

# NPN Silicon Transistor

## BF720T1G, SBF720T1G, BF720T3G

### Features

- AEC-Q101 Qualified and PPAP Capable
- S 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

| Rating                                                 | Symbol    | Value       | Unit             |
|--------------------------------------------------------|-----------|-------------|------------------|
| Collector – Emitter Voltage                            | $V_{CEO}$ | 300         | Vdc              |
| Collector – Base Voltage                               | $V_{CBO}$ | 300         | Vdc              |
| Collector – Emitter Voltage                            | $V_{CER}$ | 300         | Vdc              |
| Emitter – Base Voltage                                 | $V_{EBO}$ | 5.0         | Vdc              |
| Collector Current                                      | $I_C$     | 100         | mAdc             |
| Total Power Dissipation up to $T_A = 25^\circ\text{C}$ | $P_D$     | 1.5         | W                |
| Storage Temperature Range                              | $T_{stg}$ | -65 to +150 | $^\circ\text{C}$ |
| Junction Temperature                                   | $T_J$     | 150         | $^\circ\text{C}$ |

### THERMAL CHARACTERISTICS

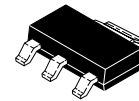
| Characteristic                                      | Symbol          | Max  | Unit               |
|-----------------------------------------------------|-----------------|------|--------------------|
| Thermal Resistance,<br>Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 83.3 | $^\circ\text{C/W}$ |

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.

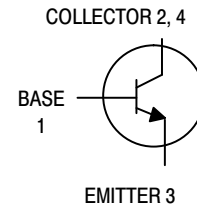
2. Device mounted on a glass epoxy printed circuit board 1.575 in. x 1.575 in. x 0.059 in.; mounting pad for the collector lead min. 0.93 in<sup>2</sup>.

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

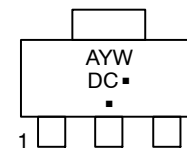
## NPN SILICON TRANSISTOR SURFACE MOUNT



SOT-223 (TO-261)  
CASE 318E  
STYLE 1



### MARKING DIAGRAM



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

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device    | Package           | Shipping <sup>†</sup> |
|-----------|-------------------|-----------------------|
| BF720T1G  | SOT-223 (Pb-Free) | 1,000 / Tape & Reel   |
| SBF720T1G | SOT-223 (Pb-Free) | 1,000 / Tape & Reel   |

### DISCONTINUED (Note 1)

|          |                   |                     |
|----------|-------------------|---------------------|
| BF720T3G | SOT-223 (Pb-Free) | 4,000 / 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 Specification Brochure, BRD8011/D.

1. **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).

# BF720T1G, SBF720T1G, BF720T3G

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristics                                                                                                                                                                                | Symbol        | Min    | Max      | Unit                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|----------|-------------------------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                                                                     |               |        |          |                         |
| Collector-Emitter Breakdown Voltage<br>( $I_C = 1.0\text{ mA}$ , $I_B = 0$ )                                                                                                                   | $V_{(BR)CEO}$ | 300    | –        | Vdc                     |
| Collector-Base Breakdown Voltage<br>( $I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ )                                                                                                             | $V_{(BR)CBO}$ | 300    | –        | Vdc                     |
| Collector-Emitter Breakdown Voltage<br>( $I_C = 100\text{ }\mu\text{A}$ , $R_{BE} = 2.7\text{ k}\Omega$ )                                                                                      | $V_{(BR)CER}$ | 300    | –        | Vdc                     |
| Emitter-Base Breakdown Voltage<br>( $I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$ )                                                                                                                | $V_{(BR)EBO}$ | 5.0    | –        | Vdc                     |
| Collector-Base Cutoff Current<br>( $V_{CB} = 200\text{ Vdc}$ , $I_E = 0$ )                                                                                                                     | $I_{CBO}$     | –      | 10       | nAdc                    |
| Collector-Emitter Cutoff Current<br>( $V_{CE} = 250\text{ Vdc}$ , $R_{BE} = 2.7\text{ k}\Omega$ )<br>( $V_{CE} = 200\text{ Vdc}$ , $R_{BE} = 2.7\text{ k}\Omega$ , $T_J = 150^\circ\text{C}$ ) | $I_{CER}$     | –<br>– | 50<br>10 | nAdc<br>$\mu\text{Adc}$ |
| <b>ON CHARACTERISTICS</b>                                                                                                                                                                      |               |        |          |                         |
| DC Current Gain<br>( $I_C = 25\text{ mA}$ , $V_{CE} = 20\text{ Vdc}$ )                                                                                                                         | $h_{FE}$      | 50     | –        | –                       |
| Collector-Emitter Saturation Voltage<br>( $I_C = 30\text{ mA}$ , $I_B = 5.0\text{ mA}$ )                                                                                                       | $V_{CE(sat)}$ | –      | 0.6      | Vdc                     |
| <b>DYNAMIC CHARACTERISTICS</b>                                                                                                                                                                 |               |        |          |                         |
| Current-Gain – Bandwidth Product<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 35\text{ MHz}$ )                                                                                  | $f_T$         | 60     | –        | MHz                     |
| Feedback Capacitance<br>( $V_{CE} = 30\text{ Vdc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )                                                                                                        | $C_{re}$      | –      | 1.6      | pF                      |



