

# BF720T1G, SBF720T1G, BF720T3G

## NPN Silicon Transistor

### 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, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	83.3	$^\circ\text{C/W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

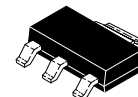
1. Device mounted on a glass epoxy printed circuit board 1.575 in. x 1.575 in. x 0.059 in.; mounting pad for the collector lead min. 0.93 in<sup>2</sup>.



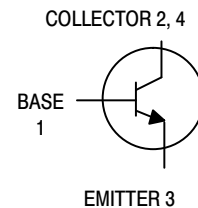
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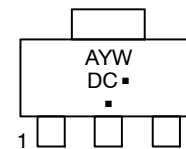
## NPN SILICON TRANSISTOR SURFACE MOUNT



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†
BF720T1G	SOT-223 (Pb-Free)	1,000 / Tape & Reel
SBF720T1G	SOT-223 (Pb-Free)	1,000 / Tape & Reel
BF720T3G	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.

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

Characteristics	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	300	–	Vdc
Collector-Base Breakdown Voltage (I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	300	–	Vdc
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 100 μA, R <sub>BE</sub> = 2.7 kΩ)	V <sub>(BR)CER</sub>	300	–	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	5.0	–	Vdc
Collector-Base Cutoff Current (V <sub>CB</sub> = 200 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	–	10	nAdc
Collector-Emitter Cutoff Current (V <sub>CE</sub> = 250 Vdc, R <sub>BE</sub> = 2.7 kΩ) (V <sub>CE</sub> = 200 Vdc, R <sub>BE</sub> = 2.7 kΩ, T <sub>J</sub> = 150°C)	I <sub>CER</sub>	–	50 10	nAdc μAdc
<b>ON CHARACTERISTICS</b>				
DC Current Gain (I <sub>C</sub> = 25 mA, V <sub>CE</sub> = 20 Vdc)	h <sub>FE</sub>	50	–	–
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 30 mA, I <sub>B</sub> = 5.0 mA)	V <sub>CE(sat)</sub>	–	0.6	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current-Gain – Bandwidth Product (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 10 Vdc, f = 35 MHz)	f <sub>T</sub>	60	–	MHz
Feedback Capacitance (V <sub>CE</sub> = 30 Vdc, I <sub>C</sub> = 0, f = 1.0 MHz)	C <sub>re</sub>	–	1.6	pF

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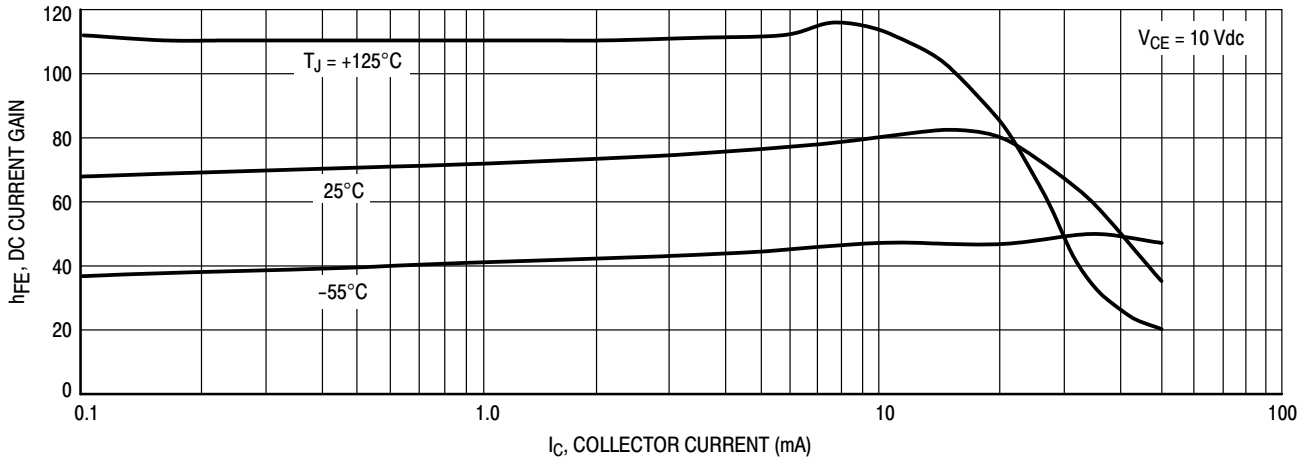


