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

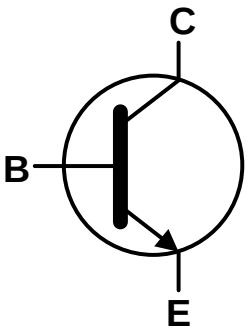
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.052 grams (Approximate)

Application

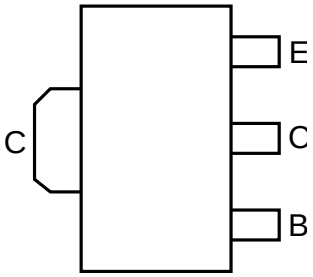
- Low Loss Power Switching

SOT89

Top View



Device Symbol



Top View
Pin-Out

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

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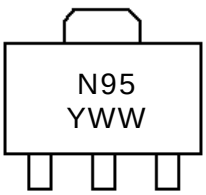


N95 = Product Type Marking Code
YWW = Date Code Marking
Y = Last Digit of Year (ex: 8 = 2018)
WW = Week Code (01 to 53)

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

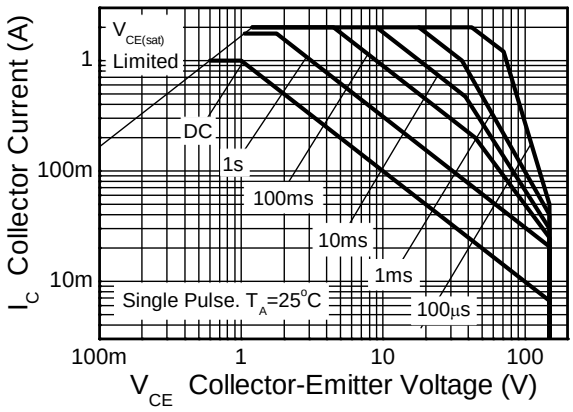
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	170	V
Collector-Emitter Voltage	V_{CEO}	150	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1	A
Peak Pulse Current	I_{CM}	2	A
Continuous Base Current	I_B	200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

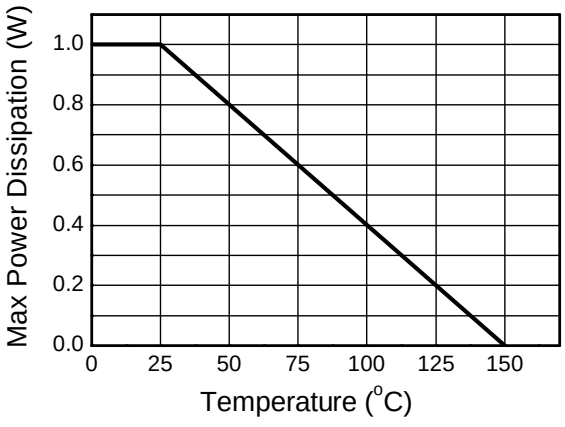
Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P_D	1	W
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Leads (Note 7)	$R_{\theta JL}$	10.01	°C/W
Operating and Storage Temperature Range	T_J,T_{STG}	-65 to +150	°C

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).

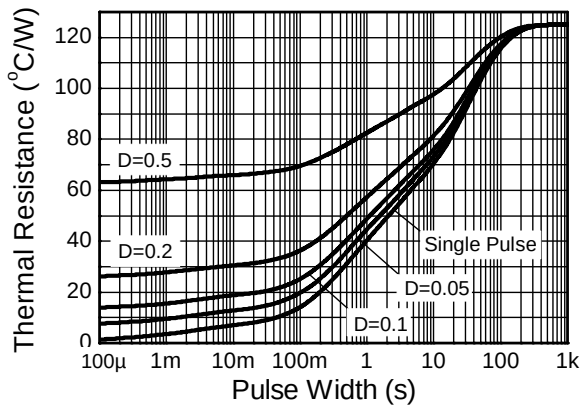
Thermal Characteristics and Derating Information



