

# 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 ( $T_C = 25^\circ\text{C}$ 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	Vdc
Collector Current	$I_C$	1	Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$ (Note 1)	1.56	Watts
		13	mW/ $^\circ\text{C}$
		0.67	Watts
	(Note 2)	5.0	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)	$R_{\theta JA}$ (Note 1) (Note 2)	80	$^\circ\text{C}/\text{W}$
		190	
Maximum Temperature for Soldering Purposes Time in Solder Bath	$T_L$	260 10	$^\circ\text{C}$ Sec

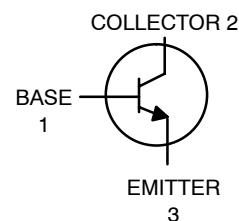
1. FR-4 @ 1.0 X 1.0 inch Pad
2. FR-4 @ Minimum Pad



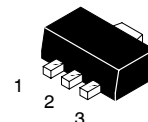
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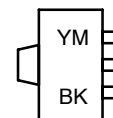
### MEDIUM POWER NPN SILICON HIGH CURRENT TRANSISTOR SURFACE MOUNT



### 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
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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
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	$\mu\text{A}$ dc

### 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

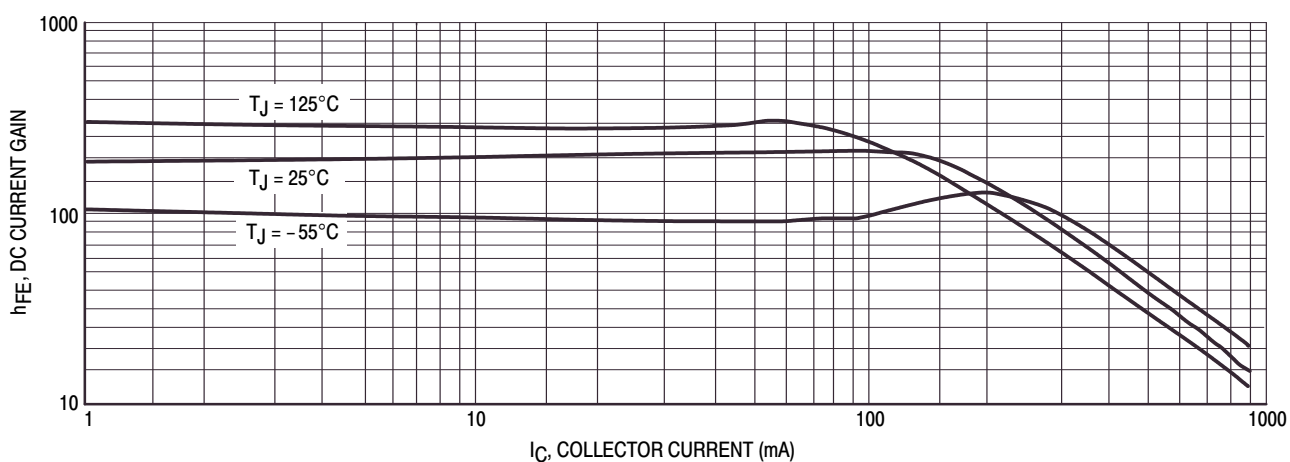


Figure 1. DC Current Gain

TYPICAL ELECTRICAL CHARACTERISTICS

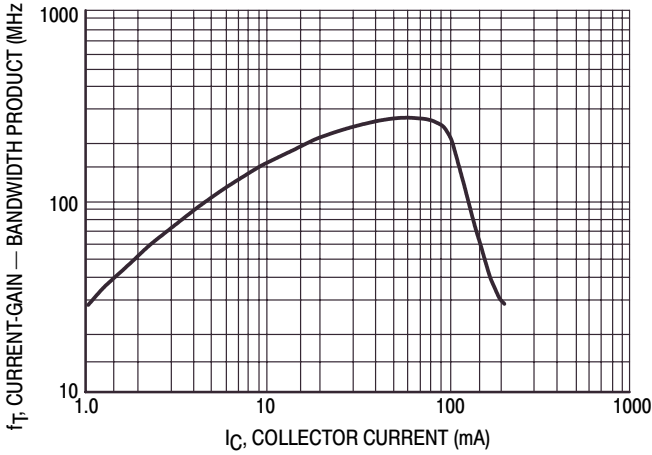


Figure 2. Current-Gain - Bandwidth Product

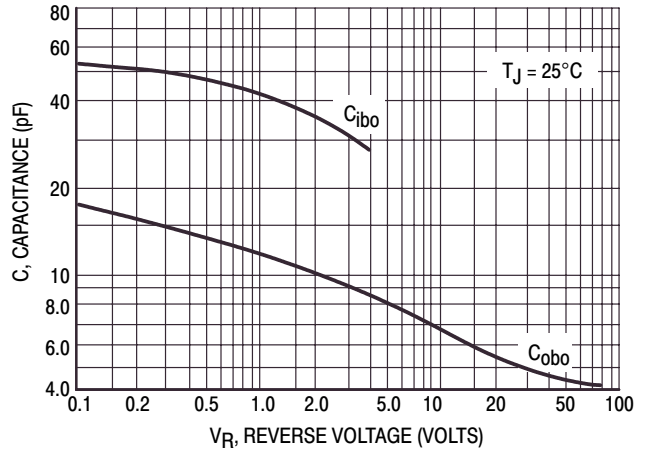


Figure 3. Capacitance

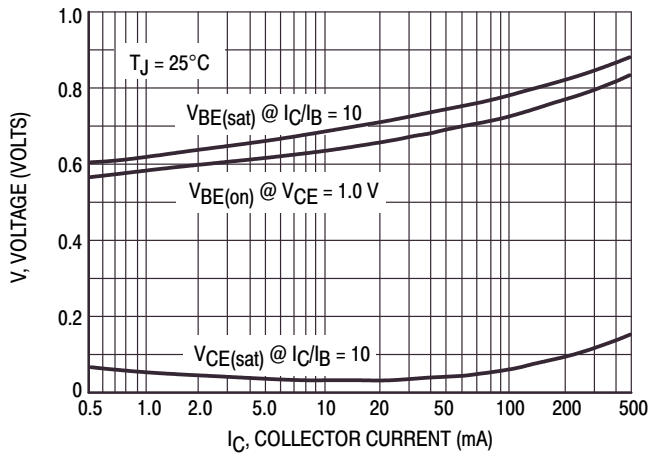


Figure 4. "On" Voltages

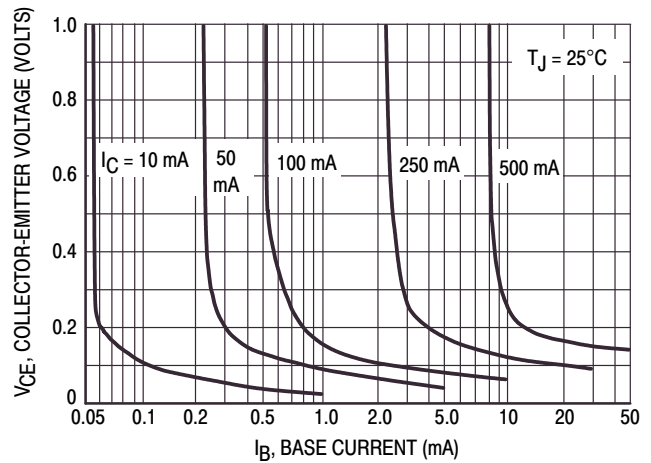


Figure 5. Collector Saturation Region

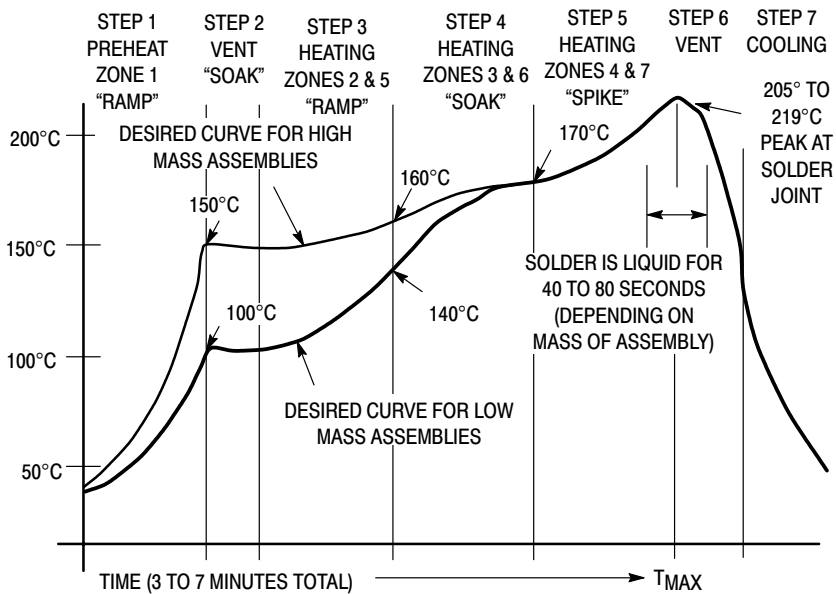


Figure 6. Typical Solder Heating Profile