Figure 1. DC Current Gain

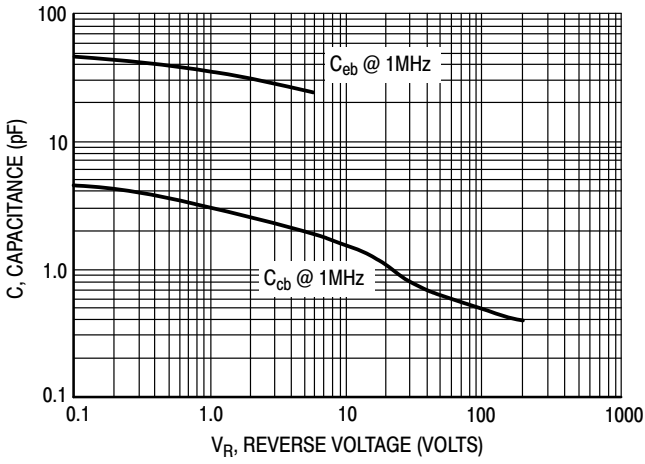


Figure 2. Capacitance

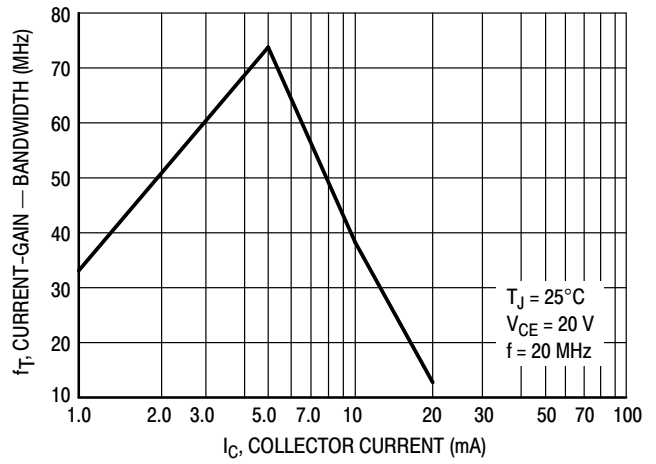


Figure 3. Current-Gain - Bandwidth

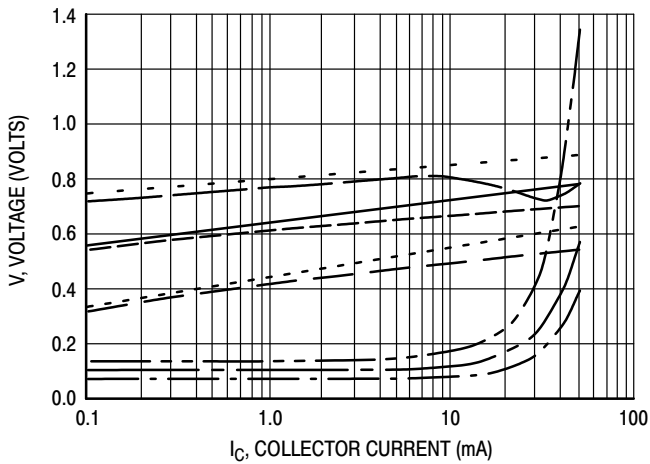


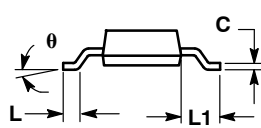
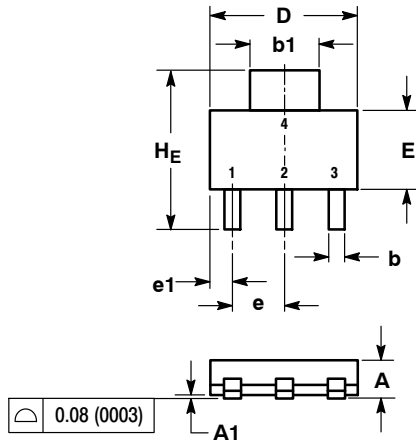
Figure 4. "ON" Voltages

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

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## PACKAGE DIMENSIONS

SOT-223 (TO-261)  
CASE 318E-04  
ISSUE N

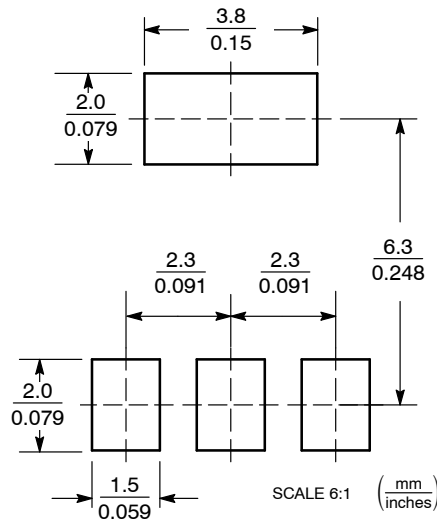


- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.  
2. CONTROLLING DIMENSION: INCH.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.50	1.63	1.75	0.060	0.064	0.068
A1	0.02	0.06	0.10	0.001	0.002	0.004
b	0.60	0.75	0.89	0.024	0.030	0.035
b1	2.90	3.06	3.20	0.115	0.121	0.126
c	0.24	0.29	0.35	0.009	0.012	0.014
D	6.30	6.50	6.70	0.249	0.256	0.263
E	3.30	3.50	3.70	0.130	0.138	0.145
e	2.20	2.30	2.40	0.087	0.091	0.094
e1	0.85	0.94	1.05	0.033	0.037	0.041
L	0.20	---	---	0.008	---	---
L1	1.50	1.75	2.00	0.060	0.069	0.078
HE	6.70	7.00	7.30	0.264	0.276	0.287
θ	0°	-	10°	0°	-	10°

- STYLE 1:  
PIN 1: BASE  
2: COLLECTOR  
3: EMITTER  
4: 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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