

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

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirement of Automotive Applications.

**Features**

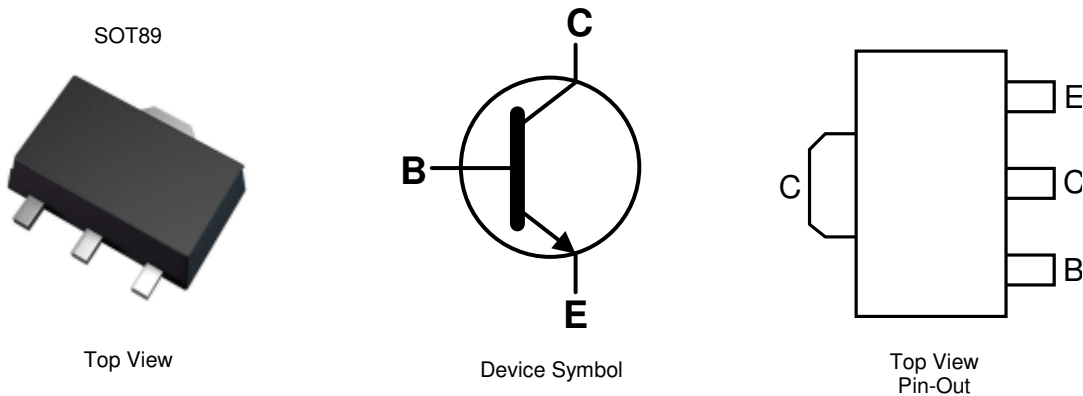
- $BV_{CEO} > 150V$
- $I_C = 1A$  High Continuous Current
- Low Saturation Voltage  $V_{CE(sat)} < 300mV @ 0.5A$
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

**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)

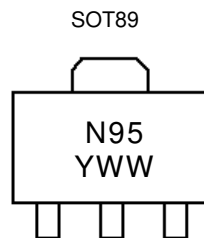
**Application**

- Low Loss Power Switching


**Ordering Information** (Notes 4 and 5)

Part Number	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
FCX495QTA	N95	7	12	1,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**


N95 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 8 = 2018)  
 WW = Week Code (01 to 53)

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

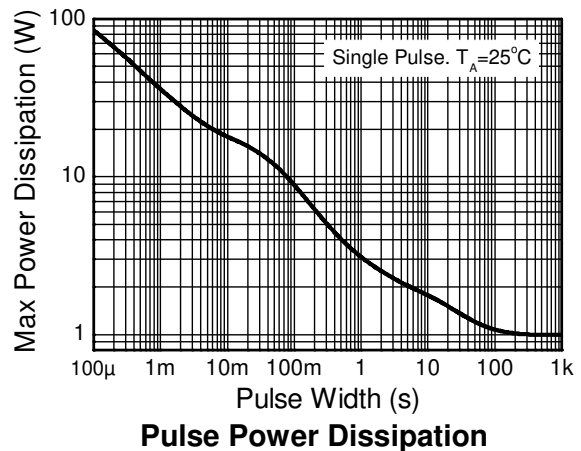
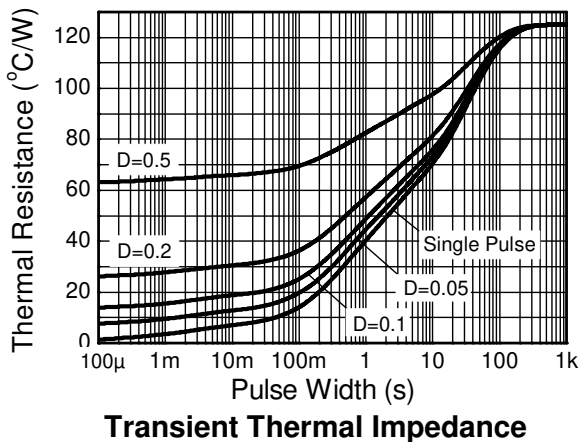
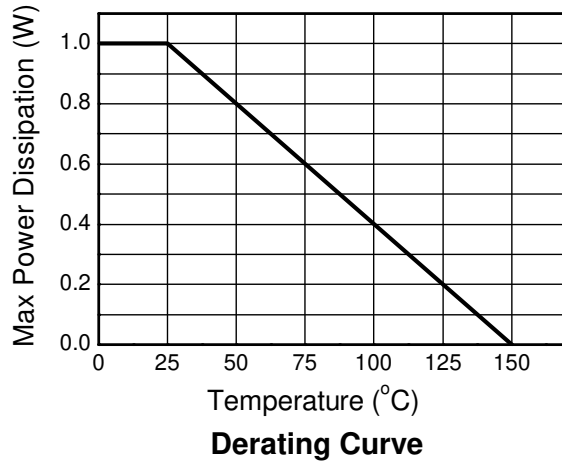
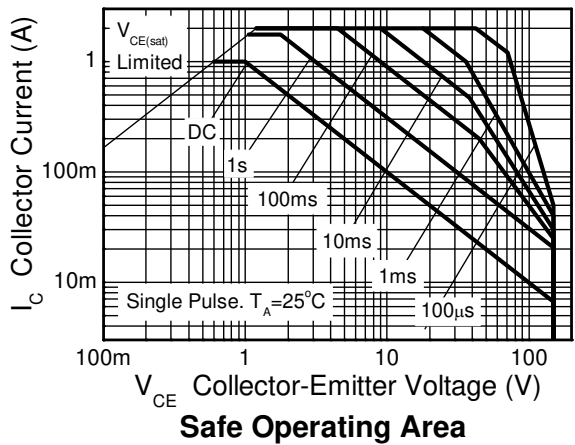
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	170	V
Collector-Emitter Voltage	V <sub>CEO</sub>	150	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	1	A
Peak Pulse Current	I <sub>CM</sub>	2	A
Continuous Base Current	I <sub>B</sub>	200	mA

