

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°C	P_D (Note 1.) (Note 2.)	1.56	Watts
		13	mW/ $^\circ\text{C}$
		0.67	Watts
	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	$^\circ\text{C}$
		10	Sec

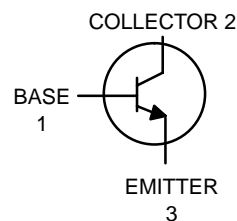
1. FR-4 @ 1.0 X 1.0 inch Pad
2. FR-4 @ Minimum Pad



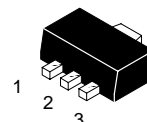
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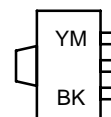
MEDIUM POWER NPN SILICON HIGH CURRENT TRANSISTOR SURFACE MOUNT



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
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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	μA 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

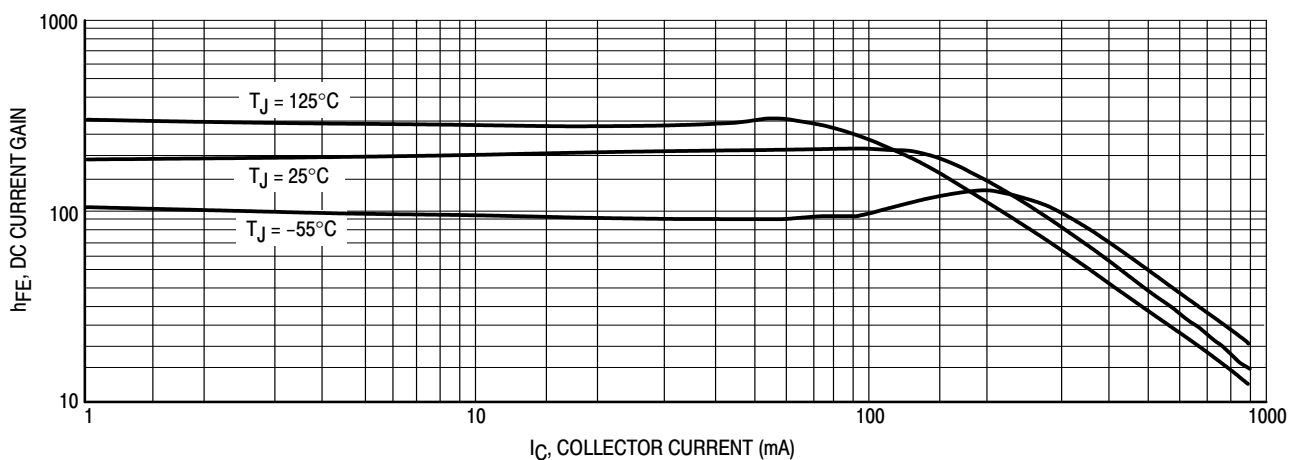


Figure 1. DC Current Gain

TYPICAL ELECTRICAL CHARACTERISTICS

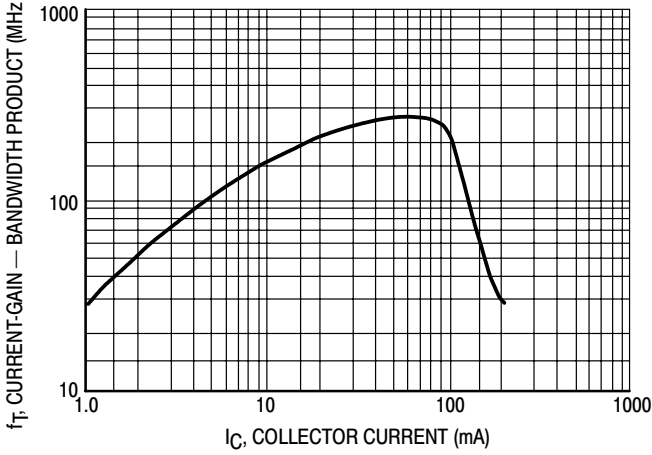


Figure 2. Current-Gain – Bandwidth Product

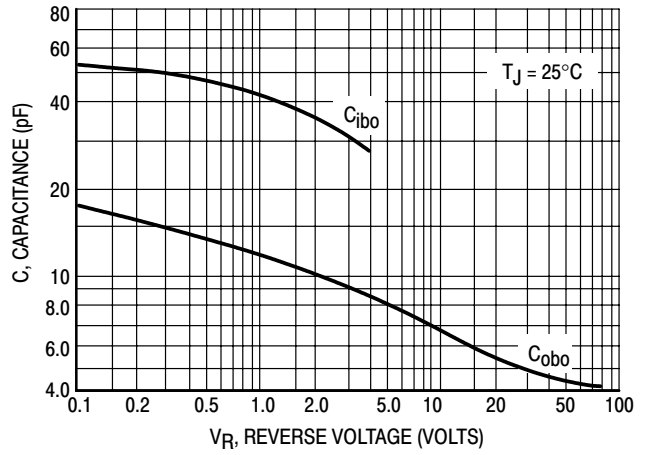


Figure 3. Capacitance

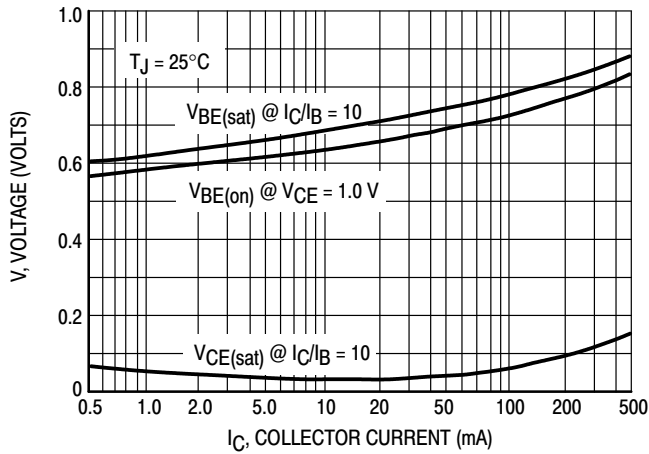


Figure 4. "On" Voltages

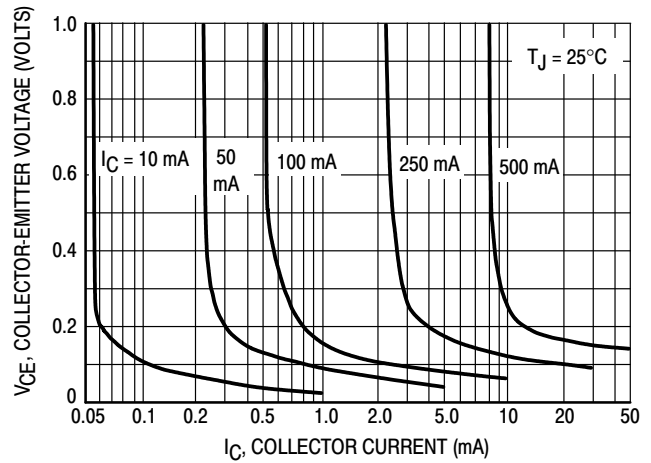


Figure 5. Collector Saturation Region

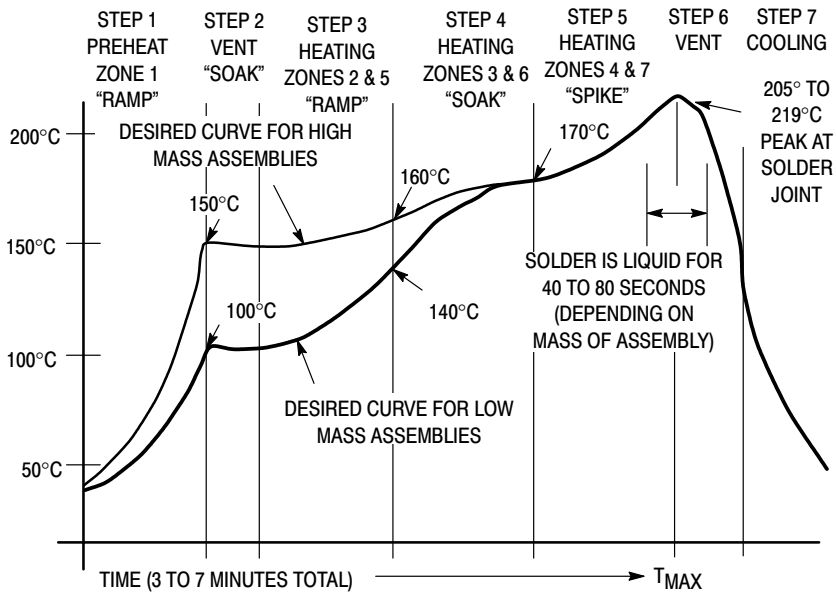
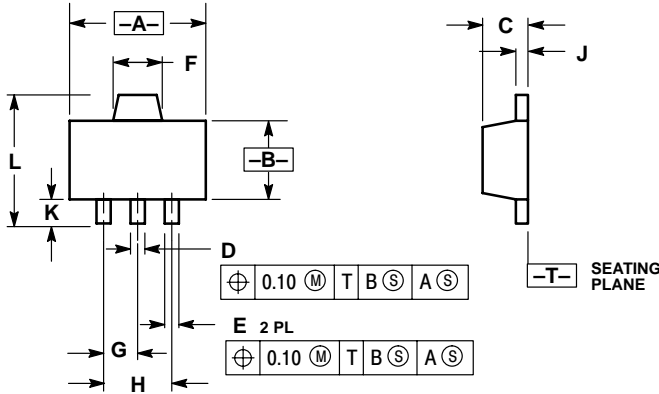


Figure 6. Typical Solder Heating Profile

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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