BCP56T1 Series

Preferred Devices

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 Amp
- 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 BCP56T1 to order the 7 inch/1000 unit reel
  Use BCP56T3 to order the 13 inch/4000 unit reel
- PNP Complement is BCP53T1
- Pb−Free Packages are Available

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

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, 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.

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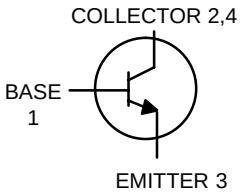
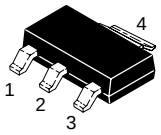
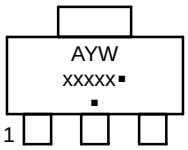
MEDIUM POWER NPN SILICON HIGH CURRENT TRANSISTOR SURFACE MOUNT





SOT−223
CASE 318E
STYLE 1

MARKING DIAGRAM



xx = 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 and shipping information in the package dimensions section on page 2 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

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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		h_{FE}				−
(I_C = 5.0 mA, V_{CE} = 2.0 V)	All Part Types		25	−	−	
(I_C = 150 mA, V_{CE} = 2.0 V)	BCP56T1		40	−	250	
	BCP56-10T1		63	−	160	
	BCP56-16T1		100	−	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

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

ORDERING INFORMATION

Device	Marking	Package	Shipping†
BCP56T1	BH	SOT−223	1000 / Tape & Reel
BCP56T1G	BH	SOT−223 (Pb−Free)	1000 / Tape & Reel
BCP56T3	BH	SOT−223	4000 / Tape & Reel
BCP56T3G	BH	SOT−223 (Pb−Free)	4000 / Tape & Reel
BCP56−10T1	BH−10	SOT−223	1000 / Tape & Reel
BCP56−10T1G	BH−10	SOT−223 (Pb−Free)	1000 / Tape & Reel
BCP56−16T1	BH−16	SOT−223	1000 / Tape & Reel
BCP56−16T1G	BH−16	SOT−223 (Pb−Free)	1000 / Tape & Reel
BCP56−16T3	BH−16	SOT−223	4000 / Tape & Reel
BCP56−16T3G	BH−16	SOT−223 (Pb−Free)	4000 / 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.