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

Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P <sub>D</sub>	1	W
Thermal Resistance, Junction to Ambient Air (Note 6)	R <sub>θJA</sub>	125	°C/W
Thermal Resistance, Junction to Leads (Note 7)	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: 6. For the device mounted on 15mm x 15mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.  
 7. Thermal resistance from junction to solder-point (on the exposed collector pad).

### Thermal Characteristics and Derating Information

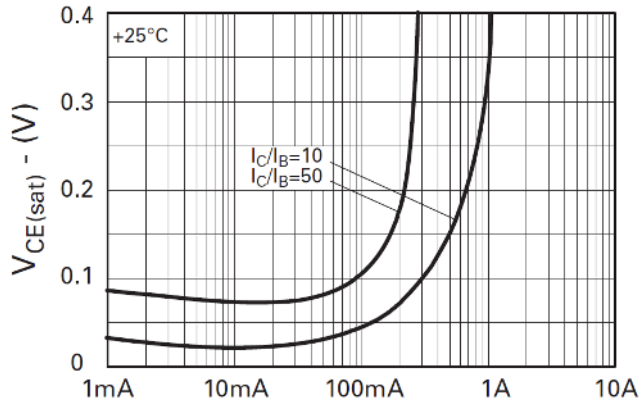


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

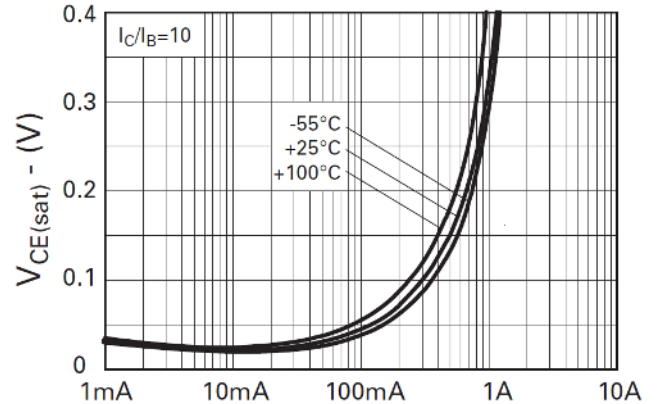
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	170	—	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV <sub>CEO</sub>	150	—	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	—	—	V	I <sub>E</sub> = 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 8)	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 8)	V <sub>CE(sat)</sub>	—	—	0.2	V	I <sub>C</sub> = 250mA, I <sub>B</sub> = 25mA
		—	—	0.3	—	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base-Emitter Saturation Voltage (Note 8)	V <sub>BE(sat)</sub>	—	—	1.0	V	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base-Emitter Turn-On Voltage (Note 8)	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: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

