

# PNP Silicon Epitaxial Transistor

## BCP69T1G, NSVBCP69T1G

This PNP Silicon Epitaxial Transistor is designed for use in low voltage, high current applications. The device is housed in the SOT-223 package, which is designed for medium power surface mount applications.

### Features

- High Current:  $I_C = -1.0$  A
- The SOT-223 Package Can Be Soldered Using Wave or Reflow.
- SOT-223 package ensures level mounting, resulting in improved thermal conduction, and allows visual inspection of soldered joints. The formed leads absorb thermal stress during soldering, eliminating the possibility of damage to the die.
- NPN Complement is BCP68
- AEC-Q101 Qualified and PPAP Capable
- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

| Rating                                                                                         | Symbol         | Value      | Unit                      |
|------------------------------------------------------------------------------------------------|----------------|------------|---------------------------|
| Collector-Emitter Voltage                                                                      | $V_{CEO}$      | -20        | Vdc                       |
| Collector-Base Voltage                                                                         | $V_{CBO}$      | -25        | Vdc                       |
| Emitter-Base Voltage                                                                           | $V_{EBO}$      | -5.0       | Vdc                       |
| Collector Current                                                                              | $I_C$          | -1.0       | Adc                       |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 1)<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.5<br>12  | W<br>mW/ $^\circ\text{C}$ |
| Operating and Storage Temperature Range                                                        | $T_J, T_{stg}$ | -65 to 150 | $^\circ\text{C}$          |

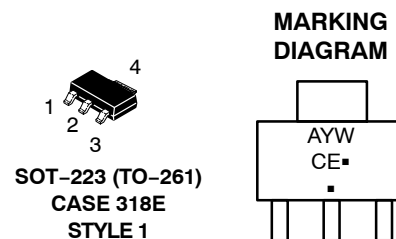
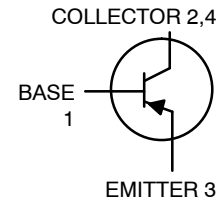
### THERMAL CHARACTERISTICS

| Characteristic                                                                | Symbol          | Max       | Unit                      |
|-------------------------------------------------------------------------------|-----------------|-----------|---------------------------|
| Thermal Resistance – Junction-to-Ambient<br>(Surface Mounted)                 | $R_{\theta JA}$ | 83.3      | $^\circ\text{C}/\text{W}$ |
| Lead Temperature for Soldering,<br>0.0625 in from case<br>Time in Solder Bath | $T_L$           | 260<br>10 | $^\circ\text{C}$<br>s     |

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. Device mounted on a glass epoxy printed circuit board 1.575 in. x 1.575 in. x 0.059 in.; mounting pad for the collector lead min. 0.93 sq. in.

## MEDIUM POWER PNP SILICON HIGH CURRENT TRANSISTOR SURFACE MOUNT



CE = Specific Device Code  
A = Assembly Location  
Y = Year  
W = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device      | Package              | Shipping <sup>†</sup> |
|-------------|----------------------|-----------------------|
| BCP69T1G    | SOT-223<br>(Pb-Free) | 1000 / Tape & Reel    |
| NSVBCP69T1G | SOT-223<br>(Pb-Free) | 1000 / 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 Specification Brochure, [BRD8011/D](http://www.onsemi.com/BRD8011/D).

