BCP56 Series

NPN Silicon
Epitaxial Transistor

These NPN Silicon Epitaxial transistors are designed for use in audio amplifier applications. The device is housed in the SOT−223 package, which is designed for medium power surface mount applications.

Features

- High Current: 1.0 A
- The SOT−223 package can be soldered using wave or reflow. The formed leads absorb thermal stress during soldering, eliminating the possibility of damage to the die
- Available in 12 mm Tape and Reel
    Use BCP56T1G to Order the 7 inch/1000 Unit Reel
    Use BCP56T3G to Order the 13 inch/4000 Unit Reel
- PNP Complement is BCP53T1G
- 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 (T_C = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector−Emitter Voltage	V_{CEO}	80	Vdc
Collector−Base Voltage	V_{CBO}	100	Vdc
Emitter−Base Voltage	V_{EBO}	5	Vdc
Collector Current	I_C	1	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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient (surface mounted)	$R_{\theta JA}$	83.3	°C/W
Maximum Temperature for Soldering Purposes Time in Solder Bath	T_L	260 10	°C Sec

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.
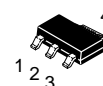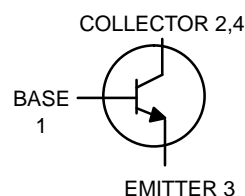
1. Device mounted on a FR−4 glass epoxy printed circuit board 1.575 in x 1.575 in x 0.0625 in; mounting pad for the collector lead = 0.93 sq in.
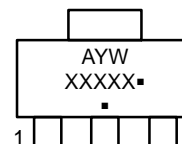
MEDIUM POWER NPN SILICON HIGH CURRENT TRANSISTOR SURFACE MOUNT

COLLECTOR 2,4

BASE 1

EMITTER 3

SOT−223
CASE 318E
STYLE 1

MARKING DIAGRAM

AYW
XXXXX•

1

XXXXX = Specific Device Code
A   = Assembly Location
Y   = Year
W   = Work Week
•   = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 2 of this data sheet.

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

Characteristics		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)		$V_{(BR)CBO}$	100	–	–	Vdc
Collector–Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)		$V_{(BR)CEO}$	80	–	–	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	–	–	Vdc
Collector–Base Cutoff Current (V_{CB} = 30 Vdc, I_E = 0)		I_{CBO}	–	–	100	nAdc
Emitter–Base Cutoff Current (V_{EB} = 5.0 Vdc, I_C = 0)		I_{EBO}	–	–	10	μAdc
ON CHARACTERISTICS (Note 2)						
DC Current Gain (I_C = 5.0 mA, V_{CE} = 2.0 V) (I_C = 150 mA, V_{CE} = 2.0 V)	All Part Types BCP56 BCP56–10 BCP56–16	h_{FE}	25 40 63 100	– – – –	– 250 160 250	–
(I_C = 500 mA, V_{CE} = 2.0 V)	All Types		25	–	–	
Collector–Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 50 mAdc)		$V_{CE(sat)}$	–	–	0.5	Vdc
Base–Emitter On Voltage (I_C = 500 mAdc, V_{CE} = 2.0 Vdc)		$V_{BE(on)}$	–	–	1.0	Vdc
DYNAMIC CHARACTERISTICS						
Current–Gain – Bandwidth Product (I_C = 10 mAdc, V_{CE} = 5.0 Vdc, f = 35 MHz)		f_T	–	130	–	MHz

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.
2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

ORDERING INFORMATION

Device	Marking	Package	Shipping†
BCP56T1G	BH	SOT–223 (Pb–Free)	1000 / Tape & Reel
SBCP56T1G*			
BCP56T3G	BH	SOT–223 (Pb–Free)	4000 / Tape & Reel
SBCP56T3G*			
BCP56–10T1G	BH–10	SOT–223 (Pb–Free)	1000 / Tape & Reel
SBCP56–10T1G*			
BCP56–10T3G	BH–10	SOT–223 (Pb–Free)	4000 / Tape & Reel
NSVBCP56–10T3G*			
BCP56–16T1G	BH–16	SOT–223 (Pb–Free)	1000 / Tape & Reel
SBCP56–16T1G*			
BCP56–16T3G	BH–16	SOT–223 (Pb–Free)	4000 / Tape & Reel
SBCP56–16T3G*			

†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.