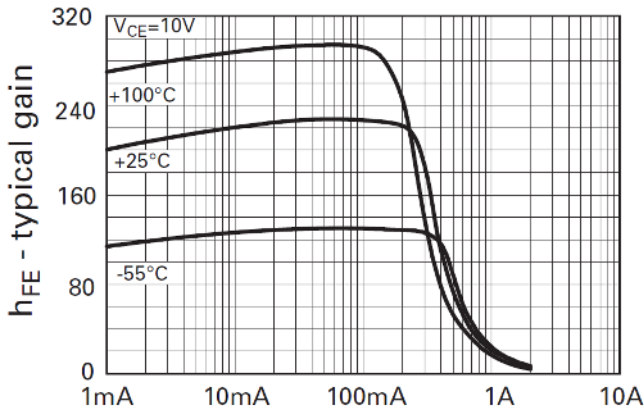
**Typical Electrical Characteristics**



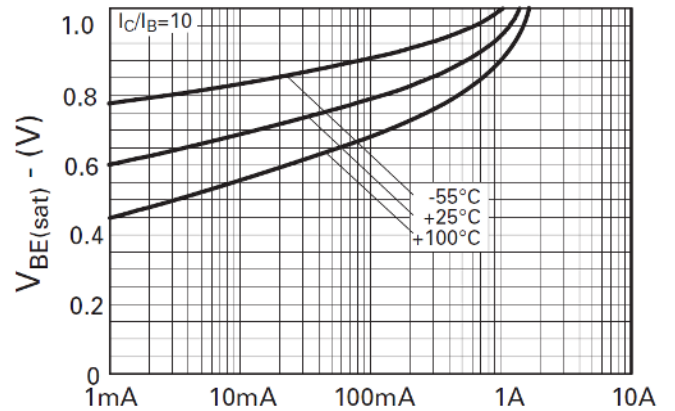
$I_C$  - Collector current  
 **$V_{CE(sat)}$  vs.  $I_C$**



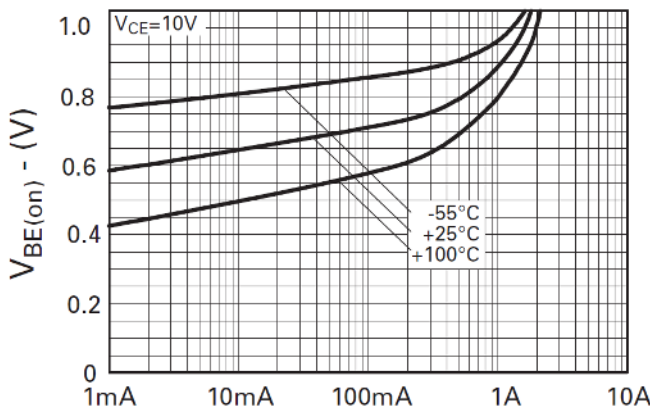
$I_C$  - Collector current  
 **$V_{CE(sat)}$  vs.  $I_C$**



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



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

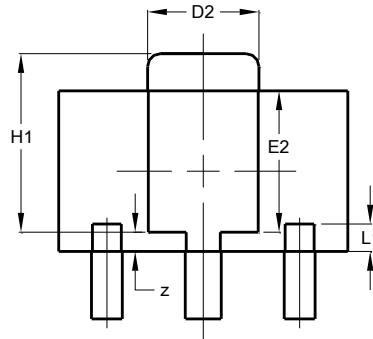
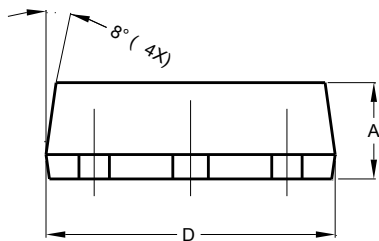
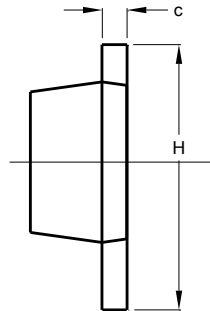
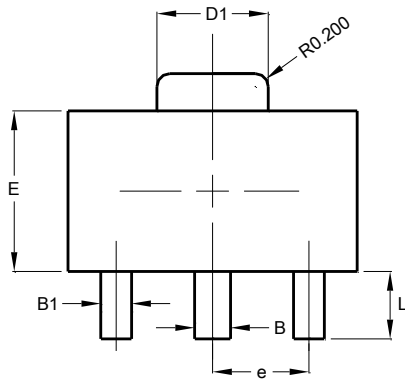


$I_C$  - Collector current  
 **$V_{BE(on)}$  vs.  $I_C$**

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT89**

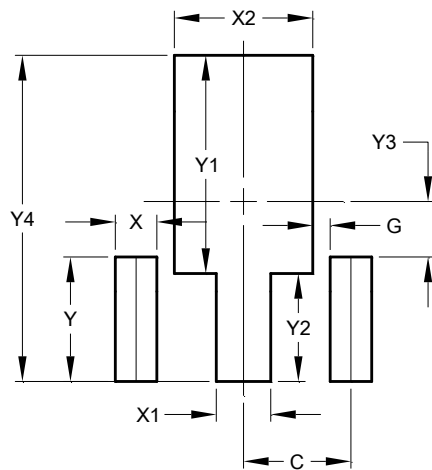


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT89**



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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