

**100V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89**

**Features**

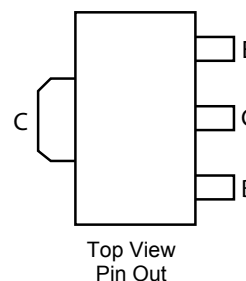
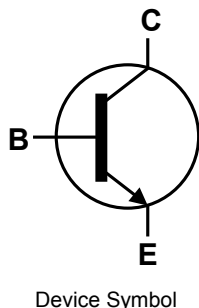
- $BV_{CE0} > 100V$
- $I_C = 4.5A$  high Continuous Current
- $I_{CM} = 10A$  Peak Pulse Current
- $R_{CE(sat)} = 31m\Omega$  for a low equivalent On-Resistance
- Low saturation voltage  $V_{CE(sat)} < 60mV @ I_C = 1A$
- $h_{FE}$  specified up to 10A for high current gain hold up
- **Lead-Free Finish; RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**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 @3
- Weight: 0.05 grams (Approximate)

**Applications**

- Motor driving
- Line switching
- High side switches
- Subscriber line interface cards (SLIC)

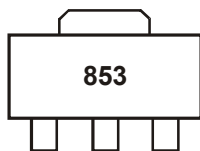


**Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN2011ZTA	853	7	12	1,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See <http://www.diodes.com> 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>.

**Marking Information**



853 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	200	V
Collector-Emitter Voltage	V <sub>CEO</sub>	100	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	4.5	A
Peak Pulse Current	I <sub>CM</sub>	10	A

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

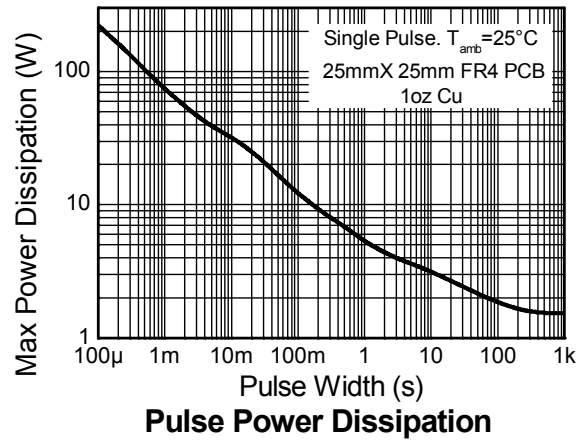
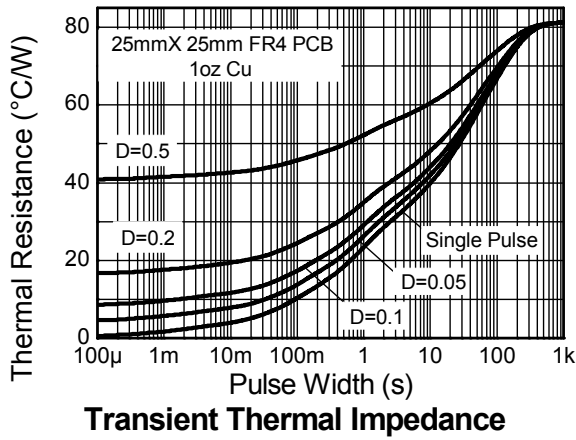
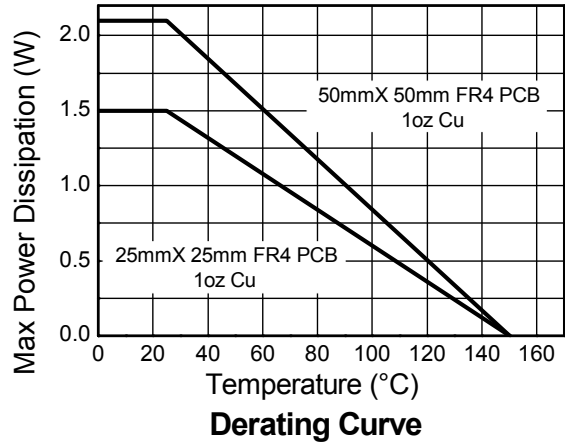
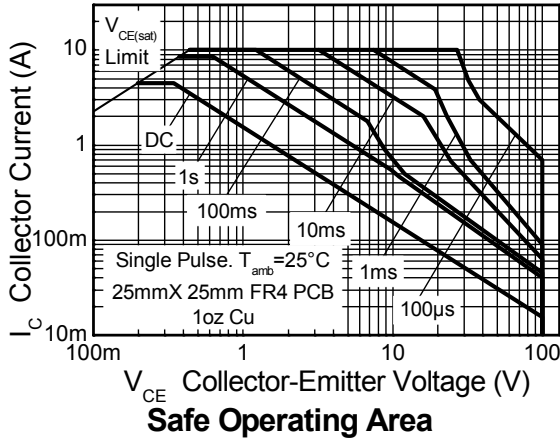
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	1.5	W
Linear derating factor		12	mW/°C
Power Dissipation (Note 6)	P <sub>D</sub>	2.1	W
Linear derating factor		16.8	mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	83	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	60	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	R <sub>θJL</sub>	3.23	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
  6. Same as note (5), except the device is mounted on 50mm X 50mm single sided 1oz weight copper.
  7. Thermal resistance from junction to solder-point (at the end of the collector lead).
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