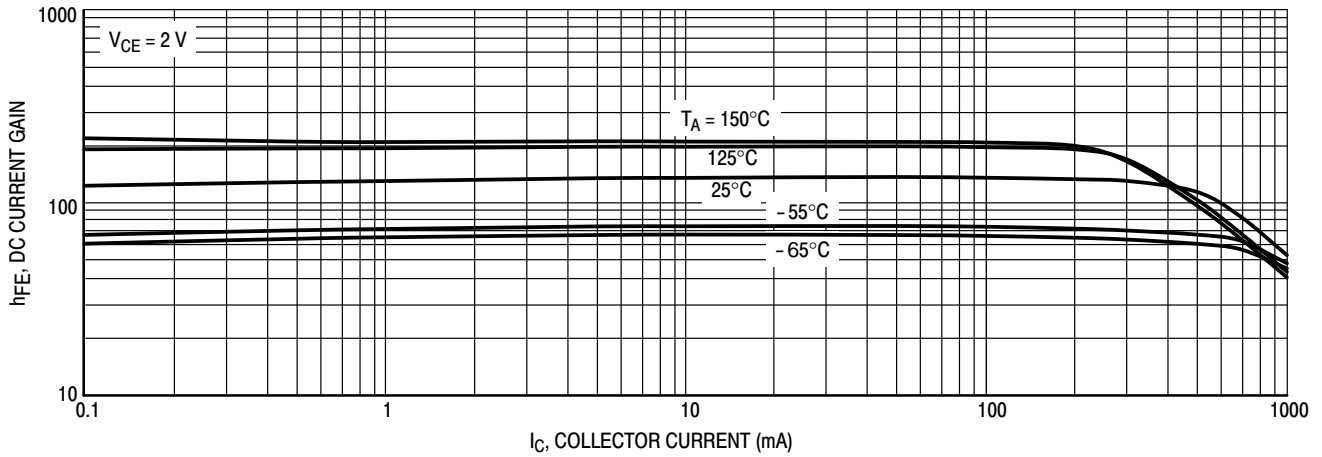# BCP56 Series

TYPICAL ELECTRICAL CHARACTERISTICS
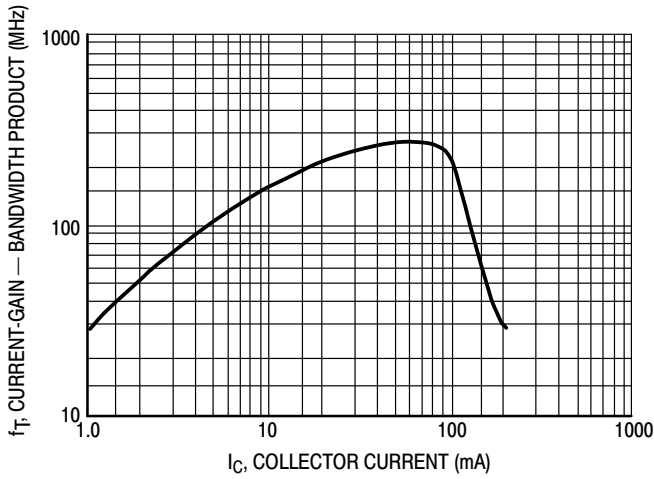

Figure 1. DC Current Gain

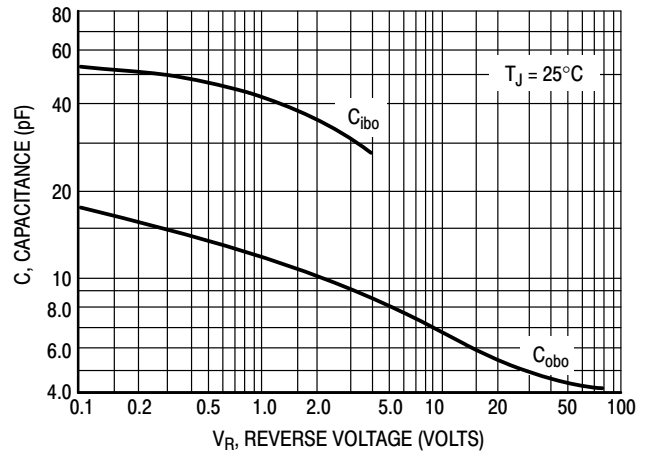**Figure 2. Current–Gain – Bandwidth Product**
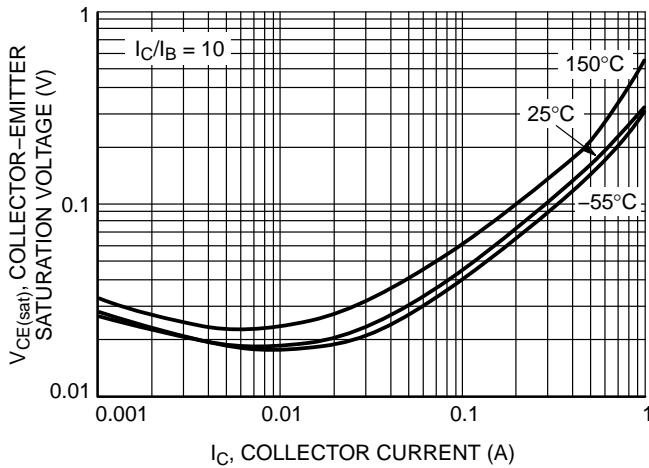

