

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

**Features**

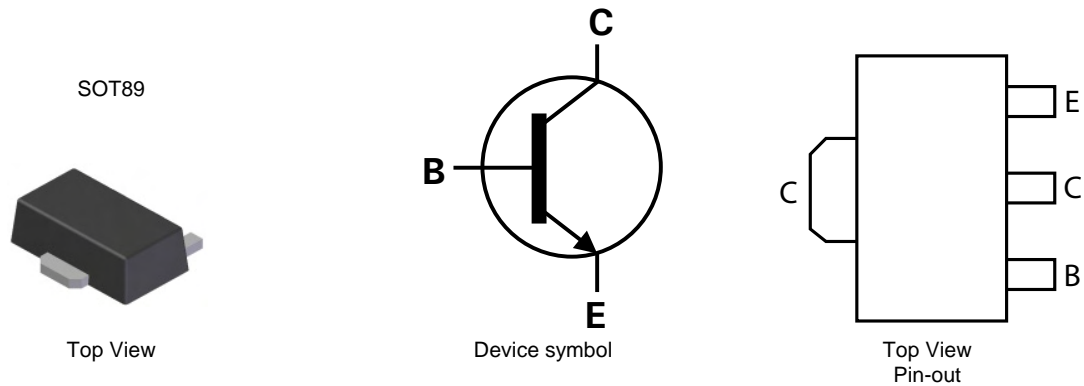
- $BV_{CE0} > 20V$
- High current capability Maximum Continuous Current  $I_C = 1A$
- Low saturation voltage  $V_{CE(sat)} < 500mV @ 1A$
- Complementary PNP type: BCX69
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free, "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards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

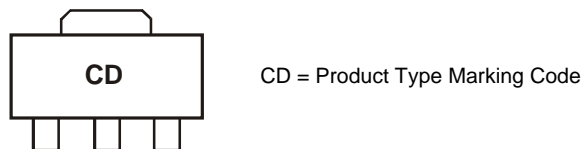


**Ordering Information** (Notes 3 & 4)

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

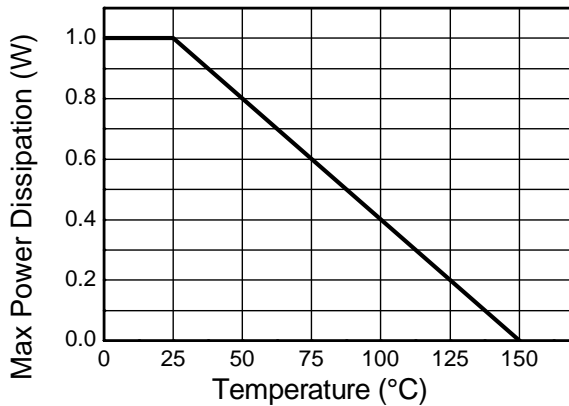
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	25	V
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Continuous Collector Current	$I_C$	1	A
Peak Pulse Current	$I_{CM}$	2	A

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

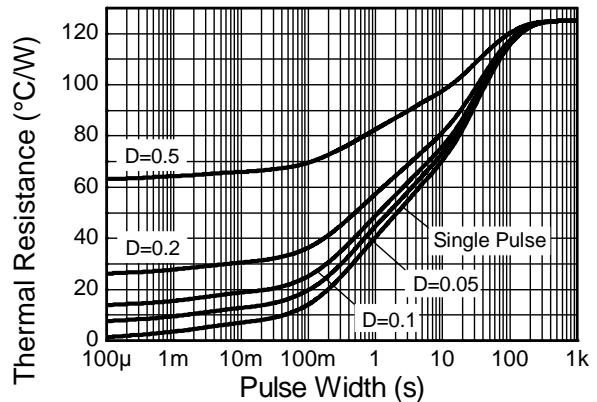
Characteristic	Symbol	Value	Unit
Collector Power Dissipation	$P_D$	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta JL}$	10.01	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$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