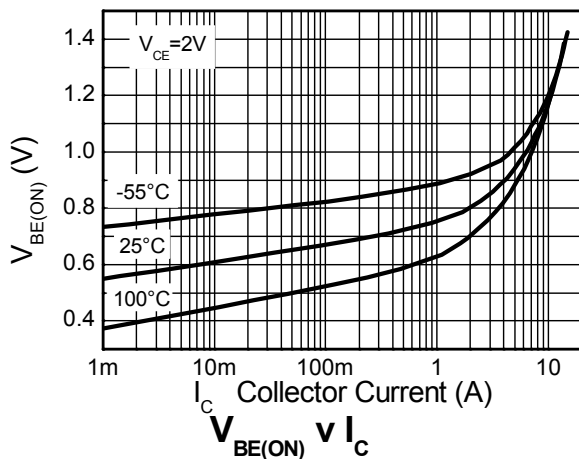
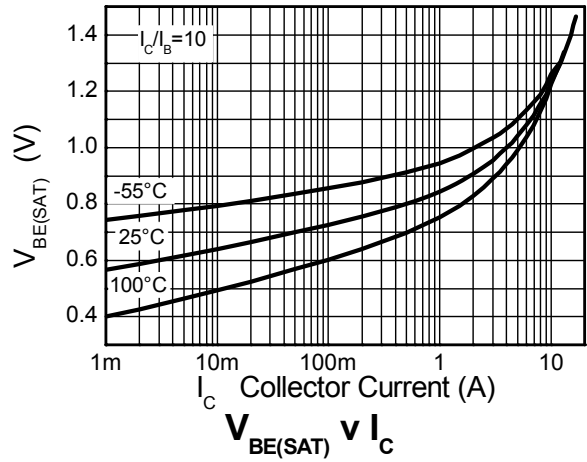
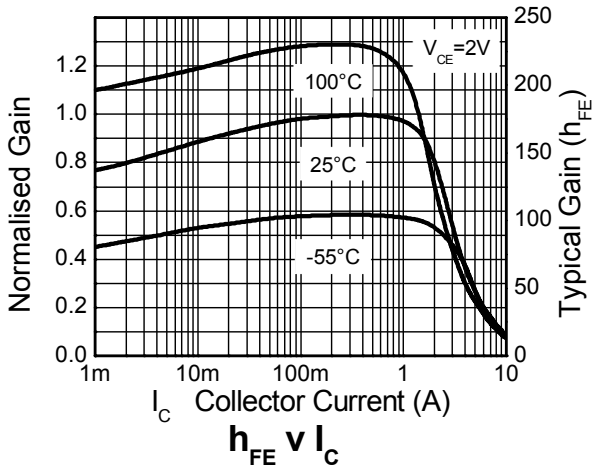
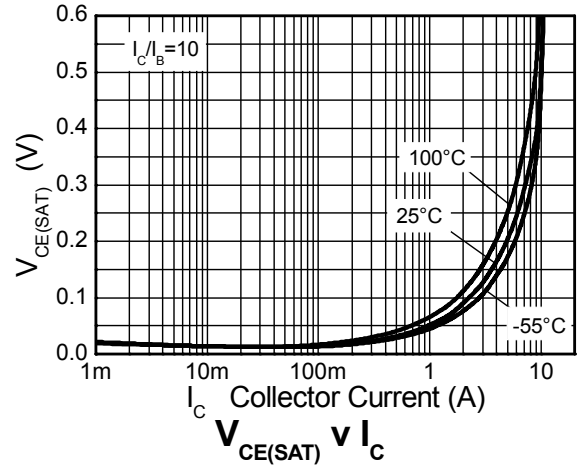
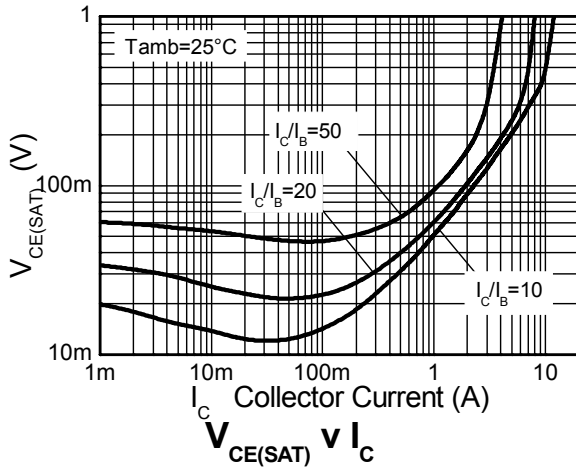


