PNP SILICON PLANAR MEDIUM POWER TRANSISTORS IN SOT89

Features

- I_C = -1A Continuous Collector Current
- Low Saturation Voltage $V_{CE(sat)}$ < -500mV @ -0.5A
- Gain groups 10 and 16
- Epitaxial Planar Die Construction
- Complementary NPN types: BCX54, 55, and 56
- **Lead-Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Devices (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

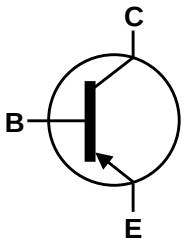
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound (Note 2)
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.072 grams (Approximate)

Applications

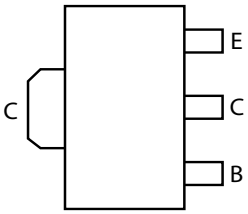
- Medium Power Switching or Amplification Applications
- AF driver and output stages

SOT89

Top View



Device Symbol



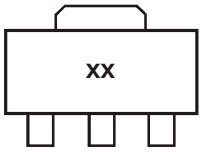
Top View
Pin-Out

Ordering Information (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BCX51TA	AA	7	12	1,000
BCX5110TA	AC	7	12	1,000
BCX5116TA	AD	7	12	1,000
BCX52TA	AE	7	12	1,000
BCX5210TA	AG	7	12	1,000
BCX5216TA	AM	7	12	1,000
BCX53TA	AH	7	12	1,000
BCX5310TA	AK	7	12	1,000
BCX5316TA	AL	7	12	1,000
BCX5316TC	AL	13	12	4,000
BCX5316-13R	AL	13	12	4,000

Notes:
1. No purposefully added lead.
2. Diodes Inc's "Green" Policy can be found on our website at http://www.diodes.com
3. For packaging details, go to our website http://www.diodes.com

Marking Information



xx = Product Type Marking Code, as follows:

BCX51 = AA	BCX52 = AE	BCX53 = AH
BCX5110 = AC	BCX5210 = AG	BCX5310 = AK
BCX5116 = AD	BCX5316 = AM	BCX5316 = AL

Maximum Ratings @ T_A = 25°C unless otherwise specified

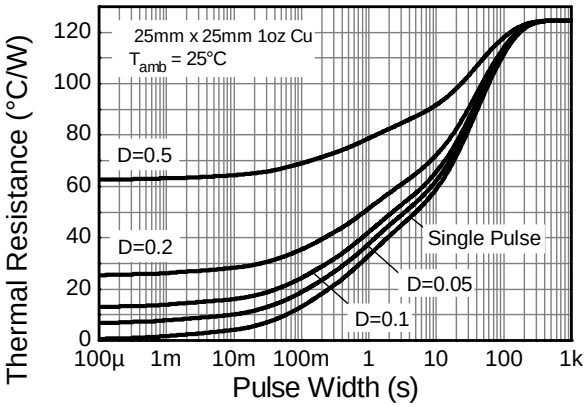
Characteristic	Symbol	BCX51	BCX52	BCX53	Unit
Collector-Base Voltage	V_{CBO}	-45	-60	-100	V
Collector-Emitter Voltage	V_{CEO}	-45	-60	-80	V
Emitter-Base Voltage	V_{EBO}	-5			V
Continuous Collector Current	I_C	-1			A
Peak Pulse Collector Current	I_{CM}	-1.5			
Continuous Base Current	I_B	-100			mA
Peak Pulse Base Current	I_{BM}	-200			

Thermal Characteristics @ T_A = 25°C unless otherwise specified

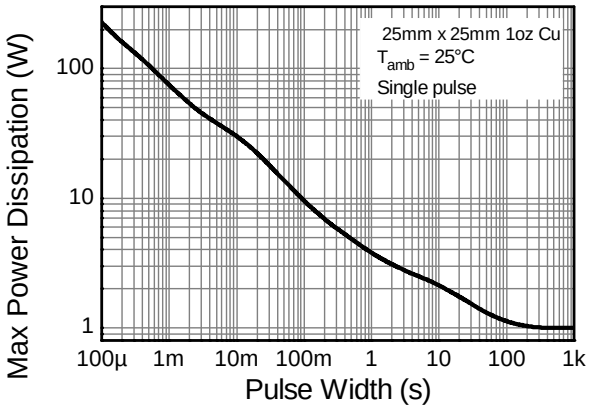
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P_D	1	W
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	124	°C/W
Thermal Resistance, Junction to Leads (Note 5)	$R_{\theta JL}$	10.0	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

Notes: 4. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
5. Thermal resistance from junction to solder-point (on the exposed collector pad).