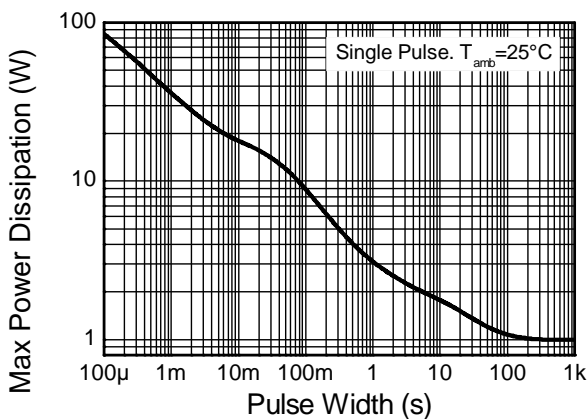
**Thermal Characteristics**



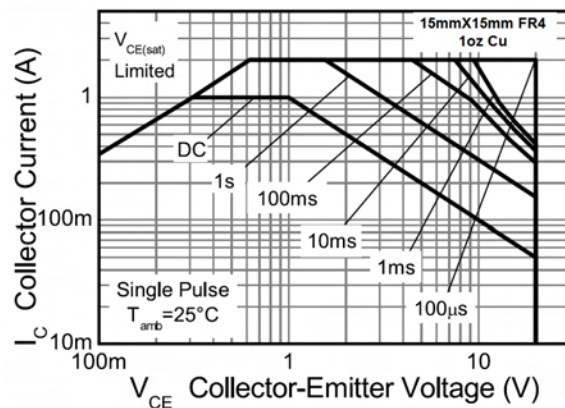
**Derating Curve**



**Transient Thermal Impedance**



**Pulse Power Dissipation**



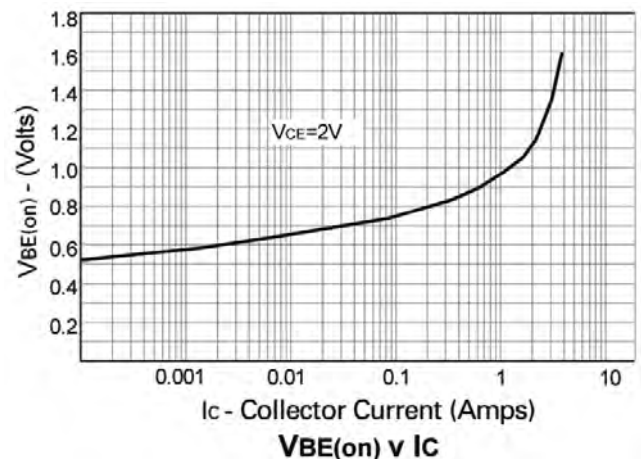
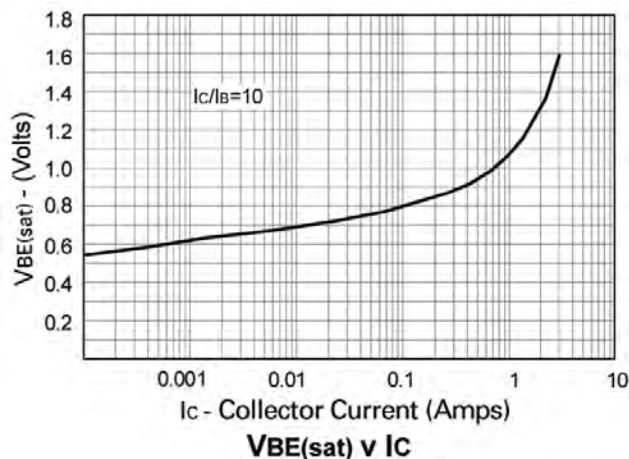
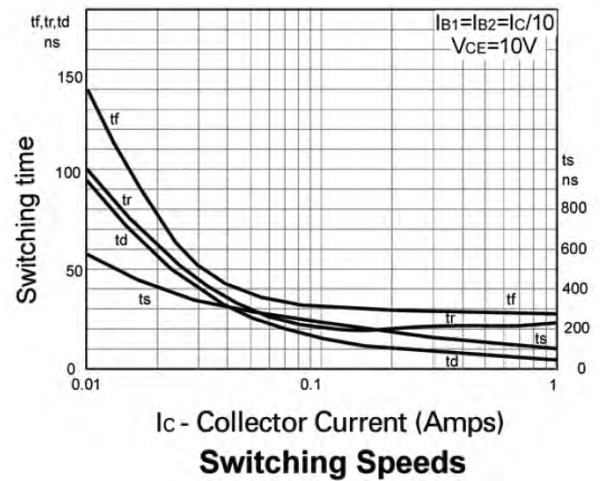
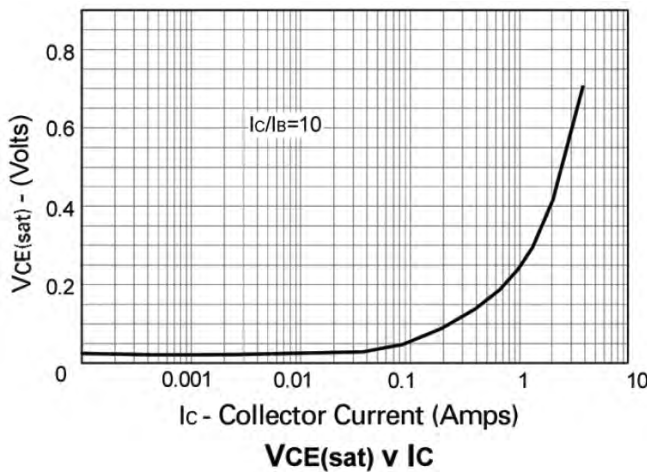
**Safe Operating Area**

