

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**

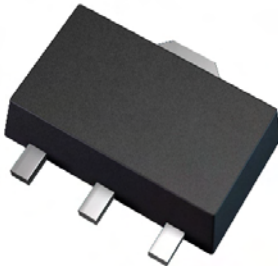
Applications

LED TV backlight

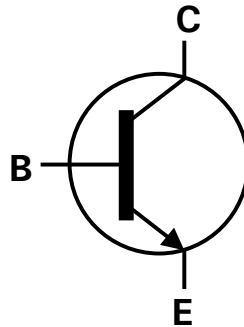
Mechanical Data

- 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)

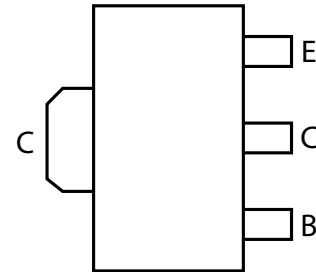
SOT89



Top View



Device symbol



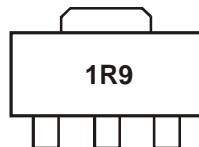
Top View
Pin Out

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°C unless otherwise specified

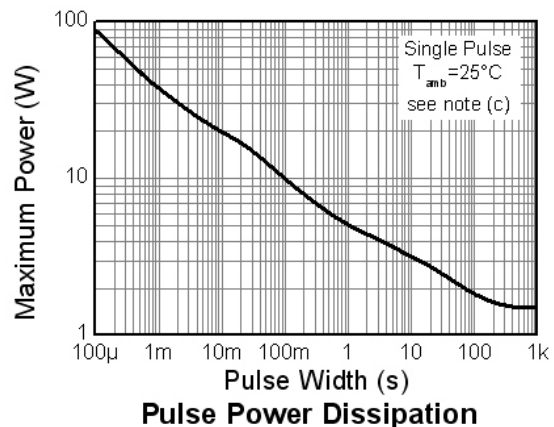
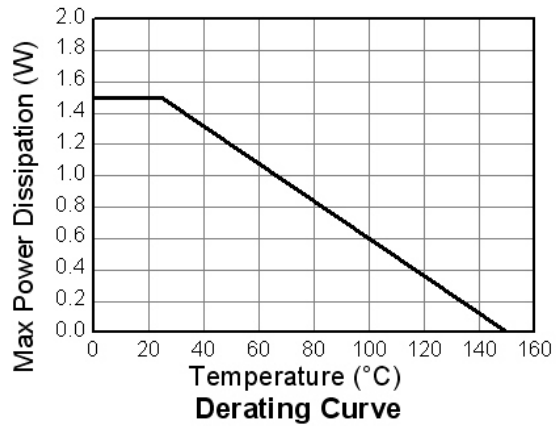
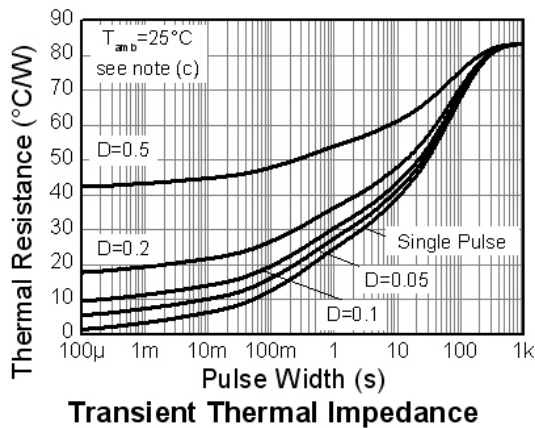
| Characteristic | Symbol | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CBO} | 100 | V |
| Collector-Emitter Voltage | V _{CEO} | 100 | V |
| Emitter-Base Voltage | V _{EBO} | 7 | V |
| Continuous Collector Current | I _C | 1 | A |
| Peak Pulse Current (Note 4) | I _{CM} | 3 | A |
| Base Current | I _B | 500 | mA |

Thermal Characteristics @T_A = 25°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 _{θJA} | 83 | °C/W |
| Thermal Resistance, Junction to Leads (Note 6) | R _{θJL} | 22.44 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

- Notes: 4. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 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

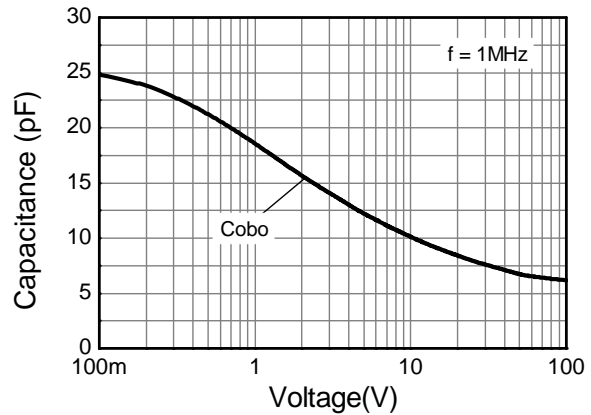
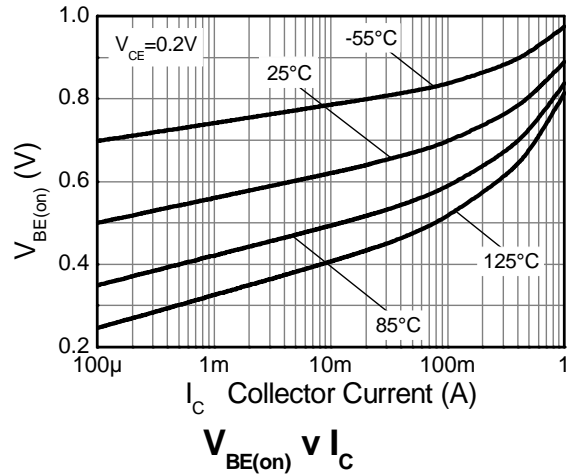
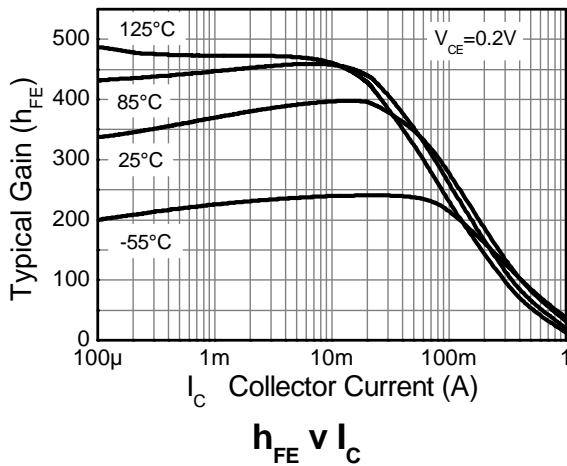


Electrical Characteristics @T_A = 25°C unless otherwise specified

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

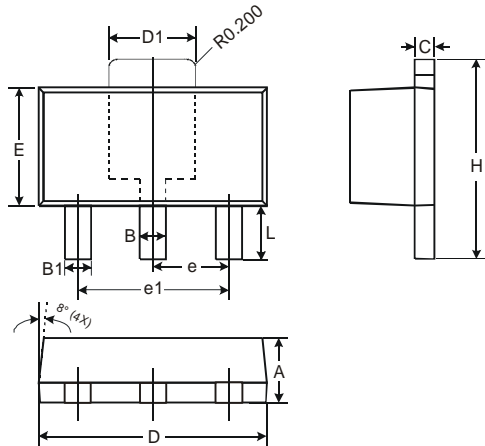
Notes: 7. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%

Electrical Characteristics @T_A = 25°C unless otherwise specified



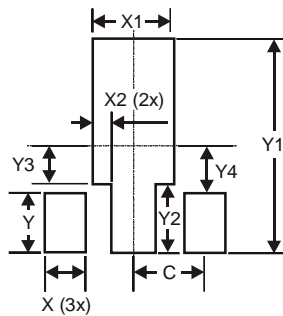
Capacitance v Voltage

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 |
| All Dimensions in mm | | |

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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