

# General Purpose Transistors

**Voltage and Current are Negative for PNP Transistors**

**BCX17LT1G, PNP**  
**BCX18LT1G, PNP**  
**BCX19LT1G, NPN**  
**SBCX19LT1G, NPN**

## Features

- S and NSV Prefix 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

## MAXIMUM RATINGS

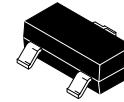
| Symbol    | Rating   | Value    | Unit |
|-----------|--|----------|------|
| $V_{CEO}$ | Collector – Emitter Voltage<br>BCX17, BCX19<br>BCX18 | 45<br>25 | Vdc  |
| $V_{CBO}$ | Collector – Base Voltage<br>BCX17, BCX19<br>BCX18    | 50<br>30 | Vdc  |
| $V_{EBO}$ | Emitter – Base Voltage                               | 5.0      | Vdc  |
| $I_C$     | Collector Current – Continuous                       | 500      | mAdc |

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.

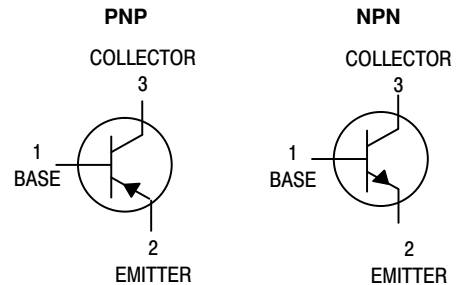
## THERMAL CHARACTERISTICS

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

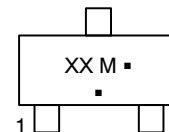
1. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.
2. Alumina =  $0.4 \times 0.3 \times 0.024$  in 99.5% alumina.



SOT-23  
(TO-236)  
CASE 318  
STYLE 6



## MARKING DIAGRAM



XX = T1, T2 or U1  
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 4 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 4.

# BCX17LT1G, PNP BCX18LT1G, PNP BCX19LT1G, NPN SBCX19LT1G, NPN

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

| Symbol | Characteristic | Min | Typ | Max | Unit |
|--------|----------------|-----|-----|-----|------|
|--------|----------------|-----|-----|-----|------|

### OFF CHARACTERISTICS

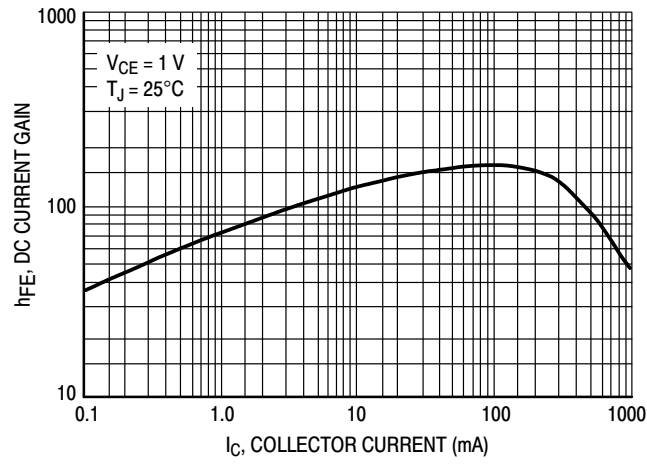
|                      |  |          |        |            |              |
|----------------------|--|----------|--------|------------|--------------|
| V <sub>(BR)CEO</sub> | Collector–Emitter Breakdown Voltage<br>(I <sub>C</sub> = 10 mAdc, I <sub>B</sub> = 0)<br>BCX17, BCX19, SBCX19<br>BCX18                               | 45<br>25 | –<br>– | –<br>–     | Vdc          |
| V <sub>(BR)CES</sub> | Collector–Emitter Breakdown Voltage<br>(I <sub>C</sub> = 10 µAdc, I <sub>C</sub> = 0)<br>BCX17, BCX19, SBCX19<br>BCX18                               | 50<br>30 | –<br>– | –<br>–     | Vdc          |
| I <sub>CBO</sub>     | Collector Cutoff Current<br>(V <sub>CB</sub> = 20 Vdc, I <sub>E</sub> = 0)<br>(V <sub>CB</sub> = 20 Vdc, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C) | –<br>–   | –<br>– | 100<br>5.0 | nAdc<br>µAdc |
| I <sub>EBO</sub>     | Emitter Cutoff Current<br>(V <sub>EB</sub> = 5.0 Vdc, I <sub>C</sub> = 0)  | –        | –      | 10         | µAdc         |

