NPN 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 PNP types: BCX51, 52 and 53
- **Lead-Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Devices (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

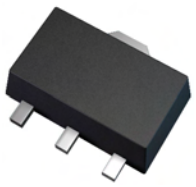
Mechanical Data

- 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)

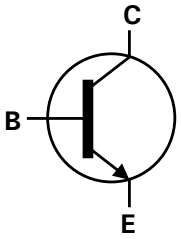
Applications

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

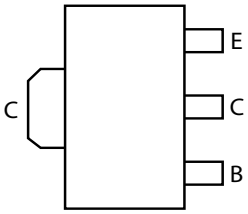
SOT89



Top View



Device Symbol



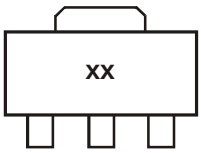
Top View
Pin-Out

Ordering Information (Note 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BCX54TA	Commercial	BA	7	12	1,000
BCX5410TA	Commercial	BC	7	12	1,000
BCX5416TA	Commercial	BD	7	12	1,000
BCX55TA	Commercial	BE	7	12	1,000
BCX5510TA	Commercial	BG	7	12	1,000
BCX5516TA	Commercial	BM	7	12	1,000
BCX56TA	Commercial	BH	7	12	1,000
BCX5610TA	Commercial	BK	7	12	1,000
BCX5616TA	Commercial	BL	7	12	1,000
BCX5616QTA	Automotive	BL	7	12	1,000
BCX5616TC	Commercial	BL	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
4. Products with Q-suffix are automotive grade. Automotive products are electrical and thermal the same as the commercial, except where specified.

Marking Information



xx = Product Type Marking Code, as follows:

BCX54 = BA	BCX55 = BE	BCX56 = BH
BCX5410 = BC	BCX5510 = BG	BCX5610 = BK
BCX5416 = BD	BCX5516 = BM	BCX5616 = BL

Maximum Ratings @ T_A = 25°C unless otherwise specified

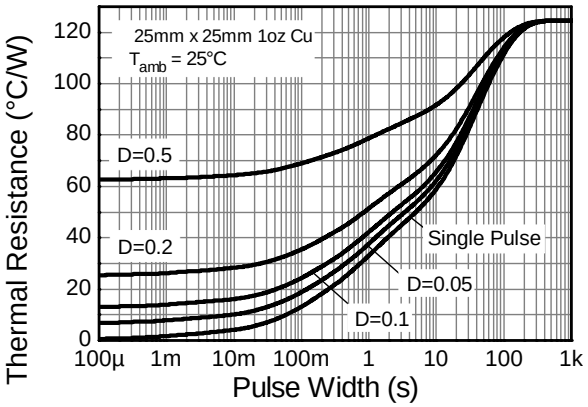
Characteristic	Symbol	BCX54	BCX55	BCX56	Unit
Collector-Base Voltage	V_{CBO}	45	60	100	V
Collector-Emitter Voltage	V_{CEO}	45	60	80	V
Emitter-Base Voltage	V_{EBO}	5			V
Continuous Collector Current	I_C	1			A
Peak Pulse Collector Current	I_{CM}	1.5			
Continuous Base Current	I_B	100			mA
Peak Pulse Base Current	I_{BM}	200			

Thermal Characteristics @ T_A = 25°C unless otherwise specified

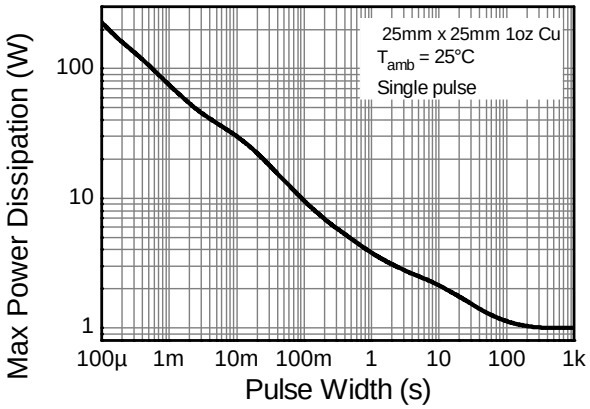
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P_D	1	W
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	124	°C/W
Thermal Resistance, Junction to Leads (Note 5)	$R_{\theta JL}$	10.0	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

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).

