

NPN Silicon Epitaxial Transistor

BCP68T1G

This NPN 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
- 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
- The PNP Complement is BCP69T1
- S 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 (T_C = 25°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
Collector Current – Peak (Note 2)	I _{CM}	3.0	Adc
Base Current – Continuous	I _B	0.4	Adc
Base Current – Peak	I _{BM}	0.4	Adc
Total Power Dissipation @ T _A = 25°C (Note 1) Derate above 25°C	P _D	1.5 12	W mW/°C
Operating and Storage Temperature Range	T _J , T _{stg}	–65 to 150	°C

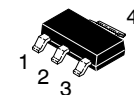
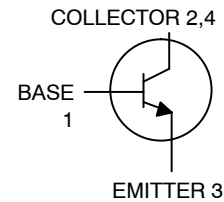
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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.
2. Reference SOA curve for I_C peak.

THERMAL CHARACTERISTICS

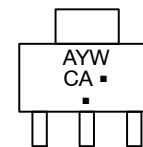
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient (Surface Mounted)	R _{θJA}	83.3	°C/W
Lead Temperature for Soldering, 0.0625 in from case Time in Solder Bath	T _L	260 10	°C Sec

MEDIUM POWER NPN SILICON HIGH CURRENT TRANSISTOR SURFACE MOUNT



SOT-223
CASE 318E
STYLE 1

MARKING DIAGRAM



CA = 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†
BCP68T1G	SOT-223 (Pb-Free)	1,000/Tape & Reel
SBCP68T1G*, NSVBCP68T1G*	SOT-223 (Pb-Free)	1,000/Tape & Reel
BCP68T3G	SOT-223 (Pb-Free)	4,000/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.

BCP68T1G

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
-----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (I _C = 100 µAdc, I _E = 0)	V _{(BR)CES}	25	–	–	Vdc
Collector-Emitter Breakdown Voltage (I _C = 1.0 mAdc, I _B = 0)	V _{(BR)CEO}	20	–	–	Vdc
Emitter-Base Breakdown Voltage (I _E = 10 µAdc, I _C = 0)	V _{(BR)EBO}	5.0	–	–	Vdc
Collector-Base Cutoff Current (V _{CB} = 25 Vdc, I _E = 0)	I _{CBO}	–	–	10	µAdc
Emitter-Base Cutoff Current (V _{EB} = 5.0 Vdc, I _C = 0)	I _{EBO}	–	–	10	µAdc

ON CHARACTERISTICS

DC Current Gain (I _C = 5.0 mAdc, V _{CE} = 10 Vdc) (I _C = 500 mAdc, V _{CE} = 1.0 Vdc) (I _C = 1.0 Adc, V _{CE} = 1.0 Vdc)	h _{FE}	50 85 60	– – –	– 375 –	–
Collector-Emitter Saturation Voltage (I _C = 1.0 Adc, I _B = 100 mAdc)	V _{CE(sat)}	–	–	0.5	Vdc
Base-Emitter On Voltage (I _C = 1.0 Adc, V _{CE} = 1.0 Vdc)	V _{BE(on)}	–	–	1.0	Vdc

DYNAMIC CHARACTERISTICS

Current-Gain – Bandwidth Product (I _C = 10 mAdc, V _{CE} = 5.0 Vdc)	f _T	–	60	–	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{obo}	–	15	–	pF
Output Capacitance (V _{EB} = 5 Vdc, I _E = 0, f = 1.0 MHz)	C _{ibo}	–	145	–	pF

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.