# BCP69T1G, NSVBCP69T1G

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

| Characteristics                                                                                                                                                                                   | Symbol               | Min            | Typ         | Max           | Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------|-------------|---------------|------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                                                                        |                      |                |             |               |      |
| Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -100 µAdc, I <sub>E</sub> = 0)                                                                                                              | V <sub>(BR)CES</sub> | -25            | -           | -             | Vdc  |
| Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -1.0 mAdc, I <sub>B</sub> = 0)                                                                                                              | V <sub>(BR)CEO</sub> | -20            | -           | -             | Vdc  |
| Emitter-Base Breakdown Voltage (I <sub>E</sub> = -10 µAdc, I <sub>C</sub> = 0)                                                                                                                    | V <sub>(BR)EBO</sub> | -5.0           | -           | -             | Vdc  |
| Collector-Base Cutoff Current (V <sub>CB</sub> = -25 Vdc, I <sub>E</sub> = 0)                                                                                                                     | I <sub>CBO</sub>     | -              | -           | -10           | µAdc |
| Emitter-Base Cutoff Current (V <sub>EB</sub> = -5.0 Vdc, I <sub>C</sub> = 0)                                                                                                                      | I <sub>EBO</sub>     | -              | -           | -10           | µAdc |
| <b>ON CHARACTERISTICS</b>                                                                                                                                                                         |                      |                |             |               |      |
| DC Current Gain<br>(I <sub>C</sub> = -5.0 mAdc, V <sub>CE</sub> = -10 Vdc)<br>(I <sub>C</sub> = -500 mAdc, V <sub>CE</sub> = -1.0 Vdc)<br>(I <sub>C</sub> = -1.0 Adc, V <sub>CE</sub> = -1.0 Vdc) | h <sub>FE</sub>      | 50<br>85<br>60 | -<br>-<br>- | -<br>375<br>- | -    |
| Collector-Emitter Saturation Voltage (I <sub>C</sub> = -1.0 Adc, I <sub>B</sub> = -100 mAdc)                                                                                                      | V <sub>CE(sat)</sub> | -              | -           | -0.5          | Vdc  |
| Base-Emitter On Voltage (I <sub>C</sub> = -1.0 Adc, V <sub>CE</sub> = -1.0 Vdc)                                                                                                                   | V <sub>BE(on)</sub>  | -              | -           | -1.0          | Vdc  |
| <b>DYNAMIC CHARACTERISTICS</b>                                                                                                                                                                    |                      |                |             |               |      |
| Current-Gain – Bandwidth Product<br>(I <sub>C</sub> = -10 mAdc, V <sub>CE</sub> = -5.0 Vdc)                                                                                                       | f <sub>T</sub>       | -              | 60          | -             | MHz  |

## TYPICAL ELECTRICAL CHARACTERISTICS

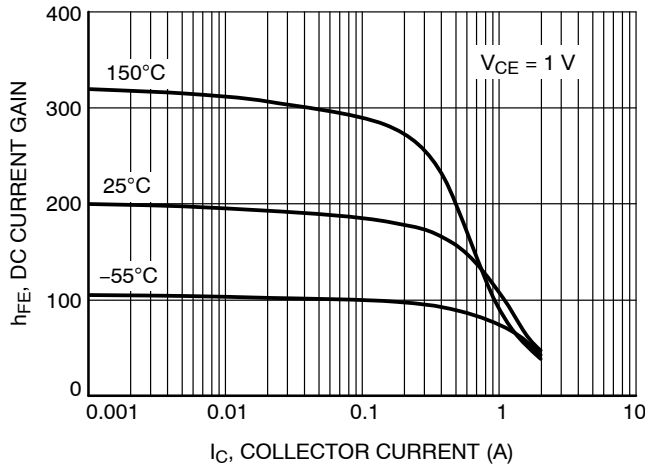


Figure 1. DC Current Gain

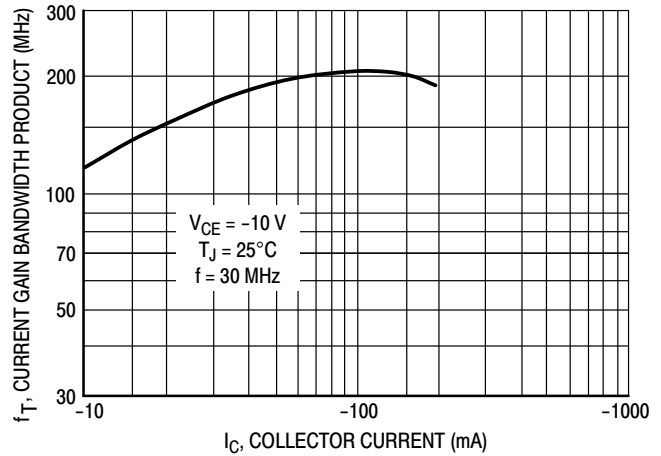
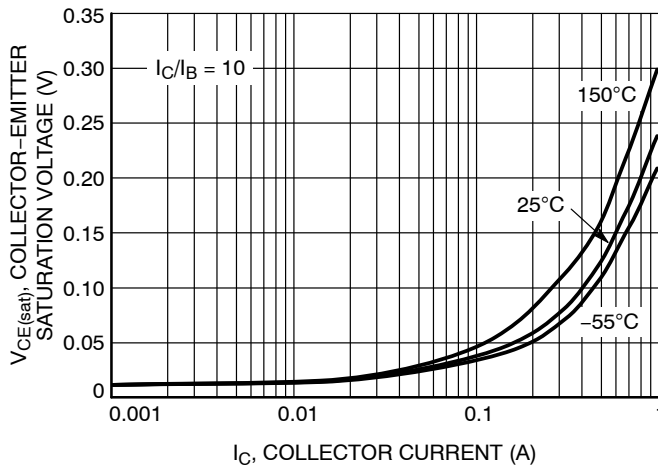


