

# BCP53 Series, SBCP53 Series

## PNP Silicon Epitaxial Transistors

This PNP Silicon Epitaxial transistor is 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.

- High Current: 1.5 A
- NPN Complement is BCP56
- 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
- Device Marking:  
BCP53T1 = AH  
BCP53-10T1 = AH-10  
BCP53-16T1 = AH-16
- 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 ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	-80	Vdc
Collector-Base Voltage	$V_{CBO}$	-100	Vdc
Emitter-Base Voltage	$V_{EBO}$	-5.0	Vdc
Collector Current	$I_C$	1.5	Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 1.) Derate above $25^\circ\text{C}$	$P_D$	1.5 12	W mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient (surface mounted)	$R_{\theta JA}$	83.3	$^\circ\text{C}/\text{W}$
Lead Temperature for Soldering, 0.0625" from case Time in Solder Bath	$T_L$	260 10	$^\circ\text{C}$ s

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.

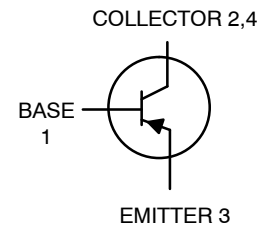
1. Device mounted on a glass epoxy printed circuit board 1.575 in. x 1.575 in. x 0.059 in.; mounting pad for the collector lead min. 0.93 sq. in.



**ON Semiconductor**<sup>®</sup>

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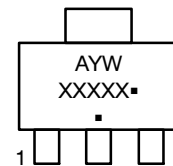
## MEDIUM POWER HIGH CURRENT SURFACE MOUNT PNP TRANSISTORS



### MARKING DIAGRAM



SOT-223  
CASE 318E  
STYLE 1



- A = Assembly Location
- Y = Year
- W = Work Week
- XXXXX = Specific Device Code
- = Pb-Free Package

(\*Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
BCP53T1G	SOT-223 (Pb-Free)	1000 / Tape & Reel
SBCP53-10T1G	SOT-223 (Pb-Free)	1000 / Tape & Reel
BCP53-10T1G	SOT-223 (Pb-Free)	1000 / Tape & Reel
SBCP53-10T1G	SOT-223 (Pb-Free)	1000 / Tape & Reel
BCP53-16T1G	SOT-223 (Pb-Free)	1000 / Tape & Reel
SBCP53-16T1G	SOT-223 (Pb-Free)	1000 / Tape & Reel
BCP53-16T3G	SOT-223 (Pb-Free)	4000 / 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 Specifications Brochure, BRD8011/D.

## BCP53 Series, SBCP53 Series

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

Characteristics	Symbol	Min	Typ	Max	Unit
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#### OFF CHARACTERISTICS

Collector-Base Breakdown Voltage ( $I_C = -100 \mu\text{A}$ , $I_E = 0$ )	$V_{(BR)CBO}$	-100	-	-	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = -1.0 \text{mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	-80	-	-	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = -100 \mu\text{A}$ , $R_{BE} = 1.0 \text{k}\Omega$ )	$V_{(BR)CER}$	-100	-	-	Vdc
Emitter-Base Breakdown Voltage ( $I_E = -10 \mu\text{A}$ , $I_C = 0$ )	$V_{(BR)EBO}$	-5.0	-	-	Vdc
Collector-Base Cutoff Current ( $V_{CB} = -30 \text{Vdc}$ , $I_E = 0$ )	$I_{CBO}$	-	-	-100	nA
Emitter-Base Cutoff Current ( $V_{EB} = -5.0 \text{Vdc}$ , $I_C = 0$ )	$I_{EBO}$	-	-	-10	$\mu\text{A}$

