

# BCX56-10R1

Preferred Device

## NPN Silicon Epitaxial Transistor

These NPN Silicon Epitaxial transistors are designed for use in audio amplifier applications. The device is housed in the SOT-89 package, which is designed for medium power surface mount applications.

- High Current: 1.0 Amp
- Available in 7 inch/1000 unit Tape and Reel
- Device Marking: BK

### MAXIMUM RATINGS (T<sub>C</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	80	Vdc
Collector-Base Voltage	V <sub>CB0</sub>	100	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	5	Vdc
Collector Current	I <sub>C</sub>	1	Adc
Total Power Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub> (Note 1.)	1.56	Watts
		13	mW/°C
	(Note 2.)	0.67	Watts
		5.0	mW/°C
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-65 to 150	°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction-to-Ambient (surface mounted)	R <sub>θJA</sub> (Note 1.)	80	°C/W
	(Note 2.)	190	
Maximum Temperature for Soldering Purposes Time in Solder Bath	T <sub>L</sub>	260	°C
		10	Sec

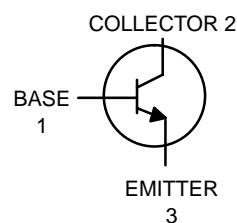
1. FR-4 @ 1.0 X 1.0 inch Pad
2. FR-4 @ Minimum Pad



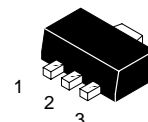
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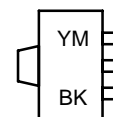
## MEDIUM POWER NPN SILICON HIGH CURRENT TRANSISTOR SURFACE MOUNT



### MARKING DIAGRAM



SOT-89  
CASE 1213  
STYLE 2



Y = Year Code  
M = Month Code  
BK = Device Code

### ORDERING INFORMATION

Device	Package	Shipping
BCX56-10R1	SOT-89	1000/Tape & Reel

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

# BCX56-10R1

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

Characteristics	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
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
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	nAdc
Emitter-Base Cutoff Current ( $V_{EB} = 5.0 \text{Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	–	10	$\mu\text{Adc}$

## ON CHARACTERISTICS (Note 3.)

DC Current Gain ( $I_C = 5.0 \text{mA}$ , $V_{CE} = 2.0 \text{V}$ ) ( $I_C = 150 \text{mA}$ , $V_{CE} = 2.0 \text{V}$ ) ( $I_C = 500 \text{mA}$ , $V_{CE} = 2.0 \text{V}$ )	$h_{FE}$	25 63 25	– – –	– 160 –	–
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 ( $I_C = 10 \text{mA}$ , $V_{CE} = 5.0 \text{Vdc}$ , $f = 35 \text{MHz}$ )	$f_T$	–	130	–	MHz
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3. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