### ON CHARACTERISTICS

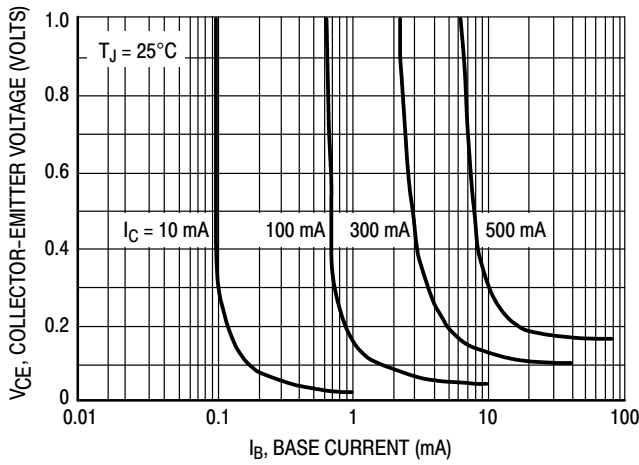
|                      |   |                 |             |               |     |
|----------------------|---|-----------------|-------------|---------------|-----|
| h <sub>FE</sub>      | DC Current Gain<br>(I <sub>C</sub> = 100 mAdc, V <sub>CE</sub> = 1.0 Vdc)<br>(I <sub>C</sub> = 300 mAdc, V <sub>CE</sub> = 1.0 Vdc)<br>(I <sub>C</sub> = 500 mAdc, V <sub>CE</sub> = 1.0 Vdc) | 100<br>70<br>40 | –<br>–<br>– | 600<br>–<br>– | –   |
| V <sub>CE(sat)</sub> | Collector–Emitter Saturation Voltage<br>(I <sub>C</sub> = 500 mAdc, I <sub>B</sub> = 50 mAdc)   | –               | –           | 0.62          | Vdc |
| V <sub>BE(on)</sub>  | Base–Emitter On Voltage<br>(I <sub>C</sub> = 500 mAdc, V <sub>CE</sub> = 1.0 Vdc)   | –               | –           | 1.2           | Vdc |

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.

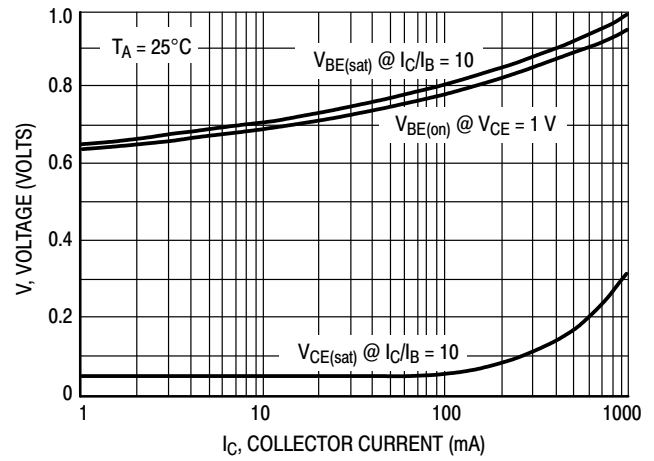
**BCX17LT1G, PNP BCX18LT1G, PNP BCX19LT1G, NPN SBCX19LT1G, NPN**