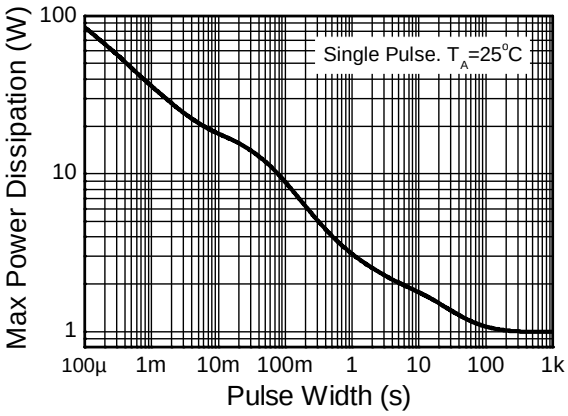
Safe Operating Area



Derating Curve



Transient Thermal Impedance



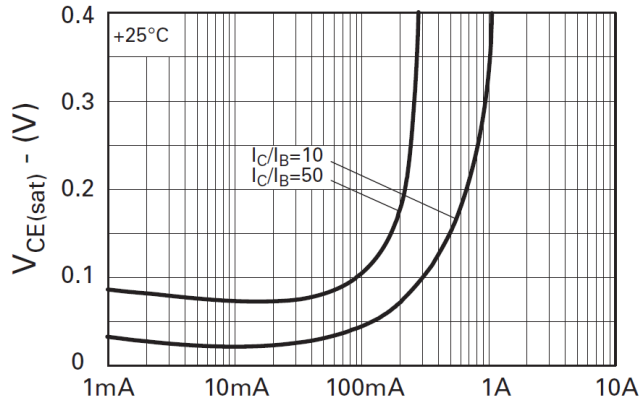
Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

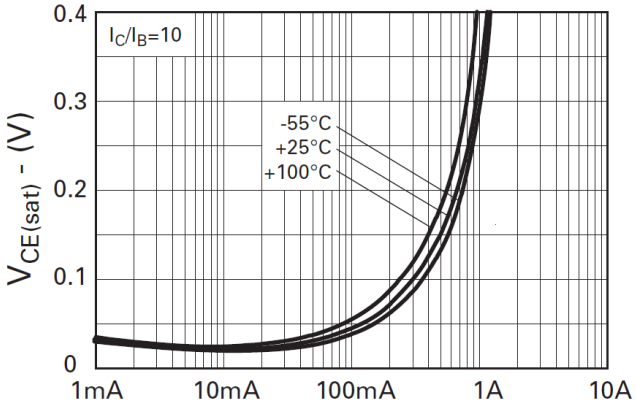
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	170	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	150	—	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100µA
Collector Cut-Off Current	I_{CBO}	—	—	100	nA	V_{CB} = 150V
Emitter Cut-Off Current	I_{EBO}	—	—	100	nA	V_{EB} = 5.6V
Emitter Cut-Off Current	I_{CES}	—	—	100	nA	V_{CE} = 150V
DC Current Transfer Static Ratio (Note 8)	h_{FE}	100 100 50 10	— — — —	— 300 — —	— — — —	I_C = 1mA, V_{CE} = 10V I_C = 250mA, V_{CE} = 10V I_C = 500mA, V_{CE} = 10V I_C = 1A, V_{CE} = 10V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	— —	— —	0.2 0.3	V	I_C = 250mA, I_B = 25mA I_C = 500mA, I_B = 50mA
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	—	—	1.0	V	I_C = 500mA, I_B = 50mA
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(on)}$	—	—	1.0	V	I_C = 500mA, V_{CE} = 10V
Transitional Frequency	f_T	100	—	—	MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
Output Capacitance	C_{obo}	—	—	10	pF	V_{CB} = 10V, f = 1MHz

