

**20V NPN SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT89**

**Features**

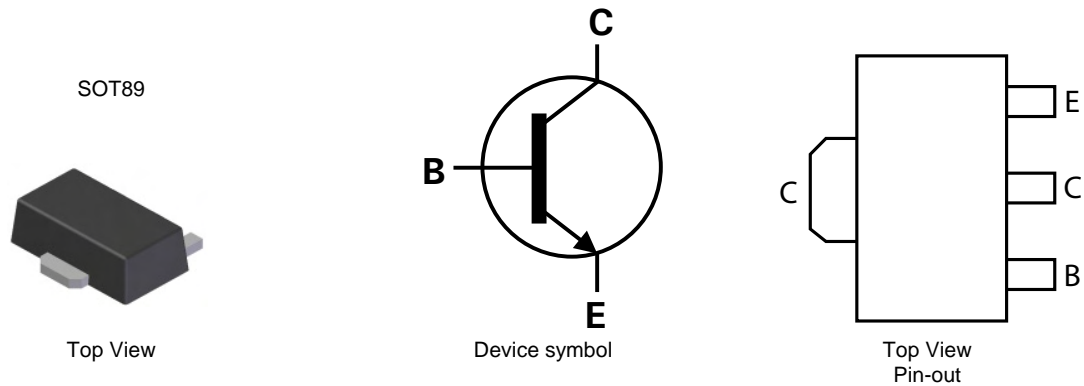
- $BV_{CE0} > 20V$
- High current capability Maximum Continuous Current  $I_C = 1A$
- Low saturation voltage  $V_{CE(sat)} < 500mV @ 1A$
- Complementary PNP type: BCX69
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free, "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound
- Moisture Sensitivity: Level 1 per J-STD-020
- UL Flammability Rating 94V-0
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (Approximate)

**Application**

- Power MOSFET gate driving
- Low loss power switching

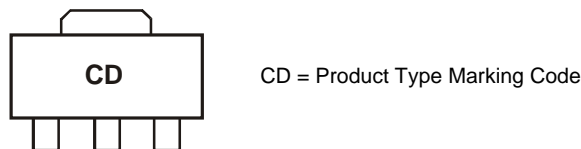


**Ordering Information** (Notes 3 & 4)

Product	Status	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BCX6825TA	Commercial	CD	7	12	1000
BCX6825QTA	Automotive	CD	7	12	1000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free.
  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 at <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**



**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

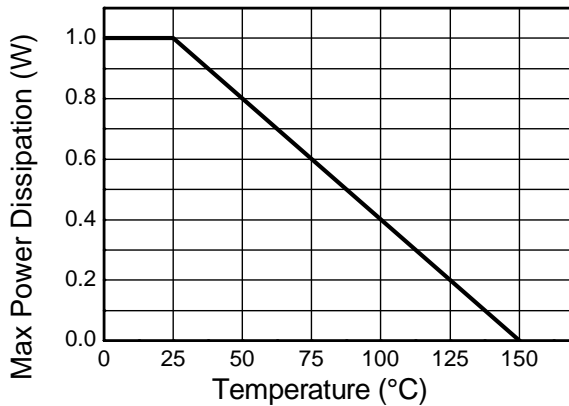
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	25	V
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Continuous Collector Current	$I_C$	1	A
Peak Pulse Current	$I_{CM}$	2	A

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

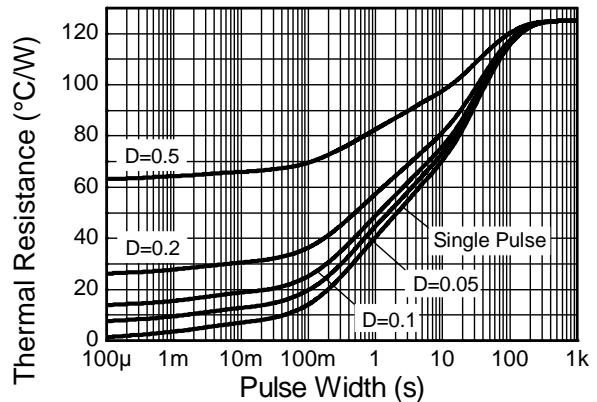
Characteristic	Symbol	Value	Unit
Collector Power Dissipation	$P_D$	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta JL}$	10.01	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

Notes: 5. For the device mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.  
6. Thermal resistance from junction to solder-point (on the exposed collector pad).