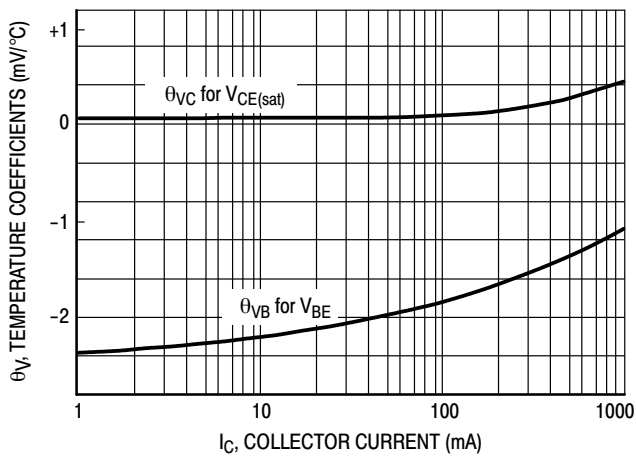
**Figure 1. DC Current Gain**



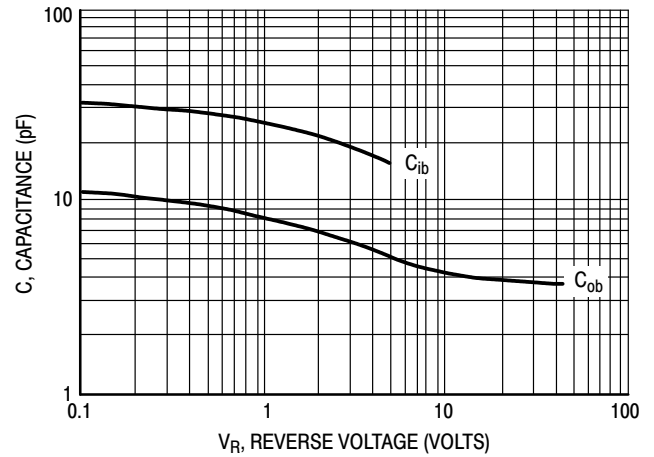
**Figure 2. Saturation Region**



**Figure 3. "On" Voltages**



**Figure 4. Temperature Coefficients**



**Figure 5. Capacitances**

## BCX17LT1G, PNP BCX18LT1G, PNP BCX19LT1G, NPN SBCX19LT1G, NPN

### ORDERING INFORMATION

| Device        | Specific Marking | Package             | Shipping†           |
|---------------|------------------|---------------------|---------------------|
| BCX17LT1G     | T1               | SOT-23<br>(Pb-Free) | 3,000 / Tape & Reel |
| NSVBCX17LT1G* | T1               | SOT-23<br>(Pb-Free) | 3,000 / Tape & Reel |
| BCX19LT1G     | U1               | SOT-23<br>(Pb-Free) | 3,000 / Tape & Reel |
| SBCX19LT1G*   | U1               | SOT-23<br>(Pb-Free) | 3,000 / Tape & Reel |

### DISCONTINUED (Note 3)

|           |    |                     |                     |
|-----------|----|---------------------|---------------------|
| BCX18LT1G | T2 | SOT-23<br>(Pb-Free) | 3,000 / 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](#).

\*S and NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

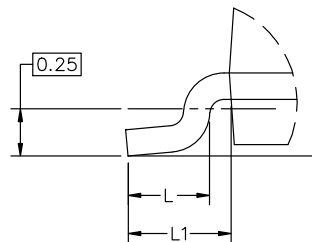
3. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on [www.onsemi.com](http://www.onsemi.com).



SCALE 4:1

**SOT-23 (TO-236) 2.90x1.30x1.00 1.90P**  
**CASE 318**  
**ISSUE AU**

DATE 14 AUG 2024



| MILLIMETERS |      |      |      |
|-------------|------|------|------|
| DIM         | MIN  | NOM  | MAX  |
| A           | 0.89 | 1.00 | 1.11 |
| A1          | 0.01 | 0.06 | 0.10 |
| b           | 0.37 | 0.44 | 0.50 |
| c           | 0.08 | 0.14 | 0.20 |
| D           | 2.80 | 2.90 | 3.04 |
| E           | 1.20 | 1.30 | 1.40 |
| e           | 1.78 | 1.90 | 2.04 |
| L           | 0.30 | 0.43 | 0.55 |
| L1          | 0.35 | 0.54 | 0.69 |
| HE          | 2.10 | 2.40 | 2.64 |
| T           | 0°   | ---  | 10°  |

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

**GENERIC MARKING DIAGRAM\***



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



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

**STYLES ON PAGE 2**

|                         |   |   |
|-------------------------|---|---|
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**SOT-23 (TO-236) 2.90x1.30x1.00 1.90P**  
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DATE 14 AUG 2024

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| STYLE 1 THRU 5:<br>CANCELLED                            | STYLE 6:<br>PIN 1. BASE<br>2. EMITTER<br>3. COLLECTOR | STYLE 7:<br>PIN 1. EMITTER<br>2. BASE<br>3. COLLECTOR       | STYLE 8:<br>PIN 1. ANODE<br>2. NO CONNECTION<br>3. CATHODE  |   |   |
| STYLE 9:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE      | STYLE 10:<br>PIN 1. DRAIN<br>2. SOURCE<br>3. GATE     | STYLE 11:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE-ANODE | STYLE 12:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. ANODE       | STYLE 13:<br>PIN 1. SOURCE<br>2. DRAIN<br>3. GATE           | STYLE 14:<br>PIN 1. CATHODE<br>2. GATE<br>3. ANODE          |
| STYLE 15:<br>PIN 1. GATE<br>2. CATHODE<br>3. ANODE      | STYLE 16:<br>PIN 1. ANODE<br>2. CATHODE<br>3. CATHODE | STYLE 17:<br>PIN 1. NO CONNECTION<br>2. ANODE<br>3. CATHODE | STYLE 18:<br>PIN 1. NO CONNECTION<br>2. CATHODE<br>3. ANODE | STYLE 19:<br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE-ANODE | STYLE 20:<br>PIN 1. CATHODE<br>2. ANODE<br>3. GATE          |
| STYLE 21:<br>PIN 1. GATE<br>2. SOURCE<br>3. DRAIN       | STYLE 22:<br>PIN 1. RETURN<br>2. OUTPUT<br>3. INPUT   | STYLE 23:<br>PIN 1. ANODE<br>2. ANODE<br>3. CATHODE         | STYLE 24:<br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE           | STYLE 25:<br>PIN 1. ANODE<br>2. CATHODE<br>3. GATE          | STYLE 26:<br>PIN 1. CATHODE<br>2. ANODE<br>3. NO CONNECTION |
| STYLE 27:<br>PIN 1. CATHODE<br>2. CATHODE<br>3. CATHODE | STYLE 28:<br>PIN 1. ANODE<br>2. ANODE<br>3. ANODE     |   |   |   |   |

|                  |                                      |   |
|------------------|--------------------------------------|---|
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