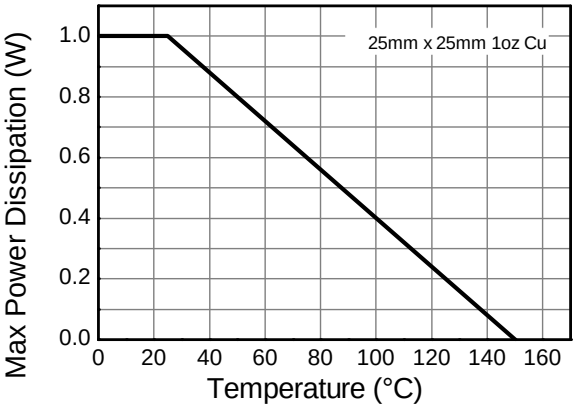
Thermal Characteristics



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

Electrical Characteristics @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BCX51	BV_{CBO}	-45	-	-	V	I_C = -100µA
	BCX52		-60				
	BCX53		-100				
Collector-Emitter Breakdown Voltage (Note 6)	BCX51	BV_{CEO}	-45	-	-	V	I_C = -10mA
	BCX52		-60				
	BCX53		-80				
Emitter-Base Breakdown Voltage		BV_{EBO}	-5	-	-	V	I_E = -10µA
Collector Cut-off Current		I_{CBO}	-	-	-0.1 -20	µA	V_{CB} = -30V V_{CB} = -30V, T_A = 150°C
Emitter Cut-off Current		I_{EBO}	-	-	-20	nA	V_{EB} = -4V
Static Forward Current Transfer Ratio (Note 6)	All versions	h_{FE}	25 40 25	- - -	- 250 -		I_C = -5mA, V_{CE} = -2V I_C = -150mA, V_{CE} = -2V I_C = -500mA, V_{CE} = -2V
	10 gain grp		63	-	160		I_C = -150mA, V_{CE} = -2V
	16 gain grp		100	-	250		I_C = -150mA, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 6)		$V_{CE(sat)}$	-	-	-0.5	V	I_C = -500mA, I_B = -50mA
Base-Emitter Turn-On Voltage (Note 6)		$V_{BE(on)}$	-	-	-1.0	V	I_C = -500mA, V_{CE} = -2V
Transition Frequency		f_T	150	-	-	MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Output Capacitance		C_{obo}	-	-	25	pF	V_{CB} = -10V, f = 1MHz

