT1, BC817-40LT1

## PACKAGE DIMENSIONS

### SOT-23 (TO-236)

CASE 318-09

ISSUE AI



#### NOTES:

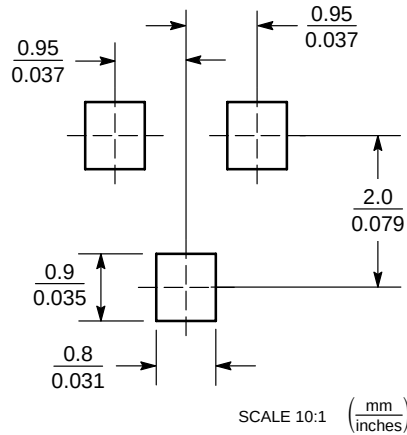
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318-01, -02, AND -06 OBSOLETE, NEW STANDARD 318-09.

| 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   | 0.0385 | 0.0498 | 0.99        | 1.26  |
| D   | 0.0140 | 0.0200 | 0.36        | 0.50  |
| G   | 0.0670 | 0.0826 | 1.70        | 2.10  |
| H   | 0.0040 | 0.0098 | 0.10        | 0.25  |
| J   | 0.0034 | 0.0070 | 0.085       | 0.177 |
| K   | 0.0180 | 0.0236 | 0.45        | 0.60  |
| L   | 0.0350 | 0.0401 | 0.89        | 1.02  |
| S   | 0.0830 | 0.0984 | 2.10        | 2.50  |
| V   | 0.0177 | 0.0236 | 0.45        | 0.60  |

#### STYLE 6:

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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