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	200	235	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Notes 9)	BV <sub>CER</sub>	200	235	-	V	I <sub>C</sub> = 1μA, R <sub>B</sub> ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Notes 9)	BV <sub>CEO</sub>	100	115	-	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.1	-	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CBO</sub>	-	<1	50	nA	V <sub>CB</sub> = 150V
		-	-	500	nA	V <sub>CB</sub> = 150V, T <sub>A</sub> = +100°C
Collector Cutoff Current	I <sub>CER</sub>	-	<1	100	nA	V <sub>CB</sub> = 150V
	R ≤ 1kΩ	-	-	500	nA	V <sub>CB</sub> = 150V, T <sub>A</sub> = +100°C
Emitter Cutoff Current	I <sub>EBO</sub>	-	<1	10	nA	V <sub>EB</sub> = 6V
DC Current Transfer Static Ratio (Notes 9)	h <sub>FE</sub>	100	230	-	-	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 2V
		100	200	300		I <sub>C</sub> = 2A, V <sub>CE</sub> = 2V
		30	60	-		I <sub>C</sub> = 5A, V <sub>CE</sub> = 2V
		10	20	-		I <sub>C</sub> = 10A, V <sub>CE</sub> = 2V
Collector-Emitter Saturation Voltage (Notes 9)	V <sub>CE(sat)</sub>	-	20	30	mV	I <sub>C</sub> = 100mA, I <sub>B</sub> = 5mA
		-	45	60		I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA
		-	85	115		I <sub>C</sub> = 2A, I <sub>B</sub> = 100mA
		-	155	195		I <sub>C</sub> = 5A, I <sub>B</sub> = 500mA
Base-Emitter Saturation Voltage (Notes 9)	V <sub>BE(sat)</sub>	-	1000	1100	mV	I <sub>C</sub> = 5A, I <sub>B</sub> = 500mA
Base-Emitter Turn-on Voltage (Notes 9)	V <sub>BE(on)</sub>	-	900	1000	mV	I <sub>C</sub> = 5A, V <sub>CE</sub> = 2V
Transitional Frequency	f <sub>T</sub>	-	130	-	MHz	I <sub>C</sub> = 100mA, V <sub>CE</sub> = 10V, f = 50MHz
Output Capacitance	C <sub>obo</sub>	-	26	-	pF	V <sub>CB</sub> = 10V, f = 1MHz,
Switching Time	t <sub>on</sub>	-	41	-	ns	V <sub>CC</sub> = 10V, I <sub>C</sub> = 1A, I <sub>B1</sub> = I <sub>B2</sub> = 100mA
	t <sub>off</sub>	-	1010	-		

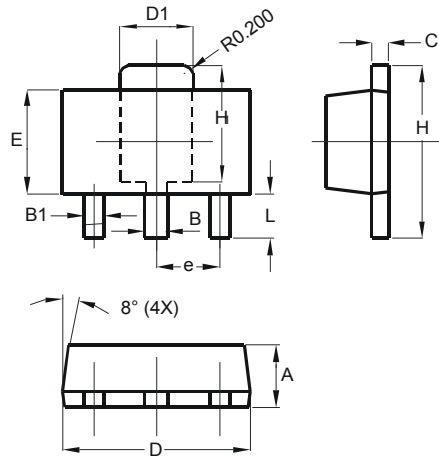
Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

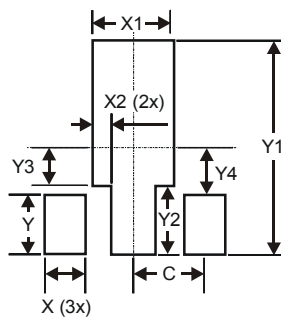
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 Typ	
H	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)
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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