Notes: 6. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

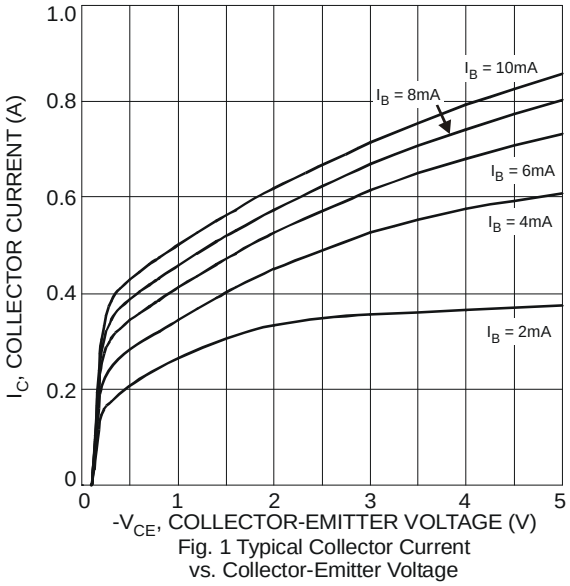


Fig. 1 Typical Collector Current vs. Collector-Emitter Voltage

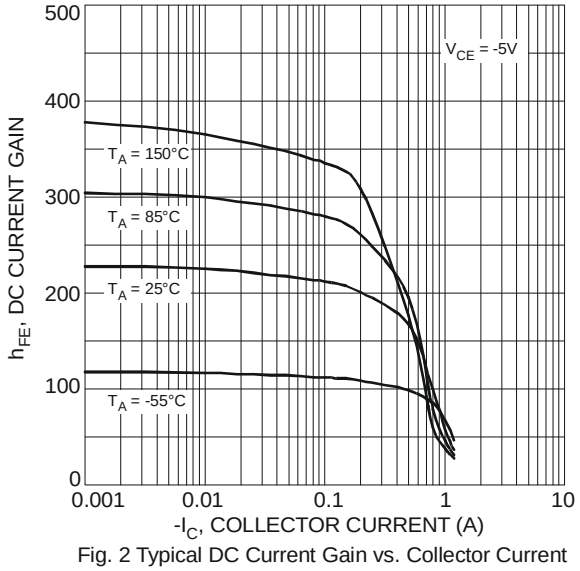


Fig. 2 Typical DC Current Gain vs. Collector Current

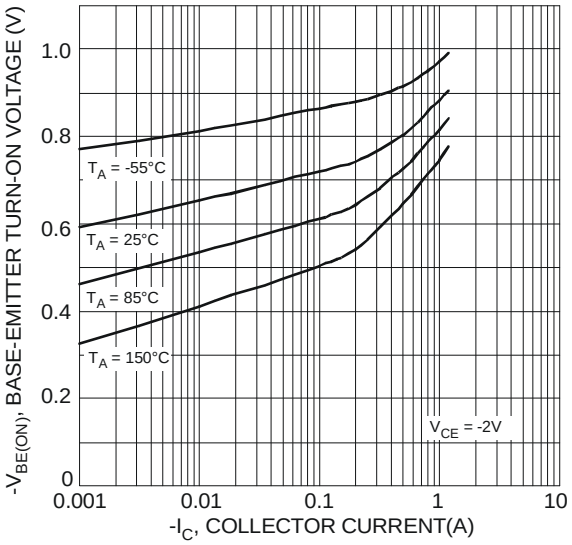


Fig 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

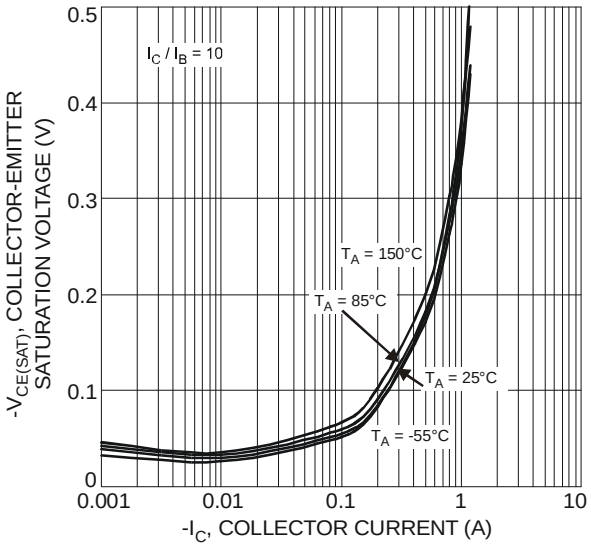


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

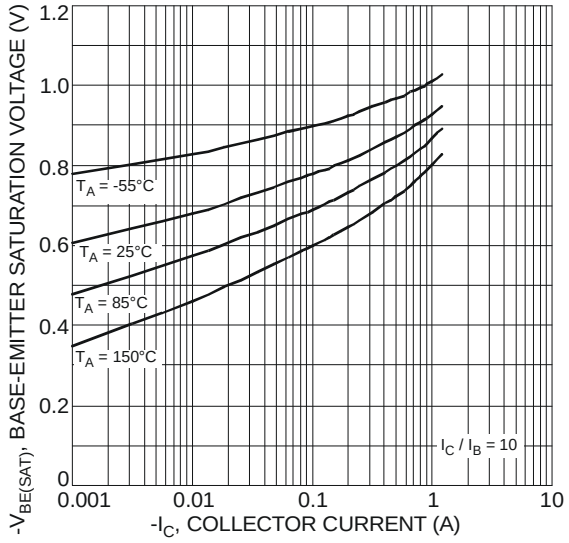


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