Figure 3. Capacitance

Figure 4. Collector Emitter Saturation Voltage vs. Collector Current
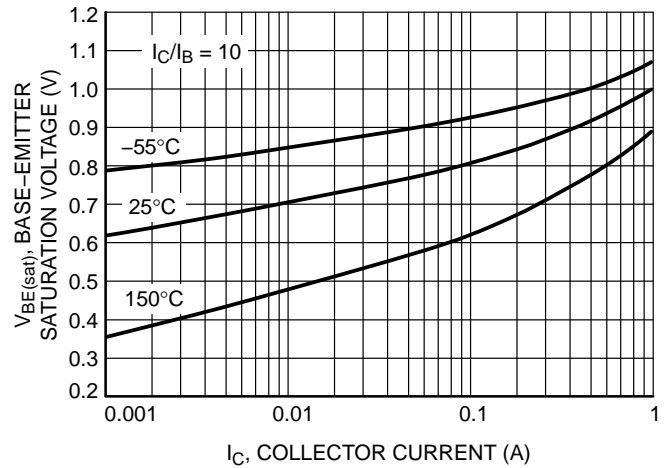

Figure 5. Base Emitter Saturation Voltage vs. Collector Current
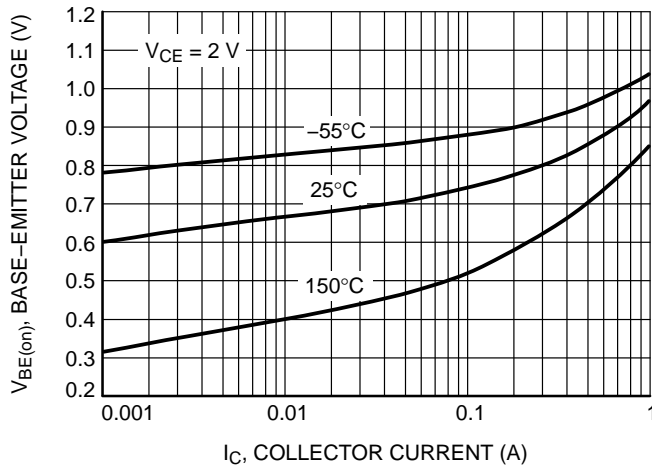
TYPICAL ELECTRICAL CHARACTERISTICS

