

**150V NPN MEDIUM POWER TRANSISTOR IN SOT89**
**Features**

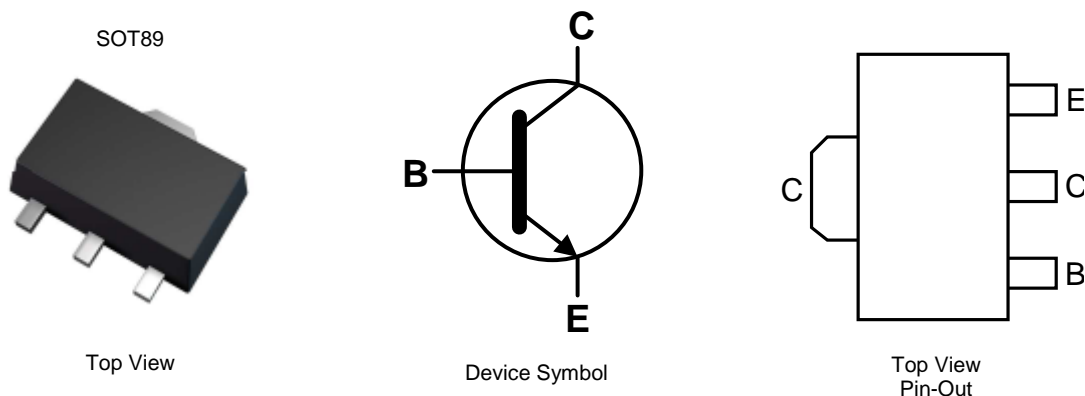
- $BV_{CEO} > 150V$
- $I_C = 1A$  High Continuous Current
- Low Saturation Voltage  $V_{CE(sat)} < 300mV @ 0.5A$
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Application**

- Low Loss Power Switching

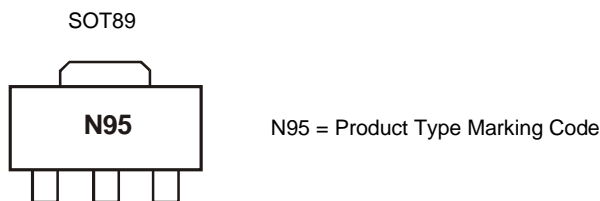
**Mechanical Data**

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208
- Weight: 0.052 grams (Approximate)


**Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX495TA	N95	7	12	1,000
FCX495TC	N95	13	12	4,000
FCX495-13R	N95	13	12	4,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen and Antimony free, "Green" and Lead-Free.
  3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**


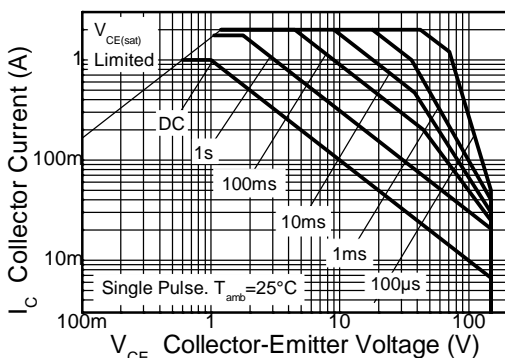
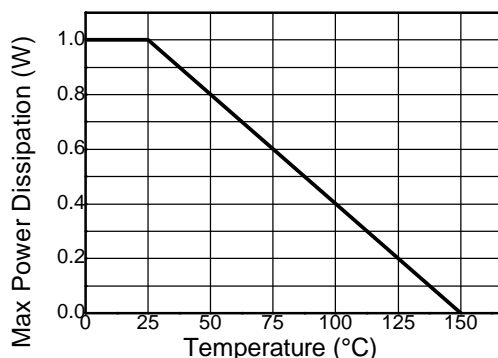
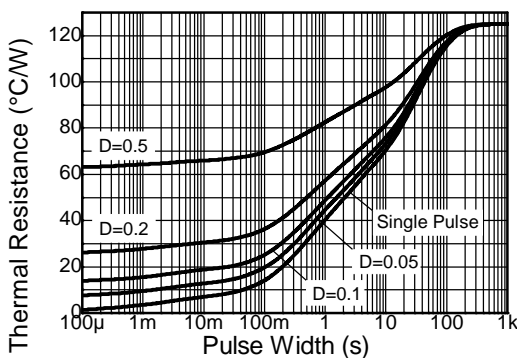
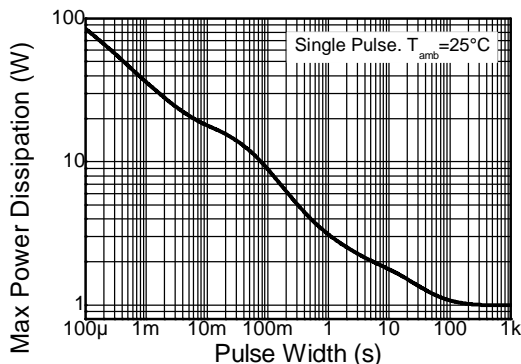
**Absolute Maximum Ratings** (@ $T_A = 25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	170	V
Collector-Emitter Voltage	$V_{CEO}$	150	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current	$I_C$	1	A
Peak Pulse Current	$I_{CM}$	2	A
Continuous Base Current	$I_B$	200	mA