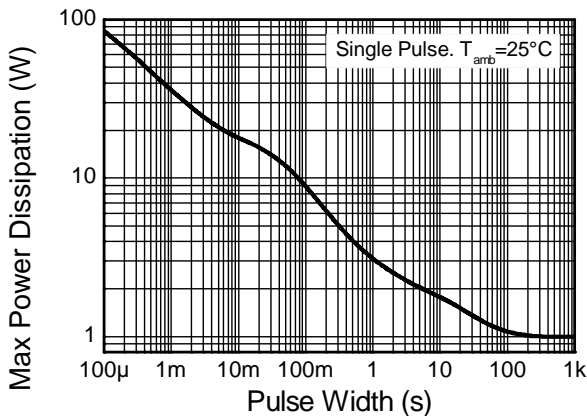
**Thermal Characteristics**



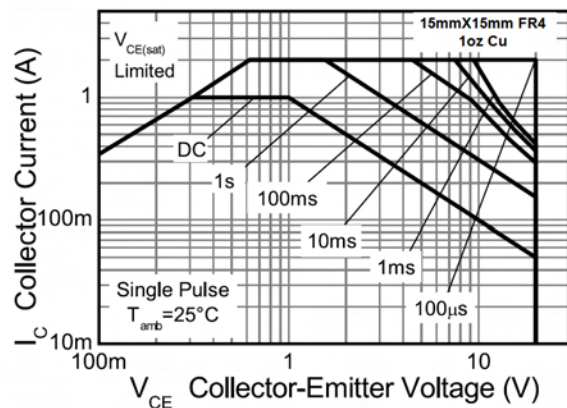
**Derating Curve**



**Transient Thermal Impedance**



**Pulse Power Dissipation**



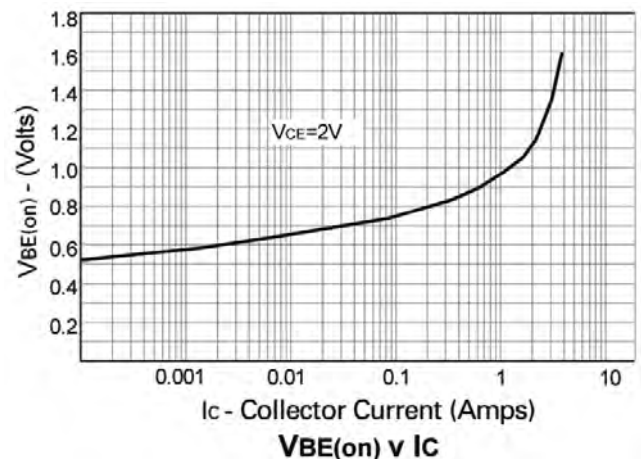
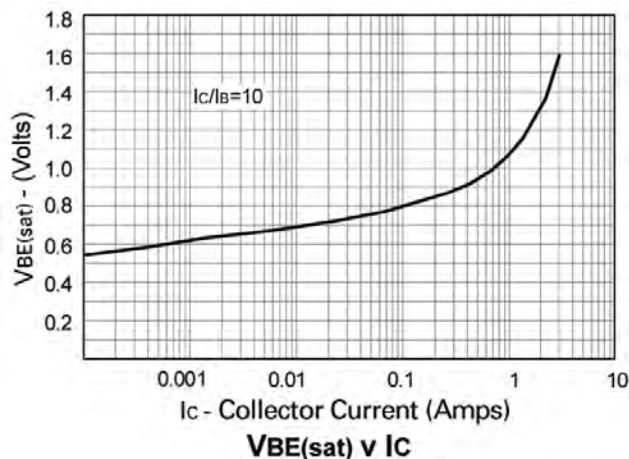
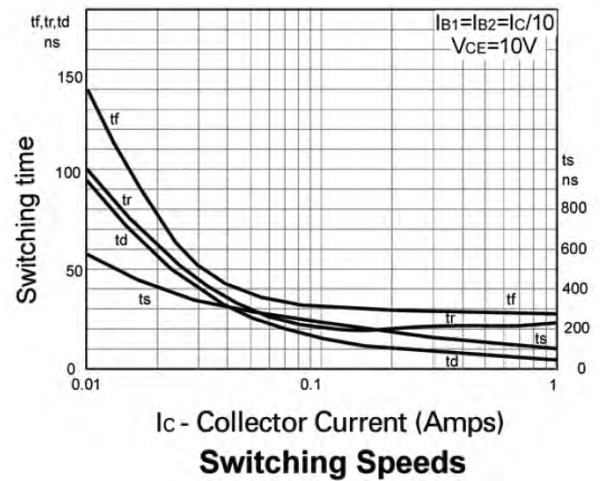
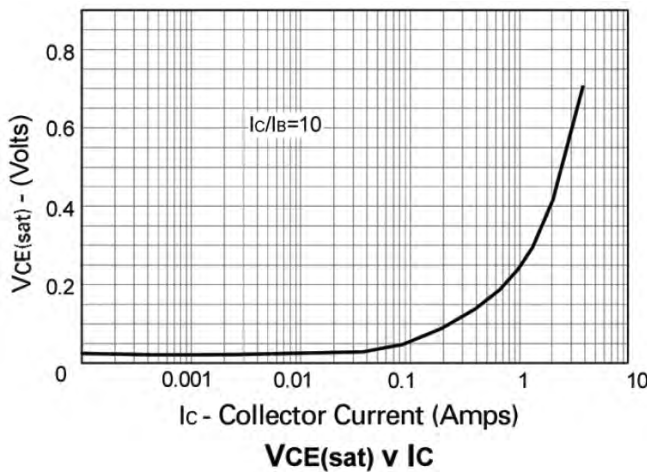
**Safe Operating Area**