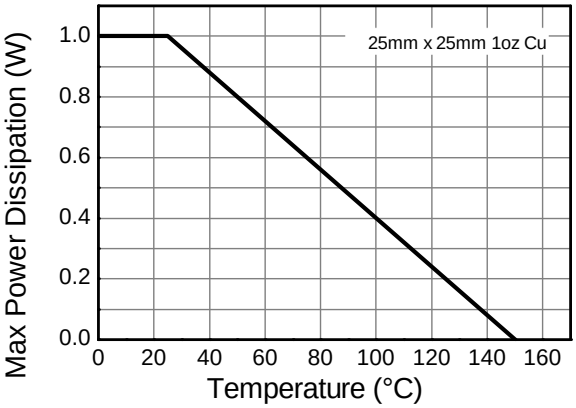
Thermal Characteristics



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	BCX54	BV_{CBO}	45	-	-	V	I_C = 100µA
	BCX55		60				
	BCX56		100				
Collector-Emitter Breakdown Voltage (Note 6)	BCX54	BV_{CEO}	45	-	-	V	I_C = 10mA
	BCX55		60				
	BCX56		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%.

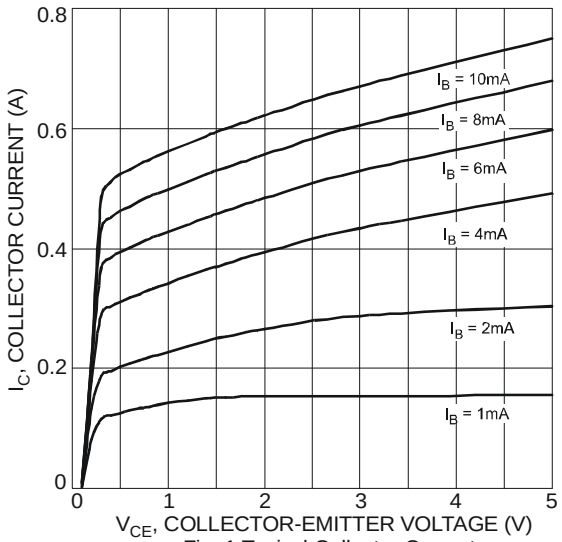


Fig. 1 Typical Collector Current vs. Collector-Emitter Voltage

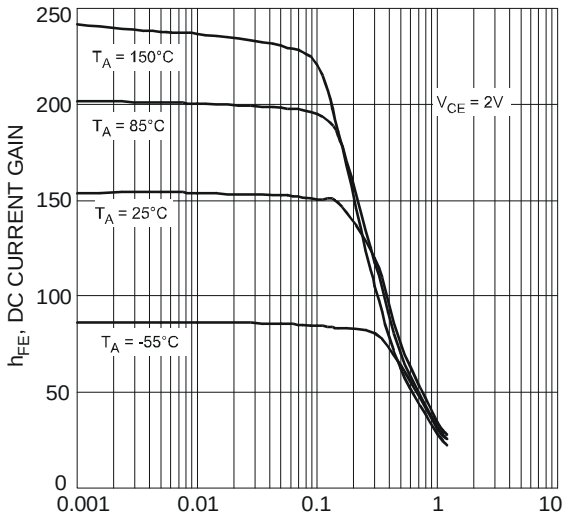


Fig. 2 Typical DC Current Gain vs. Collector Current

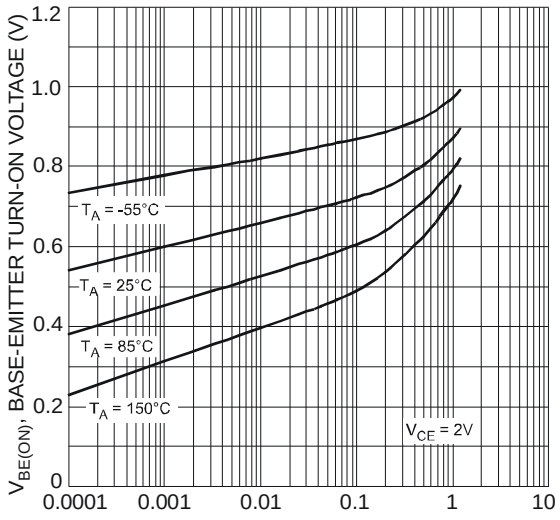