**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).

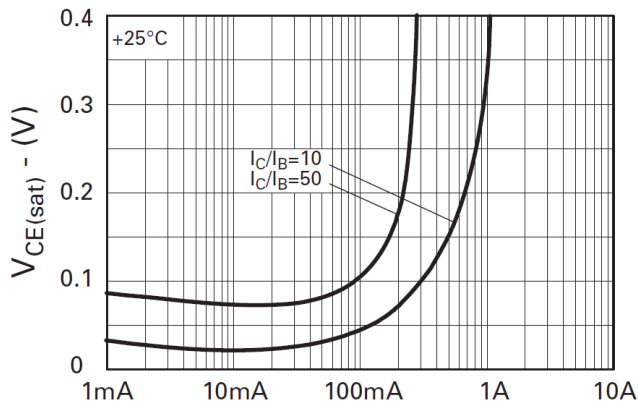
**Thermal Characteristics and Derating Information**

**Safe Operating Area**

**Derating Curve**

**Transient Thermal Impedance**

**Pulse Power Dissipation**

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

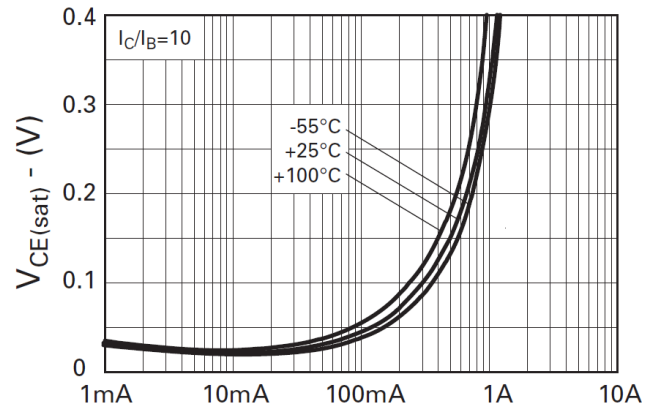
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	170	—	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	BV <sub>CEO</sub>	150	—	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	—	—	V	I <sub>E</sub> = 100μA
Collector Cut-Off Current	I <sub>CBO</sub>	—	—	100	nA	V <sub>CB</sub> = 150V
Emitter Cut-Off Current	I <sub>EBO</sub>	—	—	100	nA	V <sub>EB</sub> = 5.6V
Emitter Cut-Off Current	I <sub>CES</sub>	—	—	100	nA	V <sub>CE</sub> = 150V
DC Current Transfer Static Ratio (Note 7)	h <sub>FE</sub>	100	—	—	—	I <sub>C</sub> = 1mA, V <sub>CE</sub> = 10V
		100	—	300	—	I <sub>C</sub> = 250mA, V <sub>CE</sub> = 10V
		50	—	—	—	I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V
		10	—	—	—	I <sub>C</sub> = 1A, V <sub>CE</sub> = 10V
Collector-Emitter Saturation Voltage (Note 7)	V <sub>CE(sat)</sub>	—	—	0.2 0.3	V	I <sub>C</sub> = 250mA, I <sub>B</sub> = 25mA I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base-Emitter Saturation Voltage (Note 7)	V <sub>BE(sat)</sub>	—	—	1.0	V	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base-Emitter Turn-On Voltage (Note 7)	V <sub>BE(on)</sub>	—	—	1.0	V	I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V
Transitional Frequency	f <sub>T</sub>	100	—	-	MHz	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	—	10	pF	V <sub>CB</sub> = 10V, f = 1MHz,