## TYPICAL ELECTRICAL CHARACTERISTICS

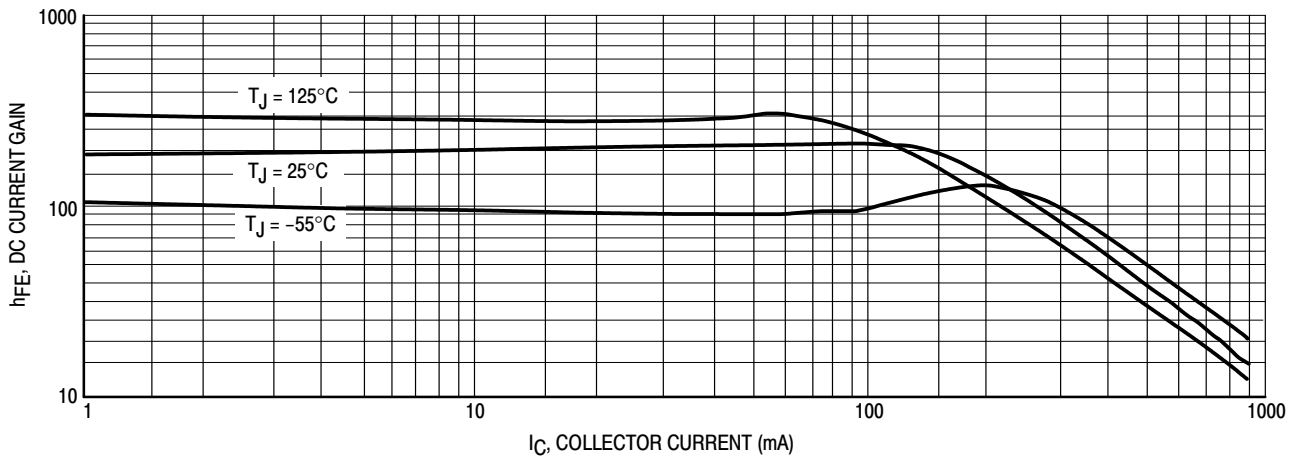


Figure 1. DC Current Gain

TYPICAL ELECTRICAL CHARACTERISTICS

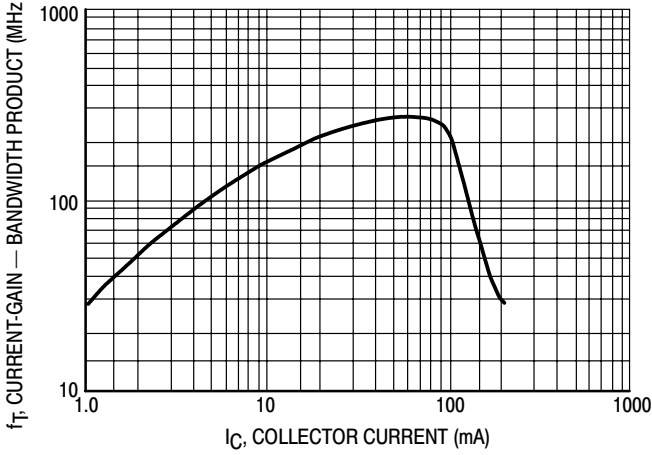


Figure 2. Current-Gain – Bandwidth Product

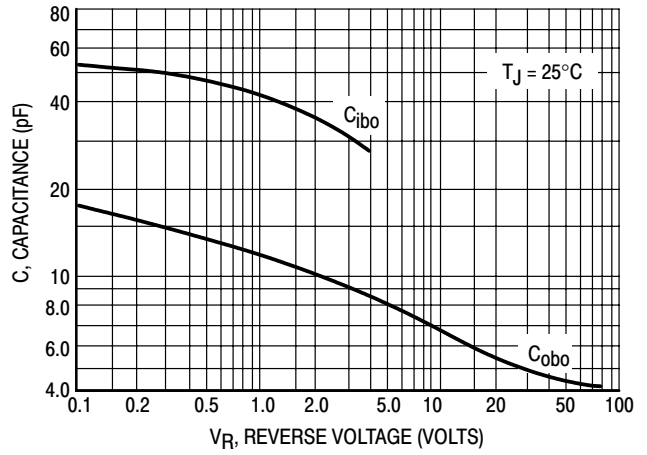


Figure 3. Capacitance

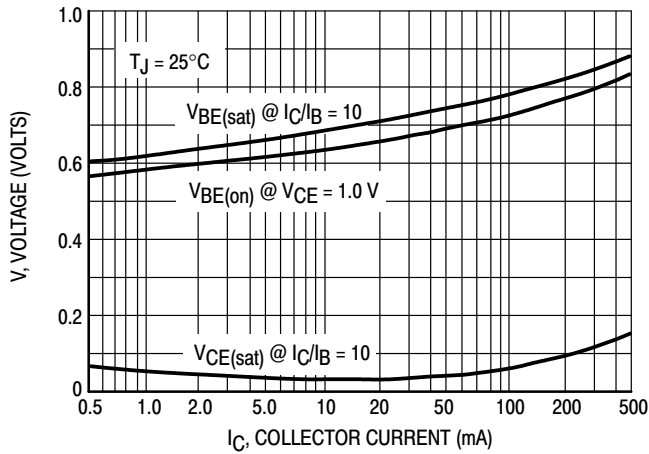


Figure 4. "On" Voltages

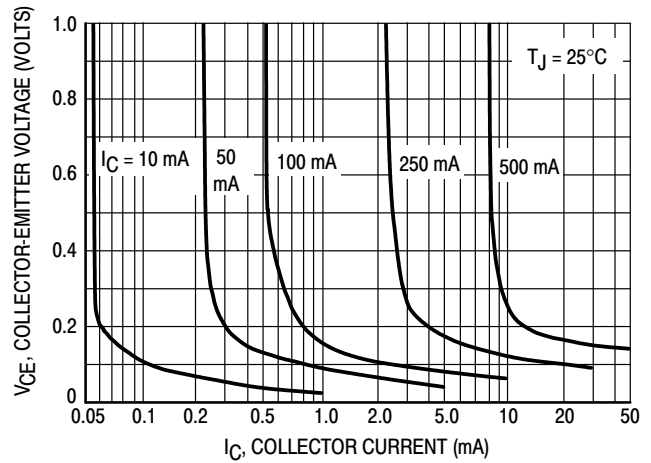


Figure 5. Collector Saturation Region

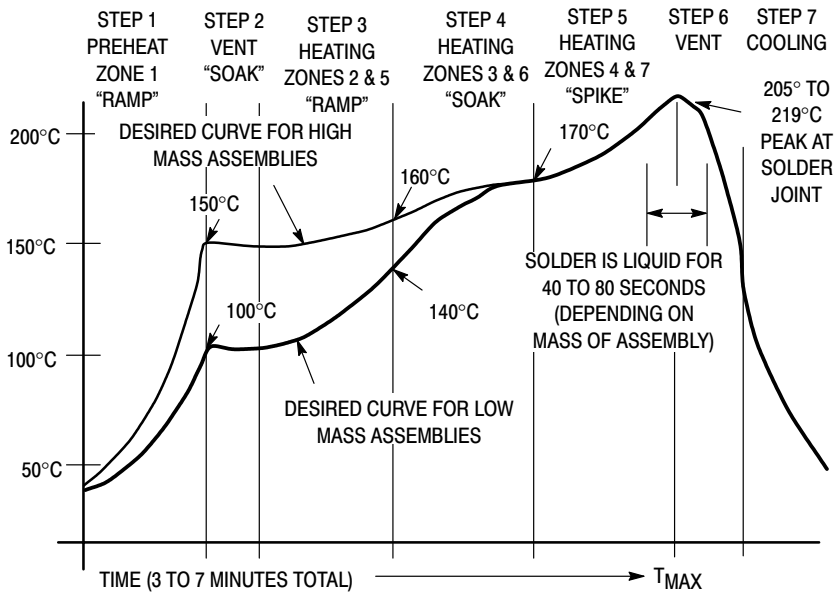
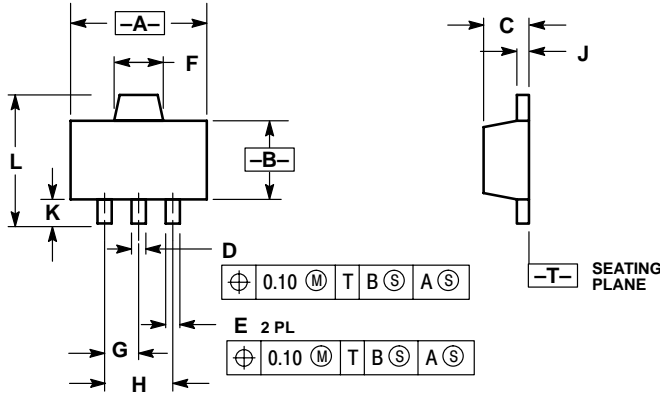


Figure 6. Typical Solder Heating Profile

# BCX56-10R1

## PACKAGE DIMENSIONS

SOT-89  
(3-LEAD)  
CASE 1213-02  
ISSUE C




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. 1213-01 OBSOLETE, NEW STANDARD 1213-02.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.60	0.173	0.181
B	2.40	2.60	0.094	0.102
C	1.40	1.60	0.055	0.063
D	0.37	0.57	0.015	0.022
E	0.32	0.52	0.013	0.020
F	1.50	1.83	0.059	0.072
G	1.50 BSC		0.059 BSC	
H	3.00 BSC		0.118 BSC	
J	0.30	0.50	0.012	0.020
K	0.80	---	0.031	---
L	---	4.25	---	0.167

STYLE 2:

1. BASE
2. COLLECTOR
3. EMITTER

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