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

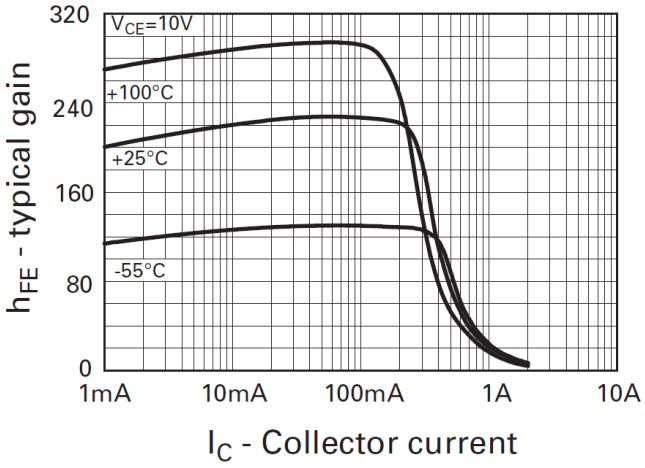
Typical Electrical Characteristics



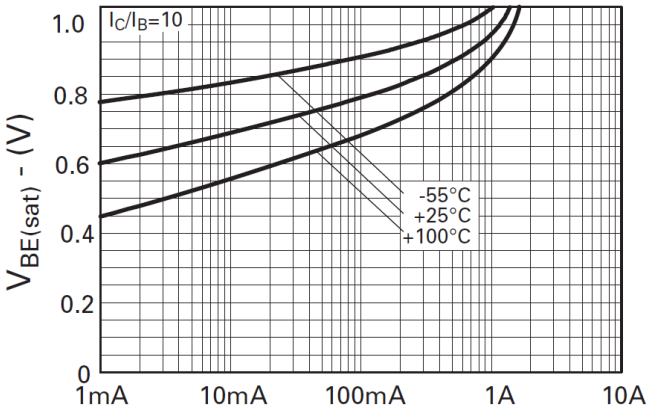
$V_{CE(sat)}$ vs. I_C



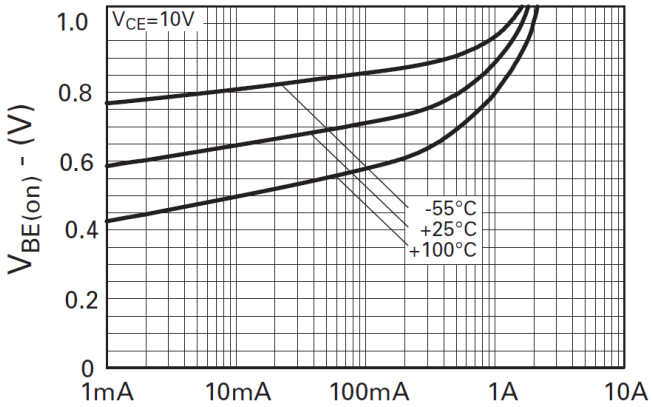
$V_{CE(sat)}$ vs. I_C



h_{FE} vs. I_C



$V_{BE(sat)}$ vs. I_C



$V_{BE(on)}$ vs. I_C

Package Outline Dimensions

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

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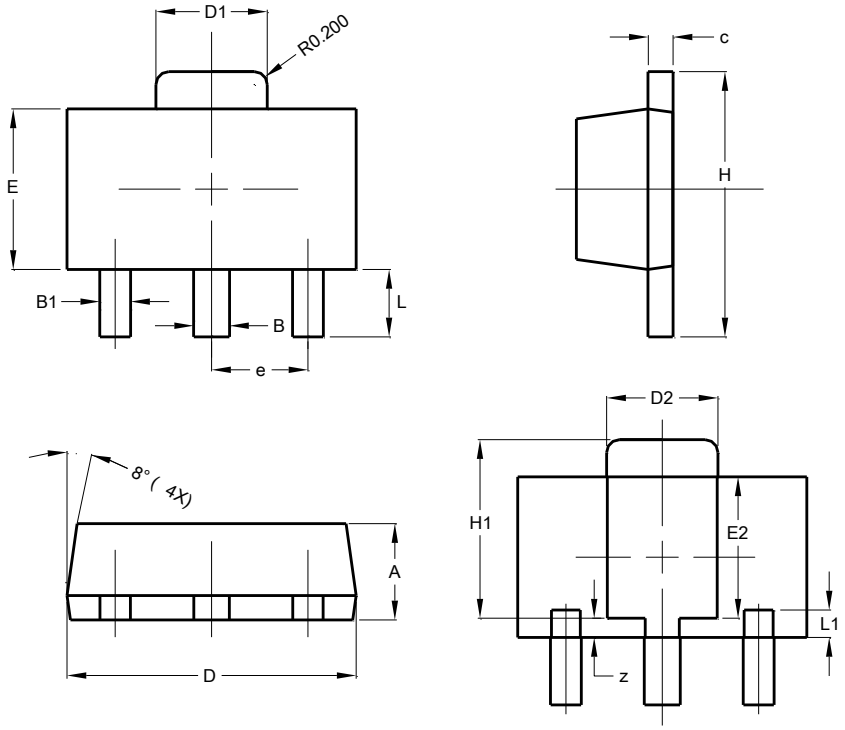

SOT89			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions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

Suggested Pad Layout

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

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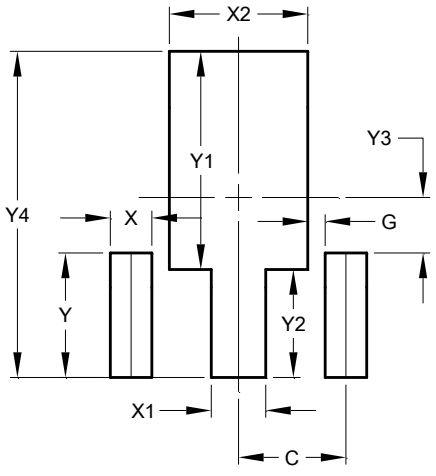

Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

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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