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

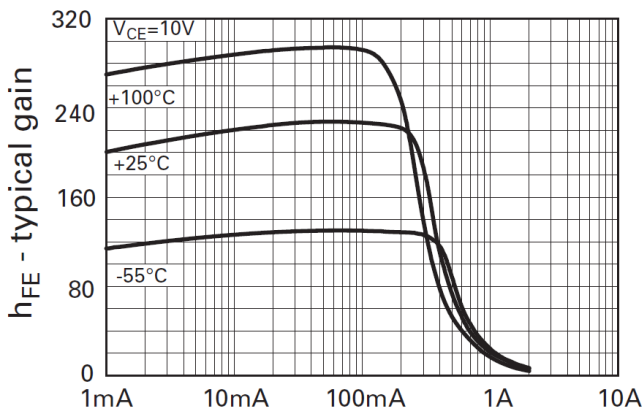
**Typical Electrical Characteristics**



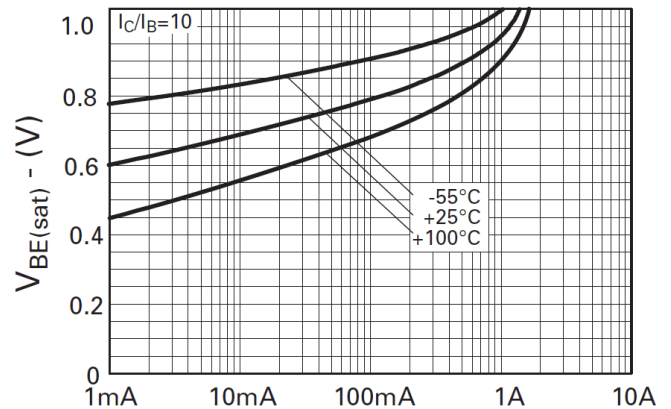
$I_C$  - Collector current  
 **$V_{CE(sat)}$  vs.  $I_C$**



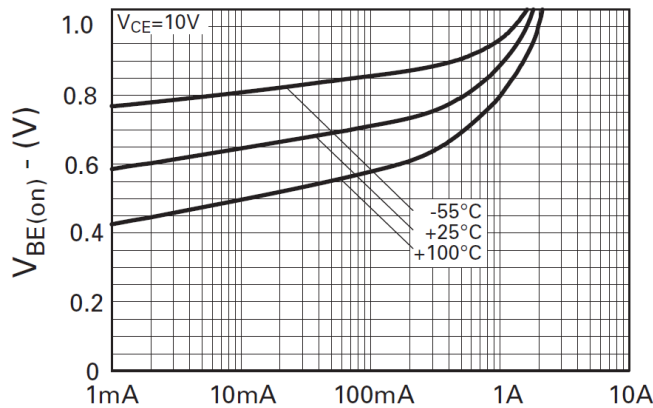
$I_C$  - Collector current  
 **$V_{CE(sat)}$  vs.  $I_C$**



$I_C$  - Collector current  
 **$h_{FE}$  vs.  $I_C$**



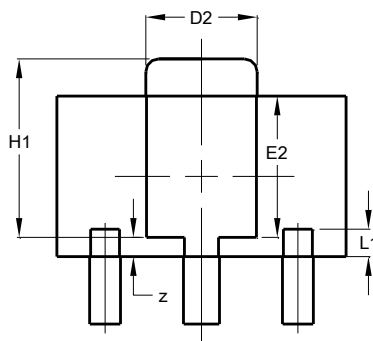
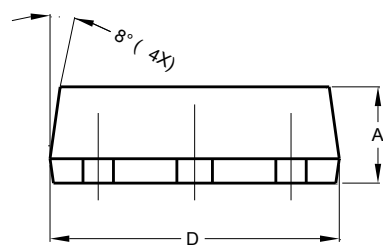
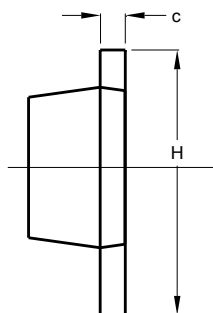
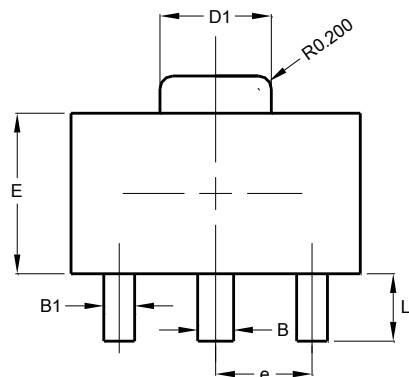
$I_C$  - Collector current  
 **$V_{BE(sat)}$  vs.  $I_C$**



$I_C$  - Collector current  
 **$V_{BE(on)}$  vs.  $I_C$**

## Package Outline Dimensions

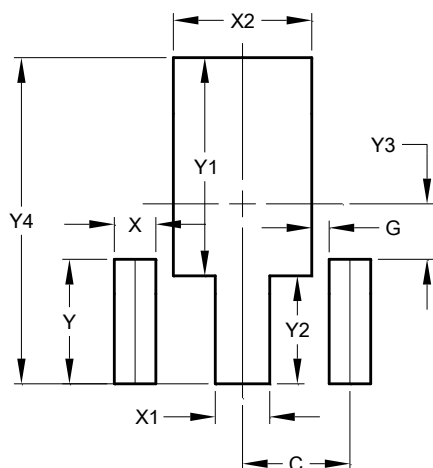
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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