TYPICAL ELECTRICAL CHARACTERISTICS

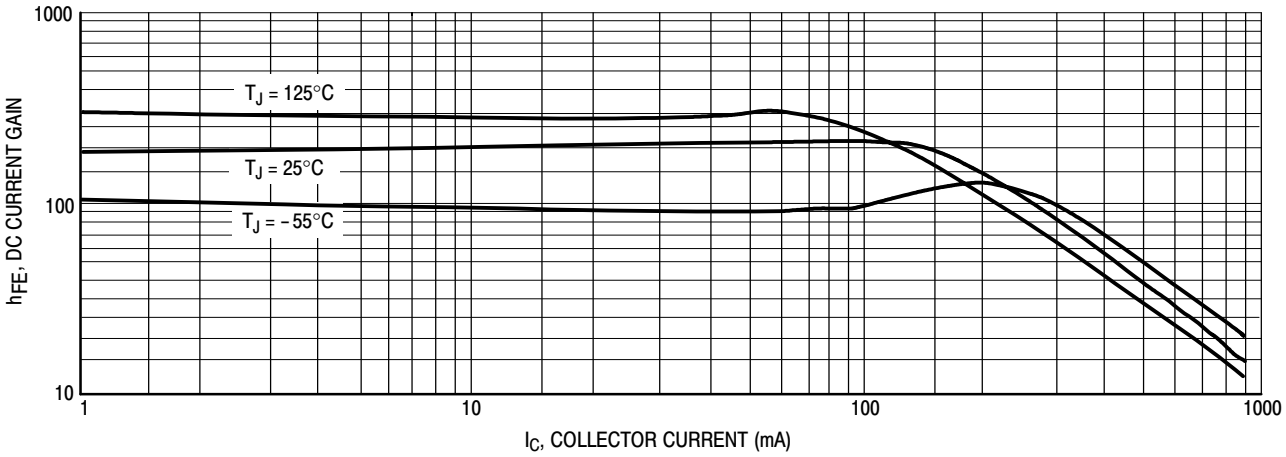


Figure 1. DC Current Gain

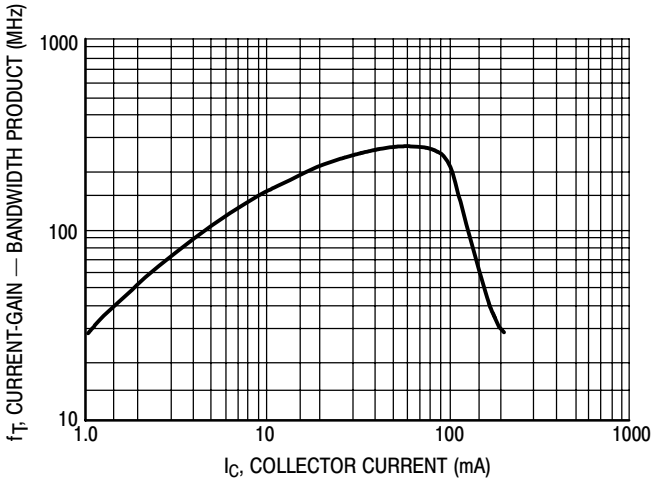


Figure 2. Current-Gain − Bandwidth Product

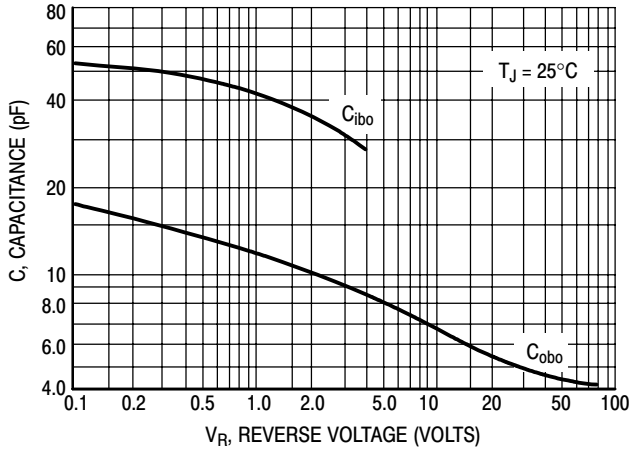


Figure 3. Capacitance

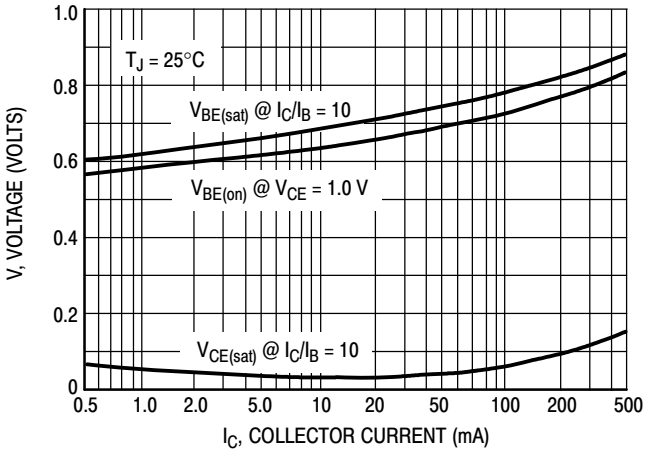


Figure 4. “On” Voltages

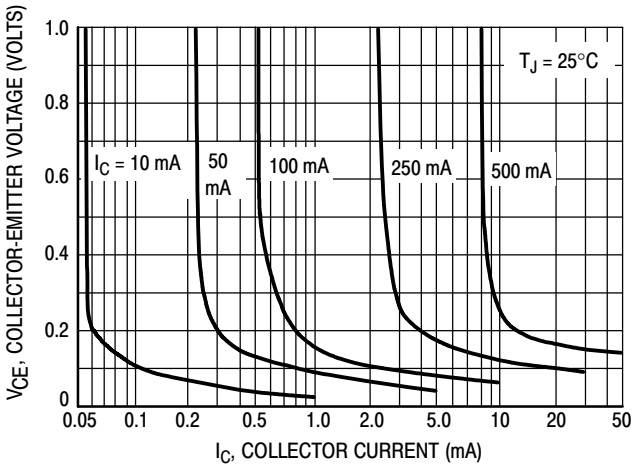
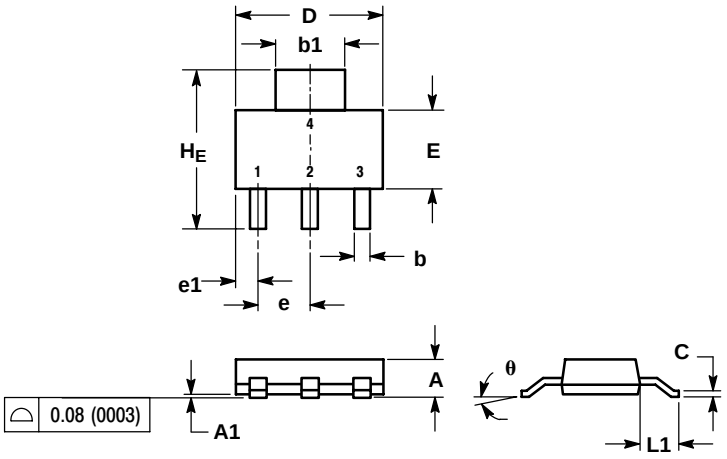


Figure 5. Collector Saturation Region

PACKAGE DIMENSIONS

SOT−223 (TO−261)
CASE 318E−04
ISSUE L

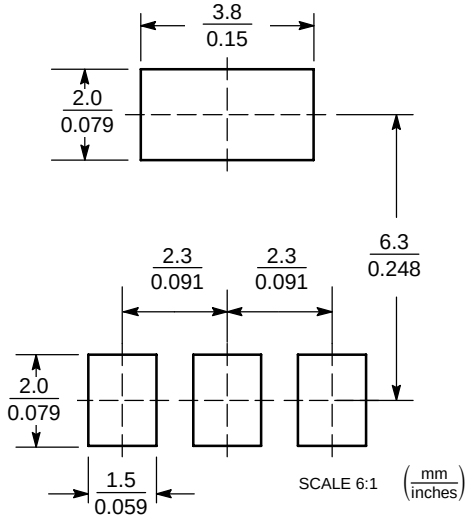


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	MILLIMETERS			INCHES		
DIM	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
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	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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