TYPICAL ELECTRICAL CHARACTERISTICS

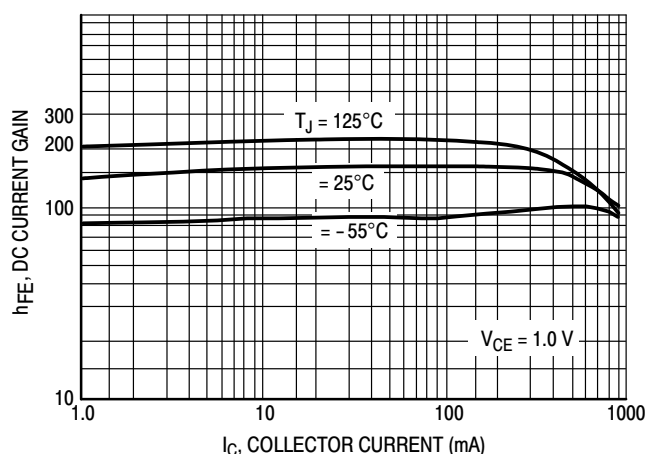


Figure 1. DC Current Gain

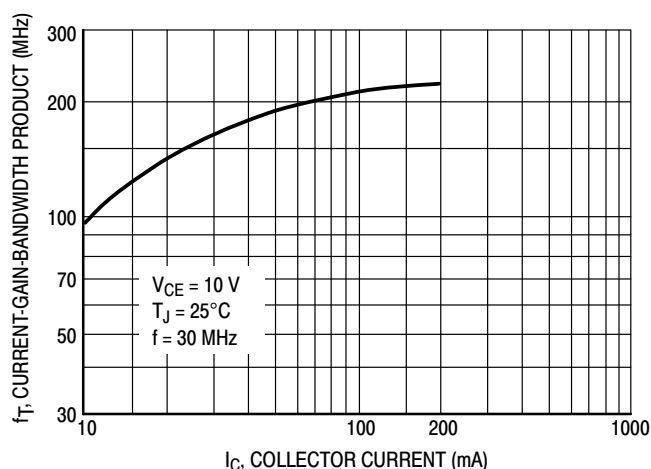


Figure 2. Current-Gain-Bandwidth Product

TYPICAL ELECTRICAL CHARACTERISTICS

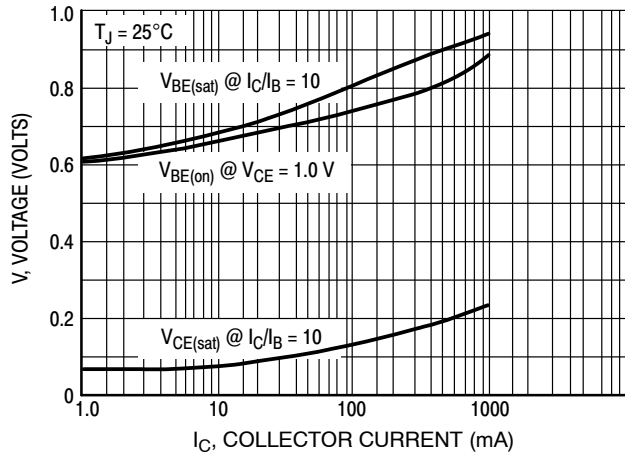


Figure 3. "On" Voltage

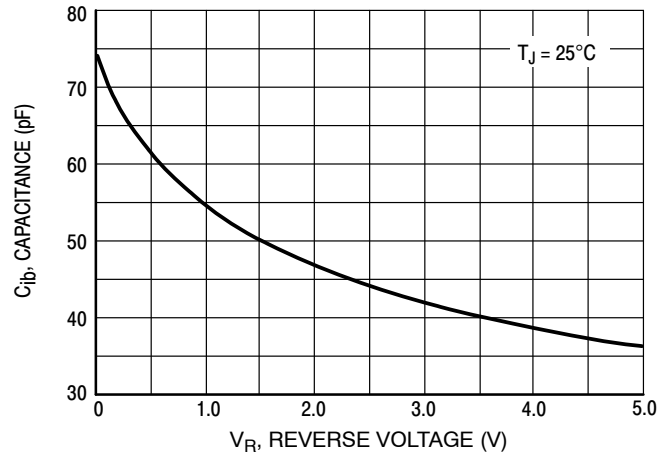


Figure 4. Capacitance

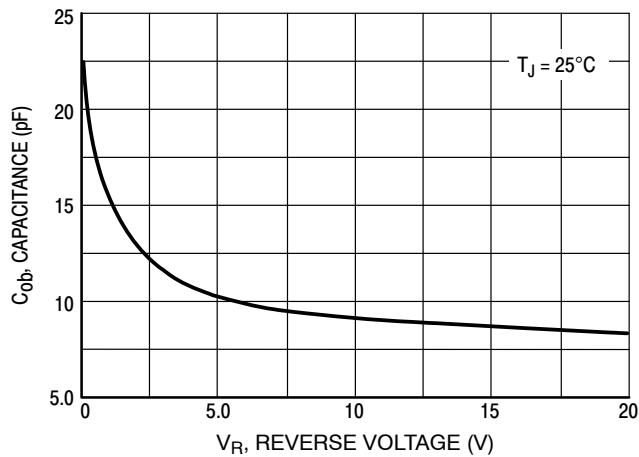


Figure 5. Capacitance

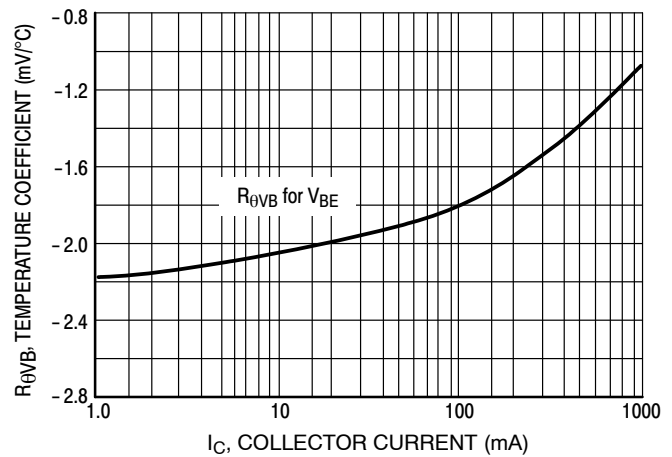


Figure 6. Base-Emitter Temperature Coefficient