#### ON CHARACTERISTICS

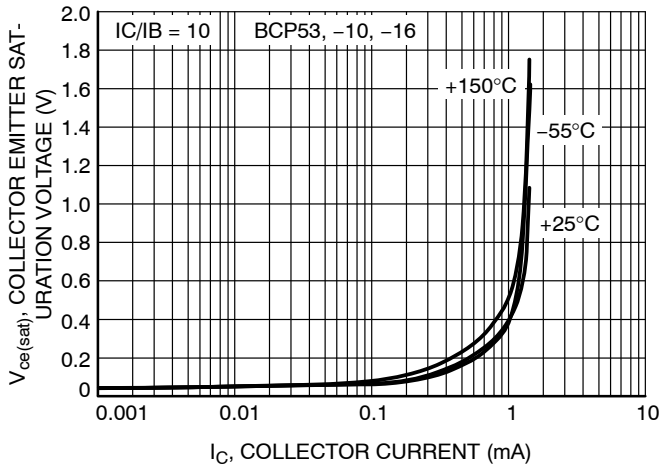
DC Current Gain ( $I_C = -5.0 \text{mA}$ , $V_{CE} = -2.0 \text{Vdc}$ ) All Part Types ( $I_C = -150 \text{mA}$ , $V_{CE} = -2.0 \text{Vdc}$ ) BCP53, SBCP53 BCP53-10, SBCP53-10 BCP53-16, SBCP53-16 ( $I_C = -500 \text{mA}$ , $V_{CE} = -2.0 \text{Vdc}$ ) All Part Types	$h_{FE}$	25	-	-	-
		40	-	250	
		63	-	160	
		100	-	250	
		25	-	-	
Collector-Emitter Saturation Voltage ( $I_C = -500 \text{mA}$ , $I_B = -50 \text{mA}$ )	$V_{CE(sat)}$	-	-	-0.5	Vdc
Base-Emitter On Voltage ( $I_C = -500 \text{mA}$ , $V_{CE} = -2.0 \text{Vdc}$ )	$V_{BE(on)}$	-	-	-1.0	Vdc

#### DYNAMIC CHARACTERISTICS

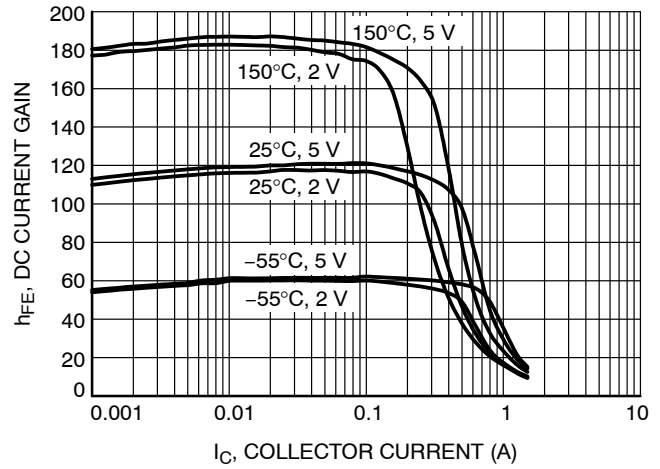
Current-Gain - Bandwidth Product ( $I_C = -10 \text{mA}$ , $V_{CE} = -5.0 \text{Vdc}$ , $f = 35 \text{MHz}$ )	$f_T$	-	50	-	MHz
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# BCP53 Series, SBCP53 Series