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

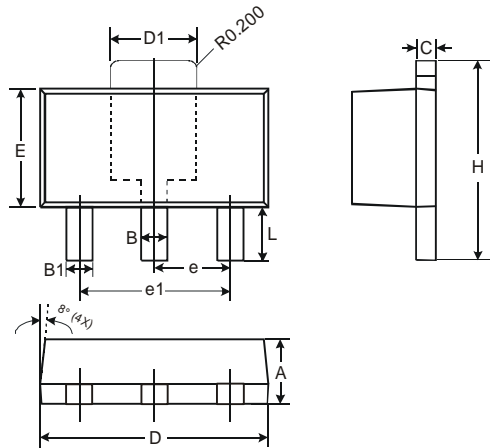
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	25	-	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	BV <sub>CEO</sub>	20	-	-	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	-	-	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CBO</sub>	-	-	100 10	nA μA	V <sub>CB</sub> = 25V V <sub>CB</sub> = 25V, T <sub>A</sub> = 125°C
Emitter Cutoff Current	I <sub>EBO</sub>	-	-	10	μA	V <sub>EB</sub> = 5V
DC current transfer Static ratio (Note 7)	h <sub>FE</sub>	50 160 60	250	- 400 -	-	I <sub>C</sub> = 5mA, V <sub>CE</sub> = 10V I <sub>C</sub> = 500mA, V <sub>CE</sub> = 1V I <sub>C</sub> = 1A, V <sub>CE</sub> = 1V
Collector-Emitter Saturation Voltage (Note 7)	V <sub>CE(sat)</sub>	-	-	0.5	V	I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA
Base-Emitter Turn-on Voltage (Note 7)	V <sub>BE(on)</sub>	-	-	1.0	V	I <sub>C</sub> = 1A, V <sub>CE</sub> = 1V
Transitional Frequency	f <sub>T</sub>	100	-	-	MHz	I <sub>C</sub> = 100mA, V <sub>CE</sub> = 5V f = 100MHz
Output capacitance	C <sub>obo</sub>	-	-	25	pF	V <sub>CB</sub> = 10V, f = 1MHz

Notes: 7. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

**Typical Characteristics**

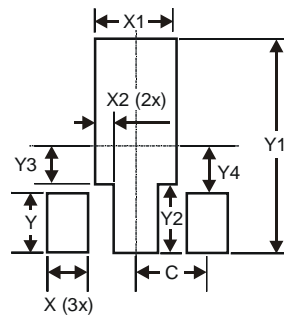


## Package Outline Dimensions



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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