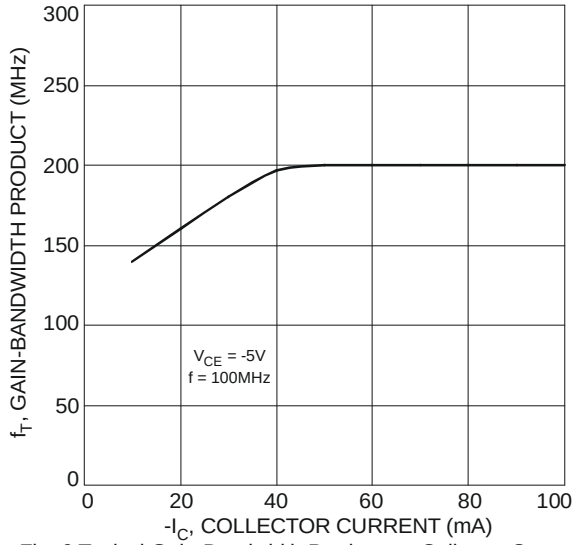


Fig. 6 Typical Gain-Bandwidth Product vs. Collector Current

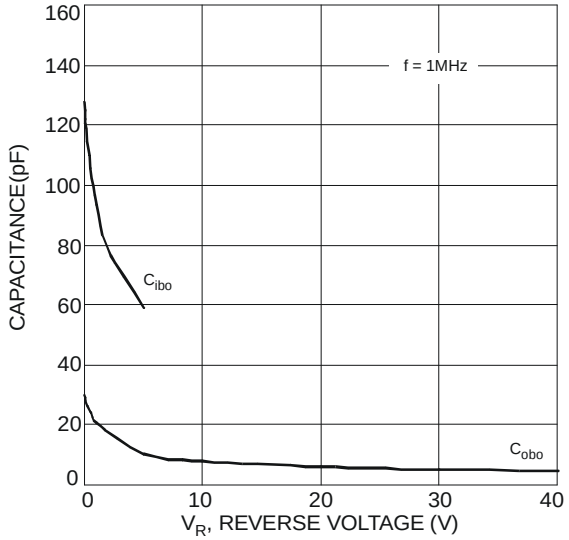
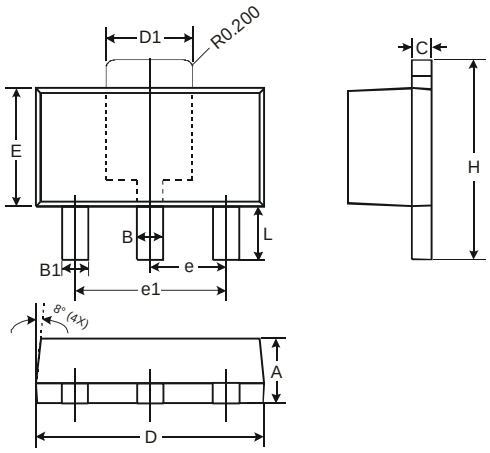


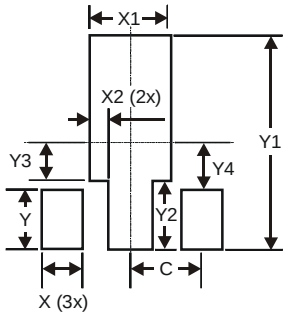
Fig. 7 Typical Capacitance Characteristics

Package Outline Dimensions



SOT89		
Dim	**Min**	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
All Dimensions in mm		

Suggested Pad Layout



Dimensions	Value (in mm)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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