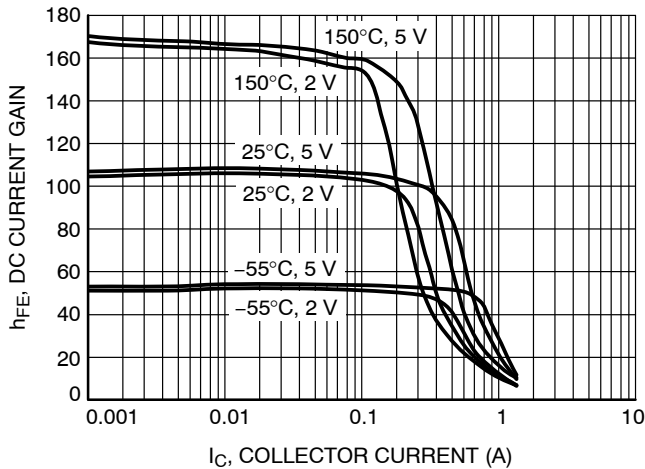
## TYPICAL CHARACTERISTICS



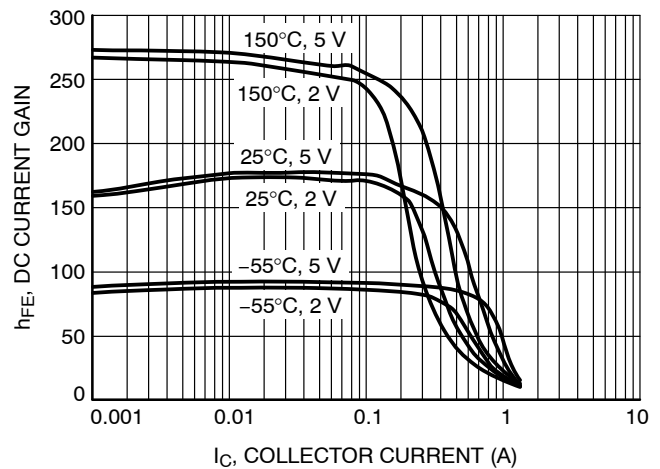
**Figure 1. Collector Emitter Saturation Voltage vs. Collector Current**



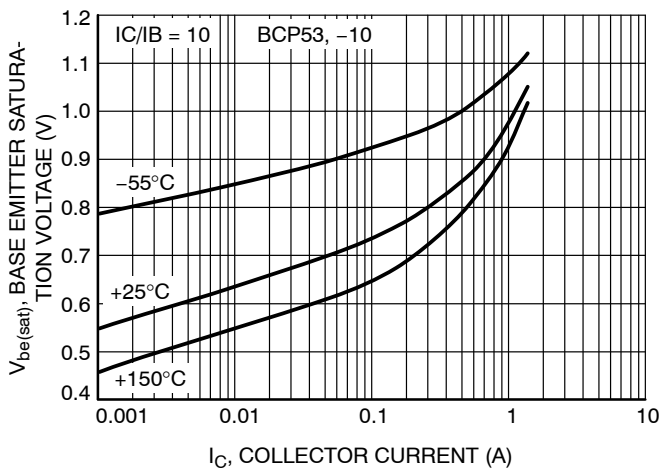
**Figure 2. DC Current Gain vs. Collector Current (BCP53)**



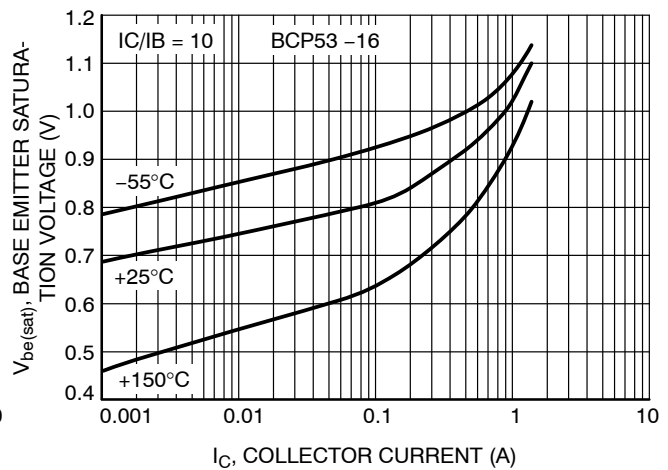
**Figure 3. DC Current Gain vs. Collector Current (BCP53-10)**



**Figure 4. DC Current Gain vs. Collector Current (BCP53-16)**



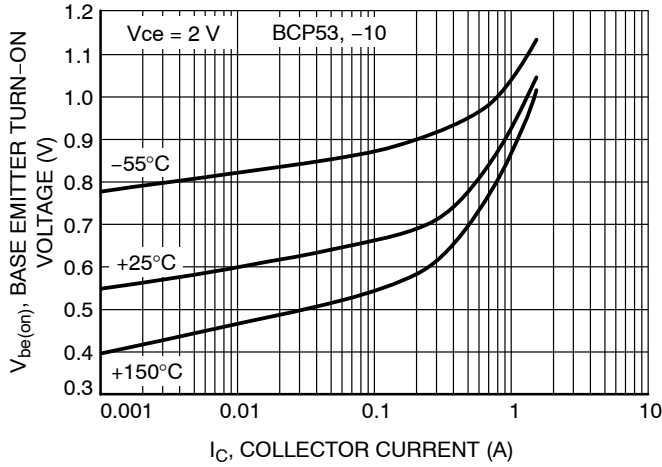
**Figure 5. BCP53, -10 Base Emitter Saturation Voltage vs. Collector Current**