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

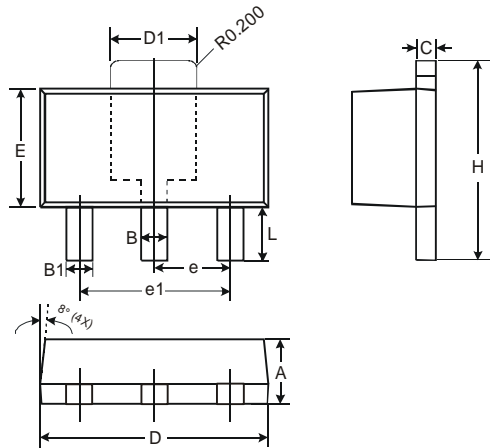
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	25	-	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 7)	$BV_{CEO}$	20	-	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	5	-	-	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	$I_{CBO}$	-	-	100 10	nA $\mu\text{A}$	$V_{CB} = 25\text{V}$ $V_{CB} = 25\text{V}, T_A = 125^\circ\text{C}$
Emitter Cutoff Current	$I_{EBO}$	-	-	10	$\mu\text{A}$	$V_{EB} = 5\text{V}$
DC current transfer Static ratio (Note 7)	$h_{FE}$	50 160 60	250	- 400 -	-	$I_C = 5\text{mA}, V_{CE} = 10\text{V}$ $I_C = 500\text{mA}, V_{CE} = 1\text{V}$ $I_C = 1\text{A}, V_{CE} = 1\text{V}$
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	-	-	0.5	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-on Voltage (Note 7)	$V_{BE(on)}$	-	-	1.0	V	$I_C = 1\text{A}, V_{CE} = 1\text{V}$
Transitional Frequency	$f_T$	100	-	-	MHz	$I_C = 100\text{mA}, V_{CE} = 5\text{V}$ $f = 100\text{MHz}$
Output capacitance	$C_{obo}$	-	-	25	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$

Notes: 7. Measured under pulsed conditions. Pulse width =  $300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Characteristics**

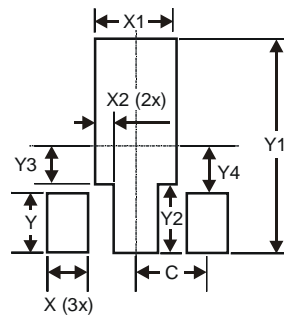


## Package Outline Dimensions



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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