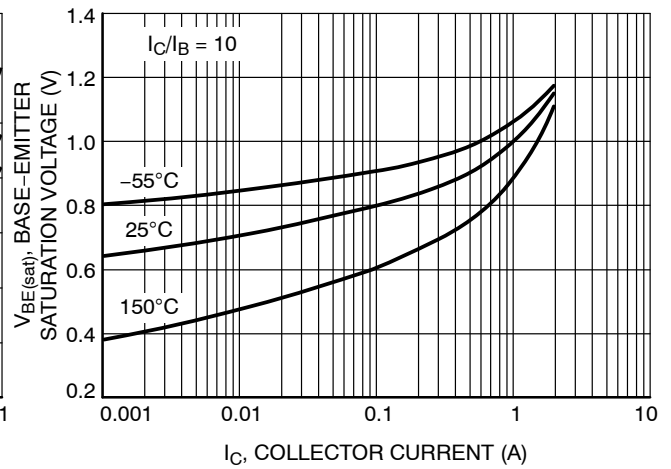
Figure 2. Current Gain Bandwidth Product

# BCP69T1G, NSVBCP69T1G

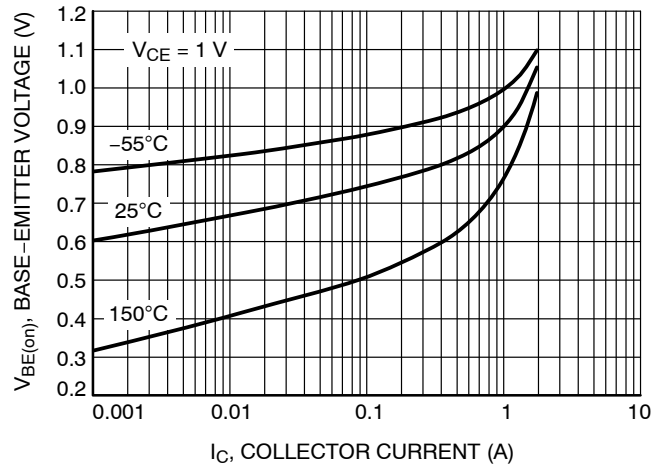
## TYPICAL ELECTRICAL CHARACTERISTICS



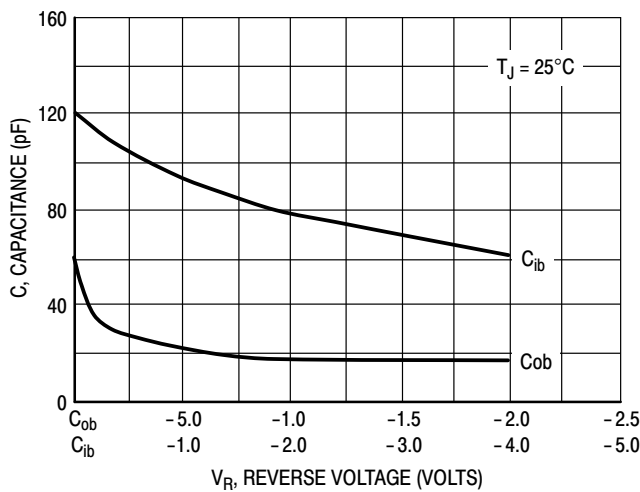
**Figure 3. Collector Emitter Saturation Voltage vs. Collector Current**



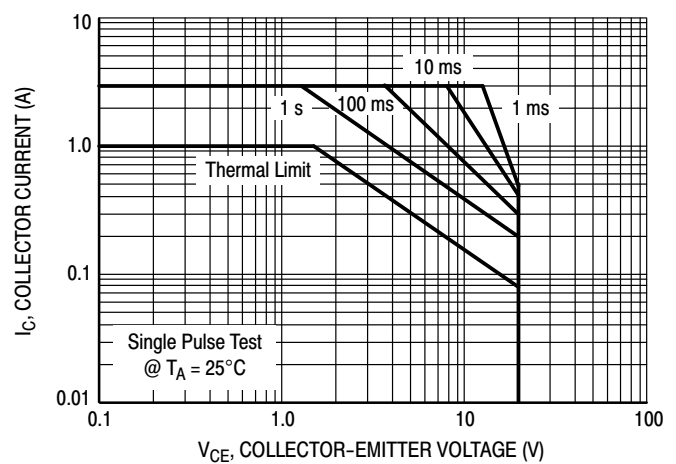
**Figure 4. Base Emitter Saturation Voltage vs. Collector Current**



**Figure 5. Base Emitter Voltage vs. Collector Current**



**Figure 6. Capacitances**



**Figure 7. Safe Operating Area**

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at  
[www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)