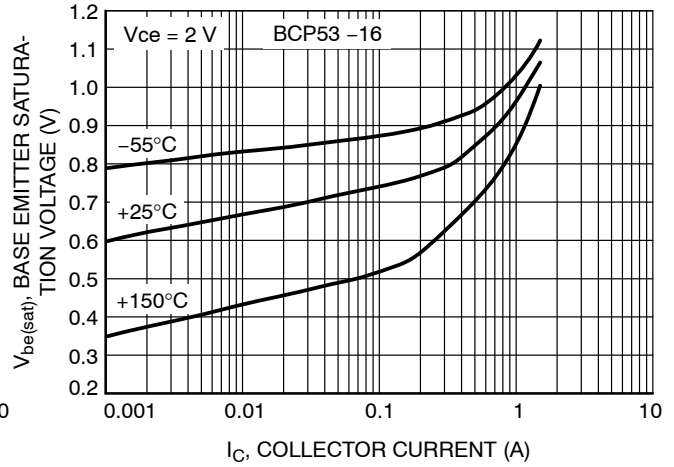
**Figure 6. BCP53-16 Base Emitter Saturation Voltage vs. Collector Current**

# BCP53 Series, SBCP53 Series

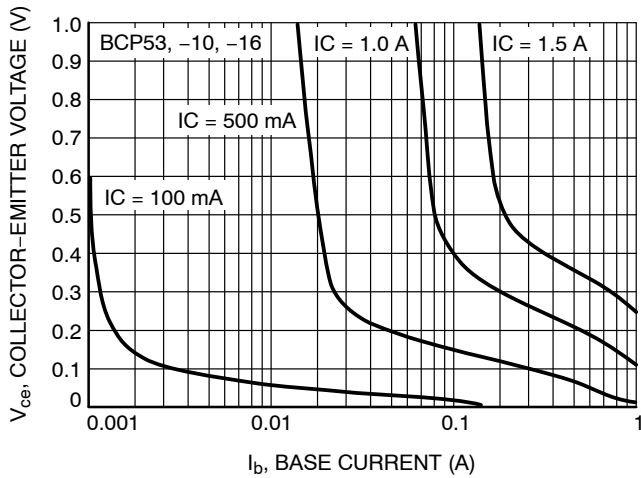
## TYPICAL CHARACTERISTICS



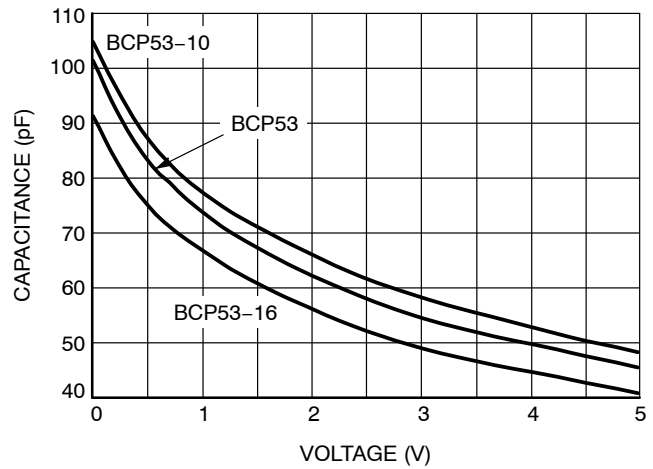
**Figure 7. BCP53, -10 Base Emitter Turn-On Voltage vs. Collector Current  $V_{BE(on)}$**