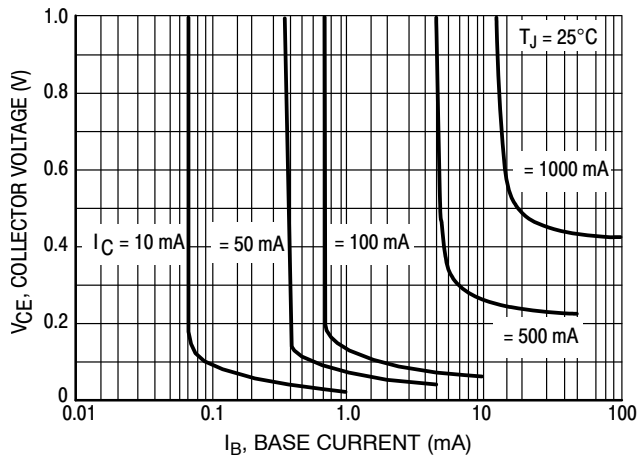


Figure 7. Saturation Region

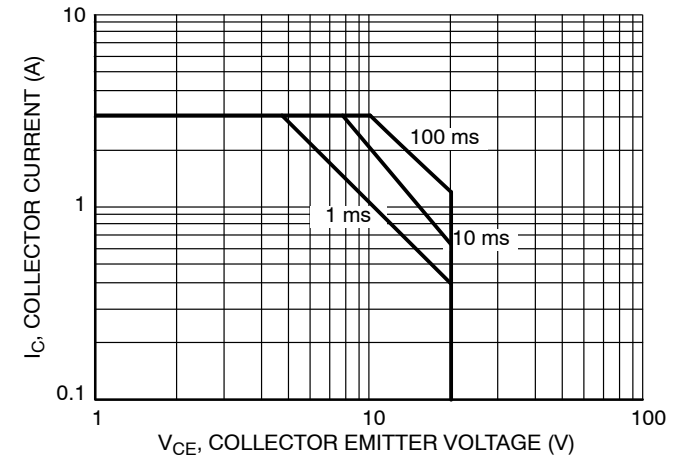


Figure 8. Safe Operating Area

TYPICAL ELECTRICAL CHARACTERISTICS

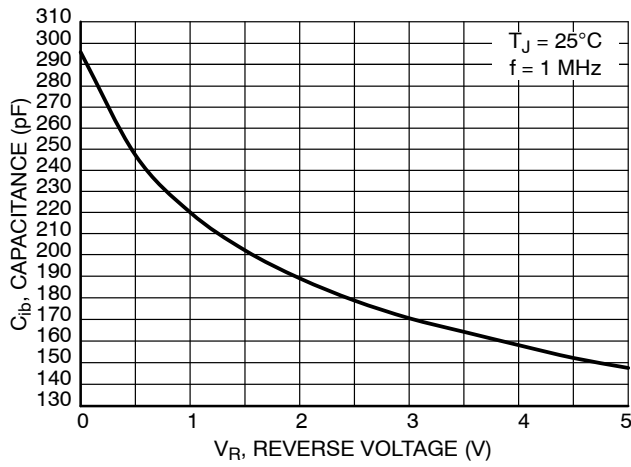


Figure 9. Input Capacitance

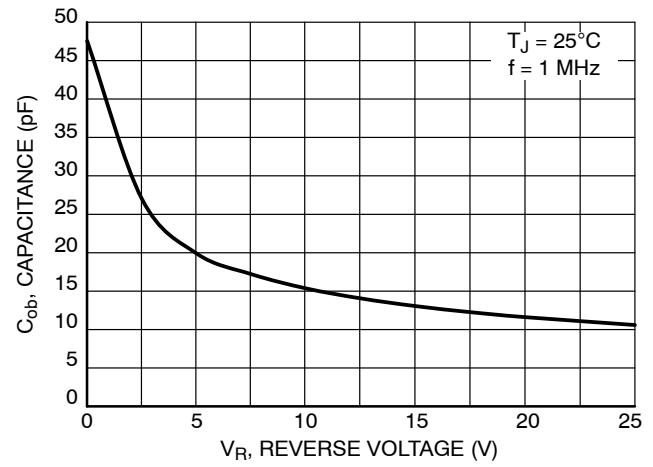


Figure 10. Output Capacitance

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. **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
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales