

**ZXTN4002Z**

**100V NPN LED DRIVING TRANSISTOR IN SOT89**

**Features**

- $BV_{CEO} > 100V$
- Max continuous current  $I_C (cont) = 1A$
- $h_{FE} > 100 @ I_C = 150mA, V_{CE} = 200mV$
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

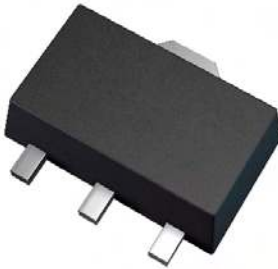
**Applications**

LED TV backlight

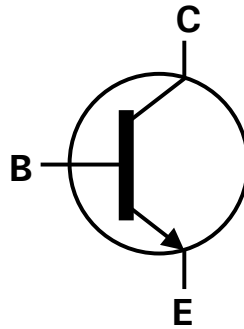
**Mechanical Data**

- Case: SOT89
- Case material: molded Plastic. "Green" molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (Approximate)

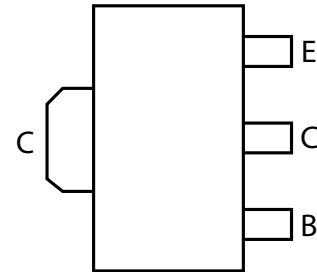
SOT89



Top View



Device symbol



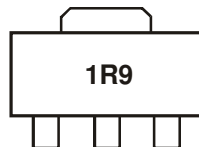
Top View  
Pin Out

**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN4002ZTA	1R9	7	12mm embossed	1000 units

- Notes:
1. No purposefully added lead.
  2. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>
  3. For Packaging Details, go to our website at <http://www.diodes.com>.

**Marking Information**



1R9 = Product type Marking Code

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

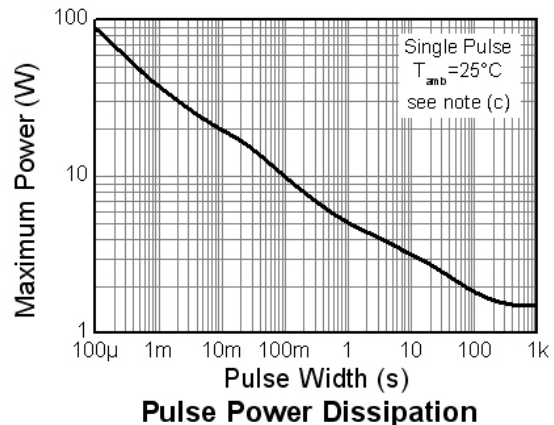
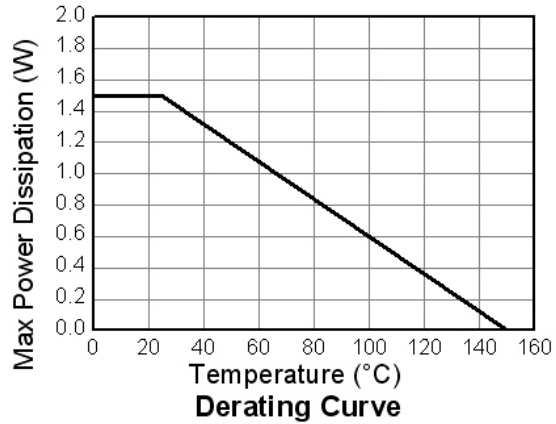
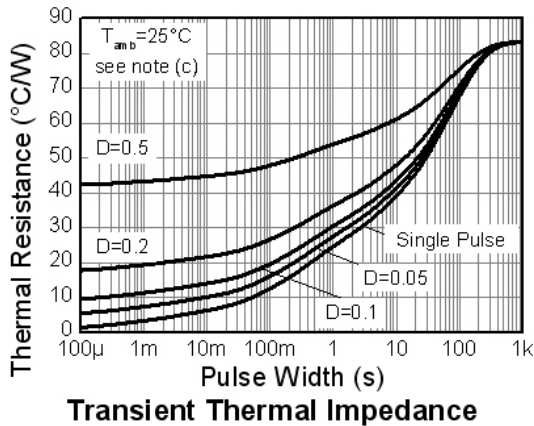
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	100	V
Collector-Emitter Voltage	$V_{CEO}$	100	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current	$I_C$	1	A
Peak Pulse Current (Note 4)	$I_{CM}$	3	A
Base Current	$I_B$	500	mA

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	83	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta JL}$	22.44	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
4. Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .
  5. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions
  6. Thermal resistance from junction to solder-point (at the end of the collector lead).

**Thermal Characteristics and Derating information**

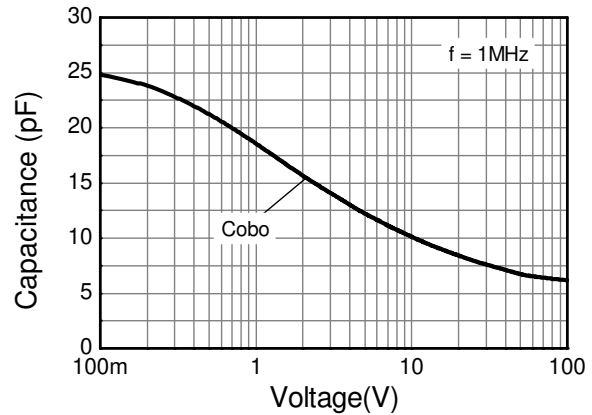
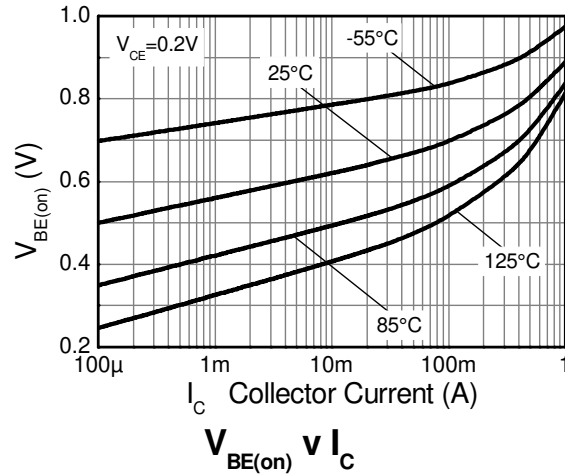
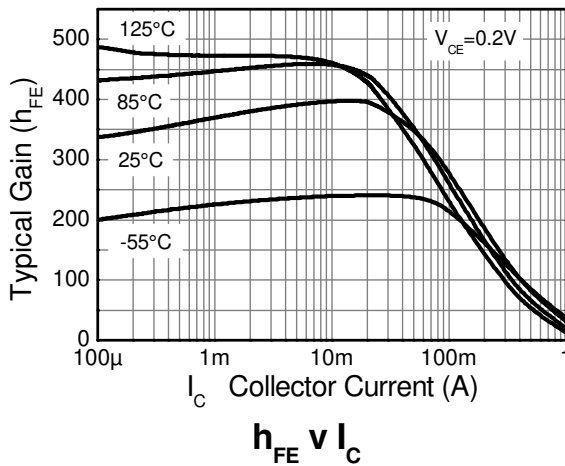


**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	100	-	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 7)	BV <sub>CEO</sub>	100	-	-	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	8.3	-	V	I <sub>E</sub> = 100μA
Collector Cut-off Current	I <sub>CBO</sub>	-	-	50	nA	V <sub>CB</sub> = 100V
Emitter Cut-off Current	I <sub>EBO</sub>	-	-	50	nA	V <sub>EB</sub> = 7V
Static Forward Current Transfer Ratio (Note 7)	h <sub>FE</sub>	60	-	-	-	I <sub>C</sub> = 85mA, V <sub>CE</sub> = 0.15V
		100	-	-	-	I <sub>C</sub> = 150mA, V <sub>CE</sub> = 0.2V
Base-Emitter Turn-On Voltage (Note 7)	V <sub>BE(on)</sub>	-	0.72	0.95	V	I <sub>C</sub> = 150mA, V <sub>CE</sub> = 0.2V
Delay Time	t <sub>(d)</sub>	-	468	-	ns	V <sub>CC</sub> = 80V, I <sub>C</sub> = 150mA, -I <sub>B2</sub> = 1.5mA, V <sub>CE(ON)</sub> = 0.2V
Rise Time	t <sub>(r)</sub>	-	441	-	ns	
Storage Time	t <sub>(s)</sub>	-	1540	-	ns	
Fall Time	t <sub>(f)</sub>	-	251	-	ns	V <sub>CC</sub> = 80V, I <sub>C</sub> = 150mA, -I <sub>B2</sub> = 1.5mA, V <sub>CE(ON)</sub> = 4V
Storage Time	t <sub>(s)</sub>	-	22	-	ns	
Fall Time	t <sub>(f)</sub>	-	204	-	ns	

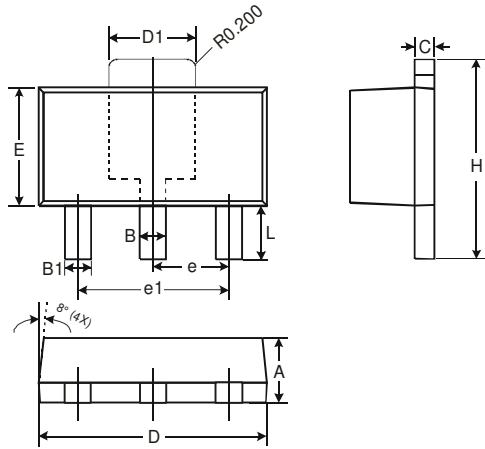
Notes: 7. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%

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



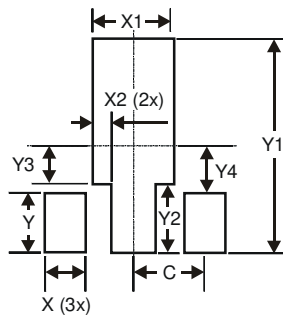
**Capacitance v Voltage**

**Package Outline Dimensions**



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
<b>All Dimensions in mm</b>		

**Suggested Pad Layout**



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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