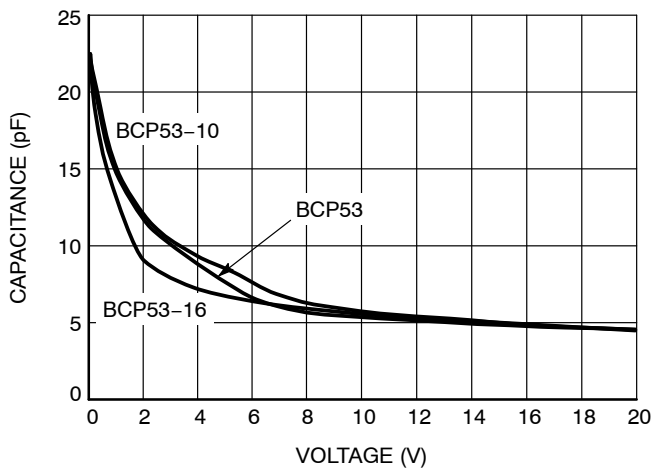
**Figure 8. BCP53-16 Base Emitter Turn-On Voltage vs. Collector Current**



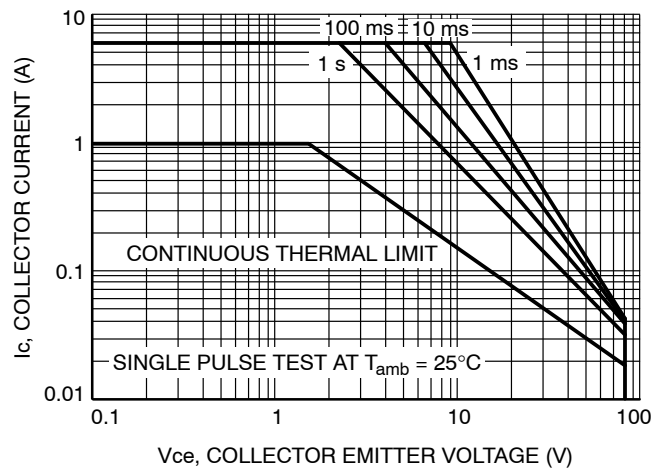
**Figure 9. BCP53, -10, -16 Saturation Region**



**Figure 10. Input Capacitance**



**Figure 11. Output Capacitance**

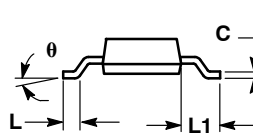
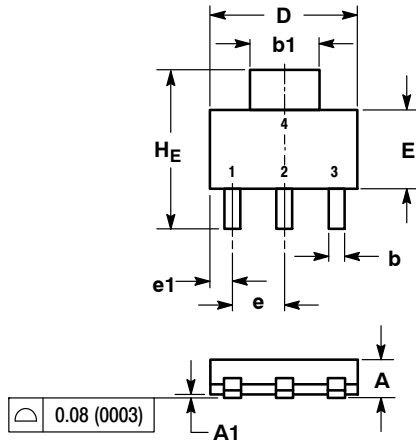


**Figure 12. Standard Operating Area**

# BCP53 Series, SBCP53 Series

## PACKAGE DIMENSIONS

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

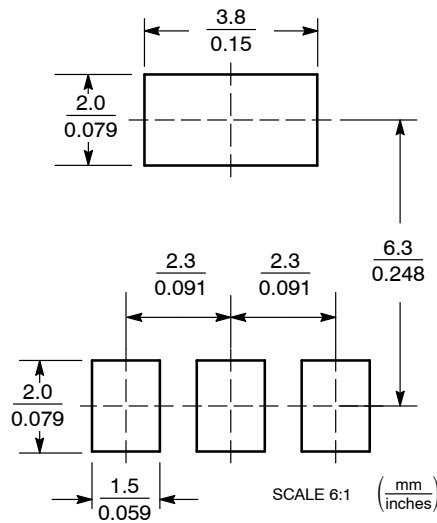


NOTES:  
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.  
2. CONTROLLING DIMENSION: INCH

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
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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