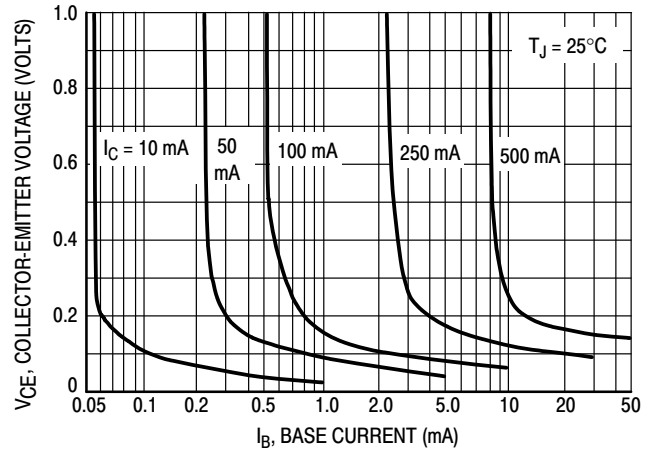**Figure 6. Base Emitter Voltage vs. Collector Current**
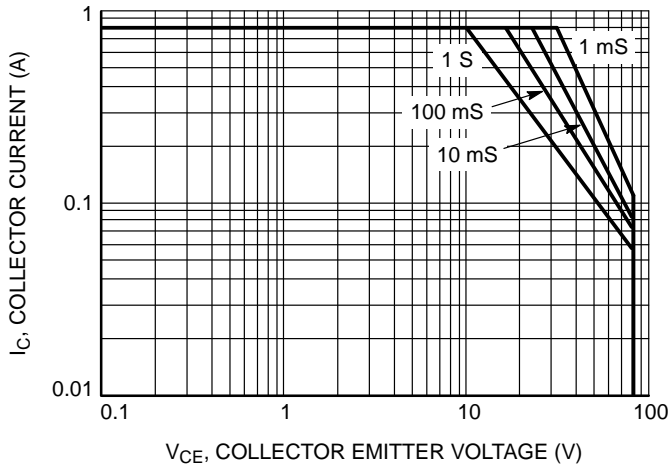
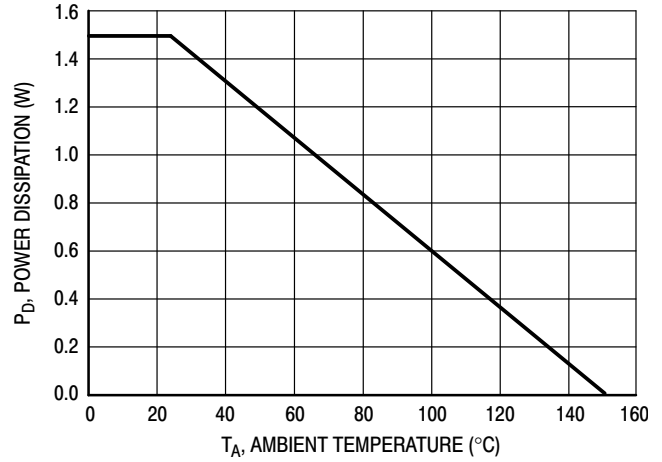**Figure 7. Collector Saturation Region**

Figure 8. Safe Operating Area

Figure 9. Power Derating Curve

BCP56 Series

PACKAGE DIMENSIONS

SOT–223 (TO–261)
CASE 318E–04
ISSUE N
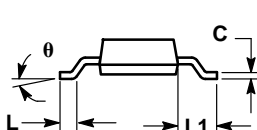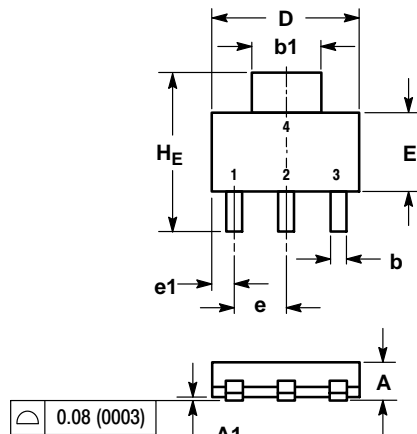
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCH.

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
H_E	6.70	7.00	7.30	0.264	0.276	0.287
θ	–			–		
	10°	0°	10°			

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

0.08 (0003)

SOLDERING FOOTPRINT*

$\frac{3.8}{0.15}$

$\frac{2.0}{0.079}$

$\frac{2.3}{0.091}$ $\frac{2.3}{0.091}$ $\frac{6.3}{0.248}$

$\frac{2.0}{0.079}$

$\frac{1.5}{0.059}$

SCALE 6:1 $\left(\frac{mm}{inches}\right)$
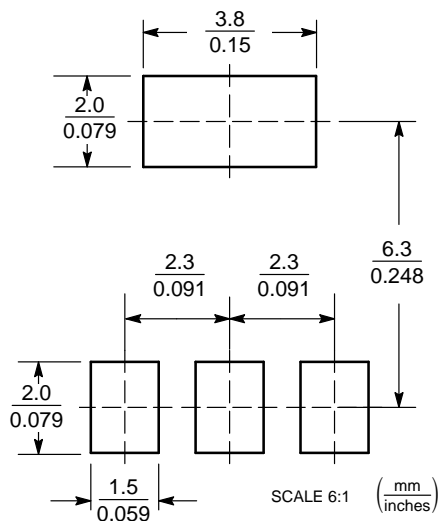
*For additional information on our Pb–Free strategy and soldering
details, please download the ON Semiconductor Soldering and
Mounting Techniques Reference Manual, SOLDERRM/D.

BCP56T1/D

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

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