





**100V NPN SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT89** 

### Features

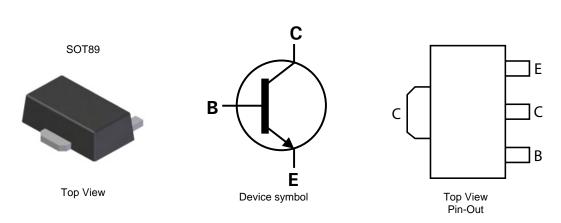
- BV<sub>CEO</sub> > 100V
- I<sub>C</sub> = 1A high Continuous Current
- Low saturation voltage V<sub>CE(sat)</sub> < 300mV @ 250mA</li>
- Complementary PNP type: FCX593
- Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

### Application

- Load management functions
- Solenoid, relay and actuator drivers
- DC DC modules

### **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, Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.052 grams (Approximate)



### Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX493TA	N93	7	12	1000
FCX493-13R	N93	13	12	4000

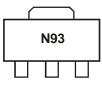
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.</li>

4. For packaging details, go to our website at http://www.diodes.com.

### **Marking Information**



N93 = Product Type Marking Code





### **Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

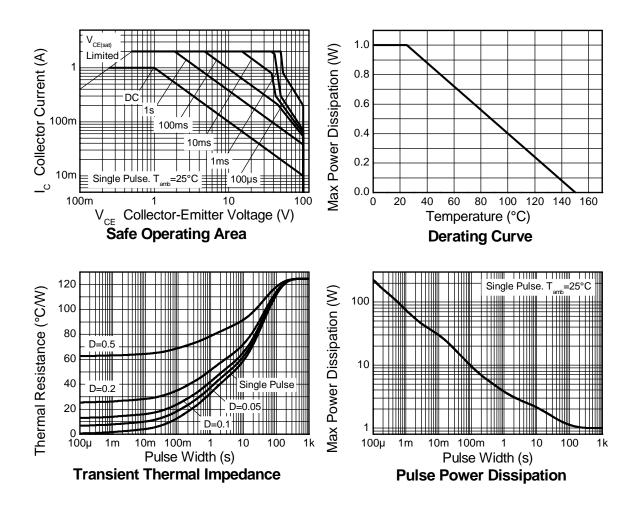
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	120	V
Collector-Emitter Voltage	V <sub>CEO</sub>	100	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	Ic	1	A
Peak Pulse Current	I <sub>CM</sub>	2	A
Continuous Base Current	IB	200	mA

# Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector Power Dissipation (Note 5)	PD	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	125	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R <sub>θJL</sub>	10.01	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> ,T <sub>STG</sub>	-65 to +150	°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





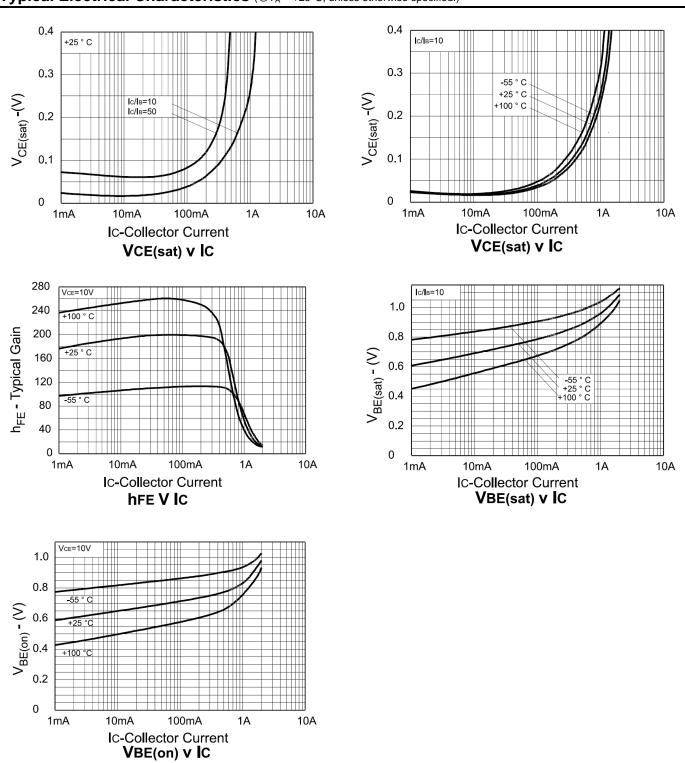


### Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.) **Test Condition** Characteristic Symbol Min Тур. Max Unit Collector-Base Breakdown Voltage $\mathsf{BV}_{\mathsf{CBO}}$ 120 V $I_C = 100 \mu A$ Collector-Emitter Breakdown Voltage (Note 7) 100 --V $I_C = 1mA$ $\mathsf{BV}_{\mathsf{CEO}}$ Emitter-Base Breakdown Voltage 7 V $I_E = 100 \mu A$ $BV_{EBO}$ --Collector Cutoff Current 100 $V_{CB} = 100V$ Ісво -nA Emitter Cutoff Current --100 nΑ $V_{EB} = 5V$ I<sub>EBO</sub> Emitter Cutoff Current 100 nΑ V<sub>CES</sub> = 100V ICES -- $I_C = 1mA, \ V_{CE} = 10V$ 100 -100 300 $I_{C} = 250 \text{mA}, V_{CE} = 10 \text{V}$ -DC current transfer Static ratio (Note 7) h<sub>FE</sub> -60 -- $I_{C} = 500 \text{mA}, V_{CE} = 10 \text{V}$ 20 -- $I_C = 1A, V_{CE} = 10V$ --0.3 $I_{C} = 500 \text{mA}, I_{B} = 50 \text{mA}$ Collector-Emitter Saturation Voltage (Note 7) V<sub>CE(sat)</sub> V \_ 0.6 - $I_{C} = 1A, I_{B} = 100mA$ --V Base-Emitter Saturation Voltage (Note 7) 1.15 $I_{C} = 1A, I_{B} = 100mA$ V<sub>BE(sat)</sub> Base-Emitter Turn-on Voltage (Note 7) V 1.0 $I_C = 1A$ , $V_{CE} = 10V$ V<sub>BE(on)</sub> -\_ $I_{C} = 50 \text{mA}, V_{CE} = 10 \text{V}$ Transitional Frequency 150 -MHz $\mathbf{f}_{\mathsf{T}}$ f = 100MHz10 pF Output capacitance $C_{\text{obo}}$ - $V_{CB} = 10V, f = 1MHz,$ -

7. Measured under pulsed conditions. Pulse width  $\leq$  300µs. Duty cycle  $\leq$  2%. Notes:







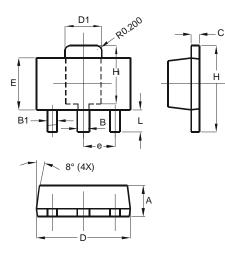
# Typical Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)





# **Package Outline Dimensions**

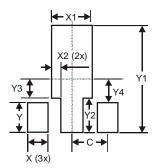
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT89		
Dim	Min	Max
Α	1.40	1.60
В	0.44	0.62
B1	0.35	0.54
С	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
Е	2.29	2.60
е	1.50 Typ	
Н	3.94	4.25
H1	2.63	2.93
L	0.89	1.20
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)
Х	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
С	1.500





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