# BF720T1G, SBF720T1G, BF720T3G

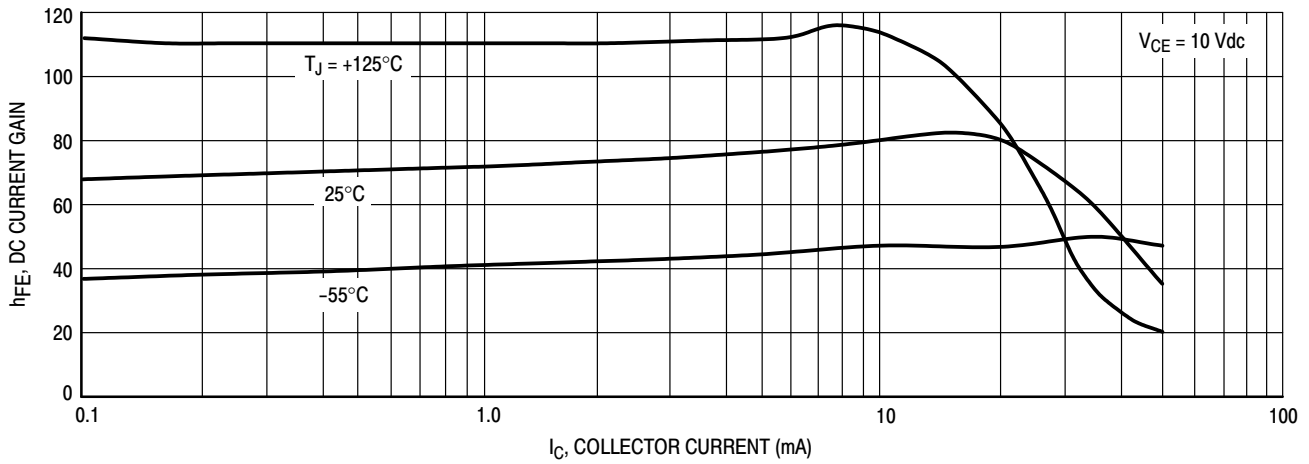


Figure 1. DC Current Gain

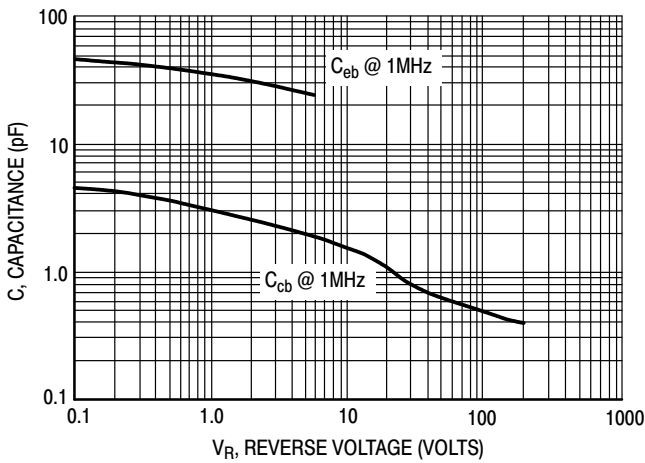


Figure 2. Capacitance

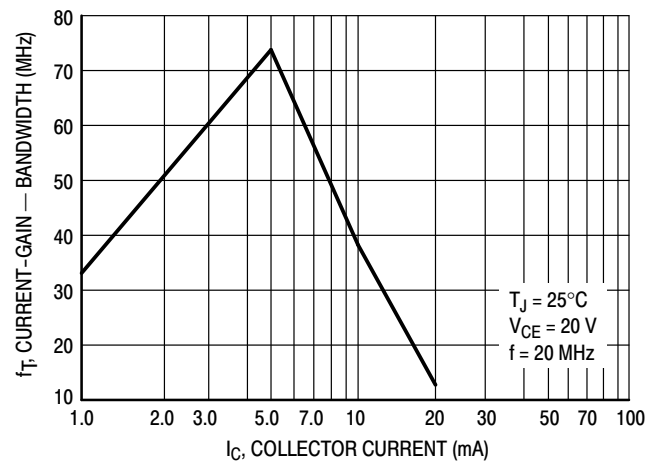


Figure 3. Current-Gain - Bandwidth

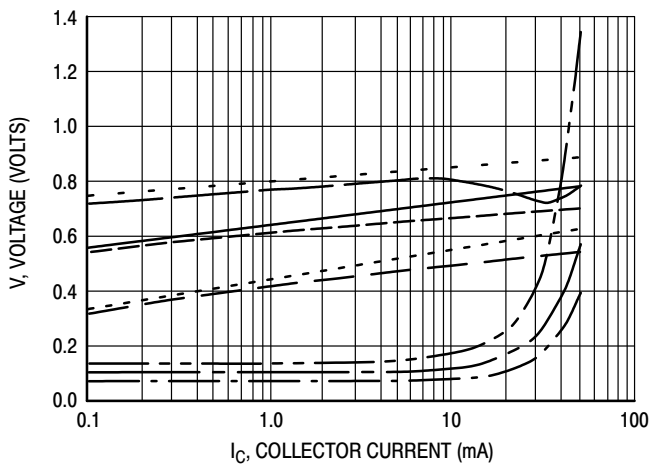


Figure 4. "ON" Voltages

- $V_{CE(sat)}$  @  $25^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @  $125^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @  $-55^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $25^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $125^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $-55^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(on)}$  @  $25^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$  @  $125^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$  @  $-55^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$

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