Fig. 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

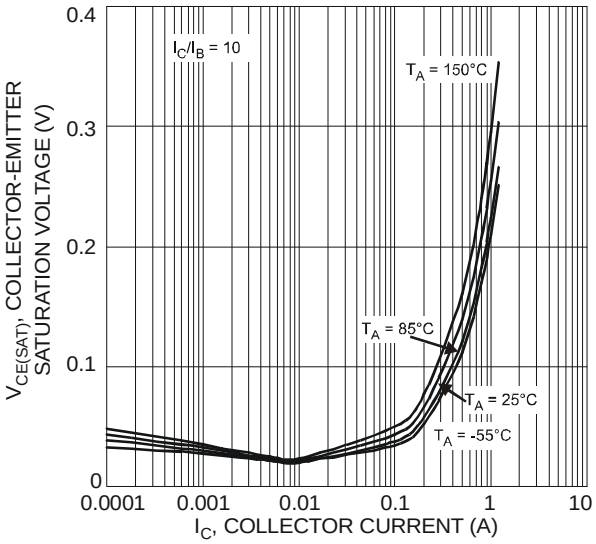


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

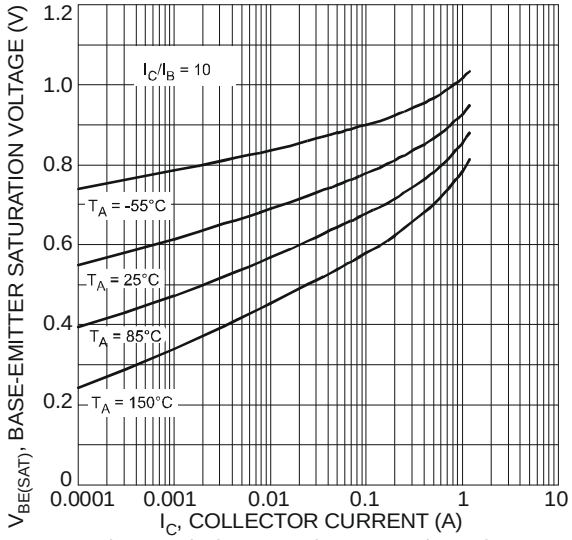


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

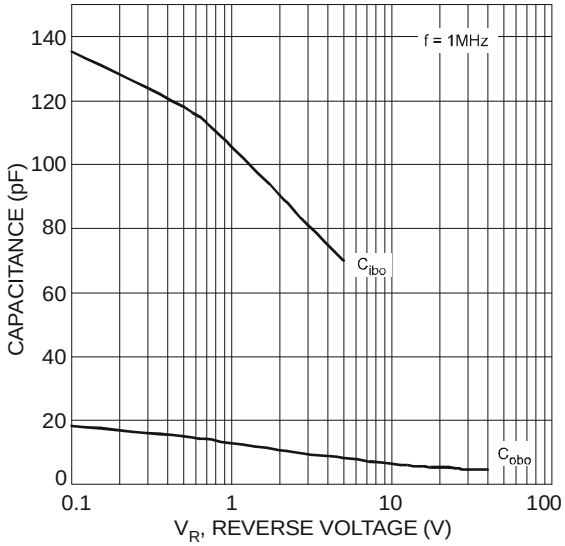


Fig. 6 Typical Capacitance Characteristics

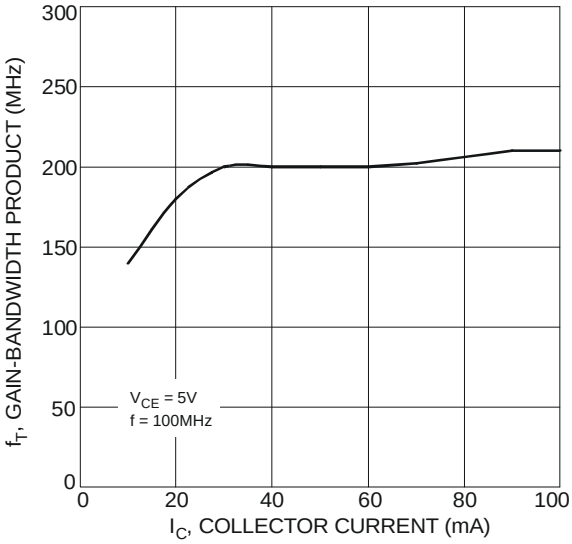
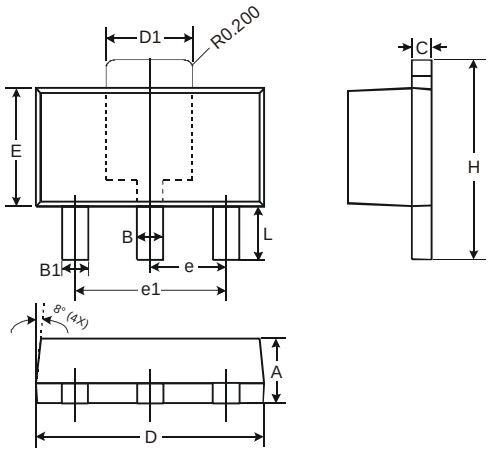


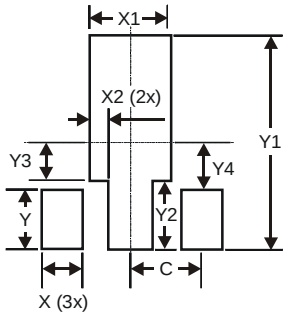
Fig. 7 Typical Gain-Bandwidth Product vs. Collector Current

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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