



**THE DATASHEET OF
ZVN4525ZTA**



Product Summary

| | | |
|---------------|------------------------------|------------------------------------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | I_D $T_A = +25^\circ\text{C}$ |
| 250V | 8.5Ω @ $V_{GS} = 10\text{V}$ | 240mA |

Description

This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

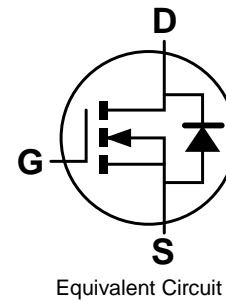
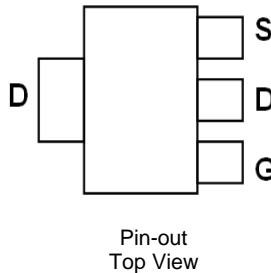
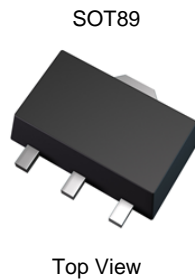
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc

Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Finish Annealed over Copper Lead frame. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.052 grams (Approximate)

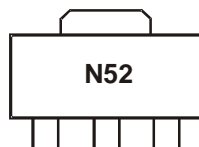


Ordering Information (Note 4)

| Part Number | Compliance | Case | Quantity per Reel |
|-------------|------------|-------|-------------------|
| ZVN4525ZTA | Standard | SOT89 | 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/quality/lead_free.html 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/products/packages.html>.

Marking Information



N52 = Marking Code

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

| Characteristic | | | Symbol | Value | Unit |
|---|--------------|---------------------------------|------------------|-------|------|
| Drain-Source Voltage | | | V _{DSS} | 250 | V |
| Gate-Source Voltage | | | V _{GSS} | ±40 | V |
| Continuous Drain Current, V _{GS} = 10V | Steady State | T _A = +25°C (Note 5) | I _D | 240 | mA |
| | | T _A = +70°C (Note 5) | | 192 | |
| Maximum Body Diode Forward Current | | | I _S | 1.1 | A |
| Pulsed Drain Current (Note 7) | | | I _{DM} | 1.44 | A |
| Pulsed Source Current (Note 7) | | | I _{SM} | 1.44 | A |

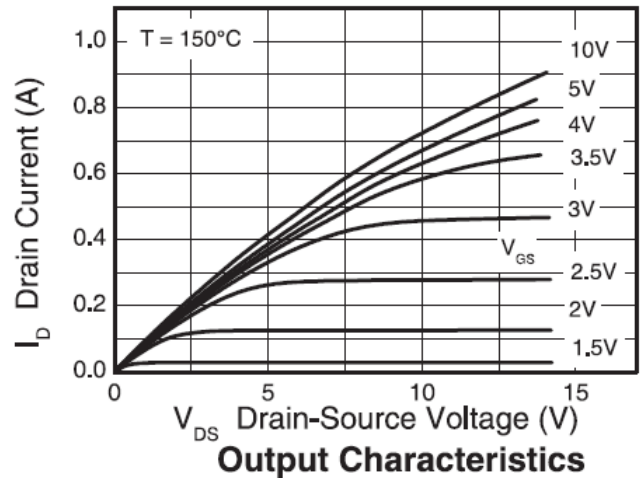
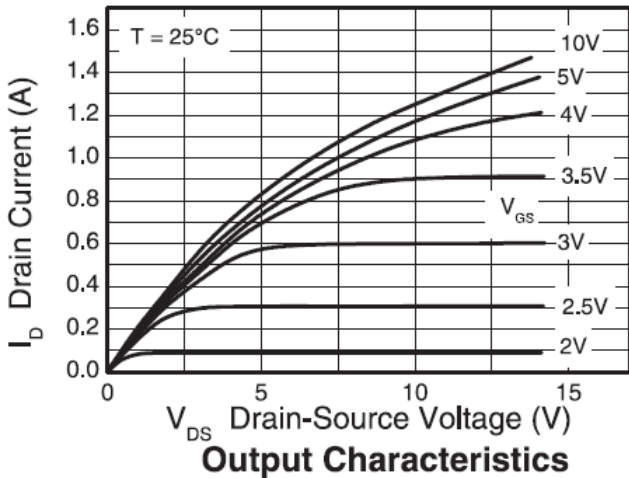
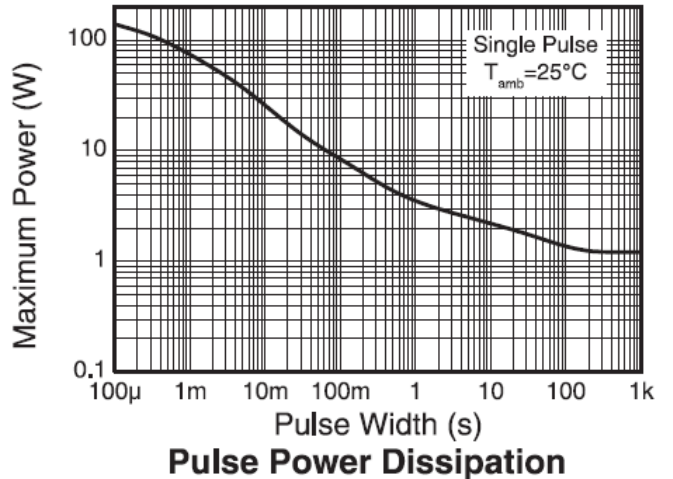
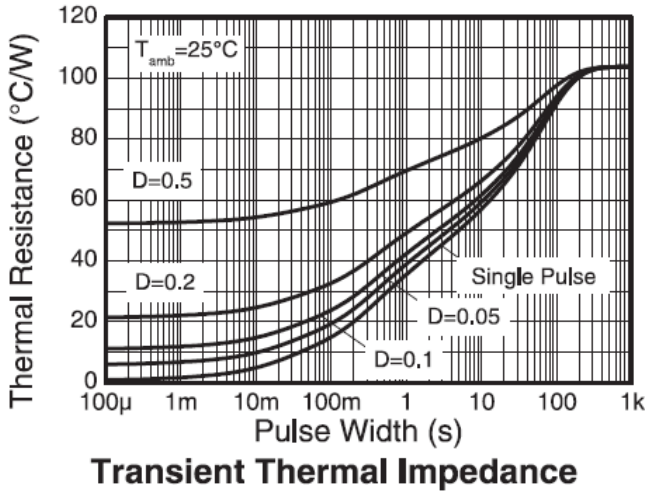
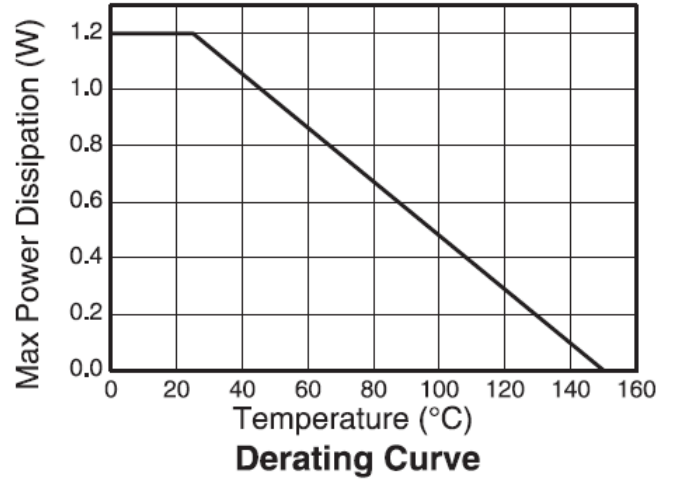
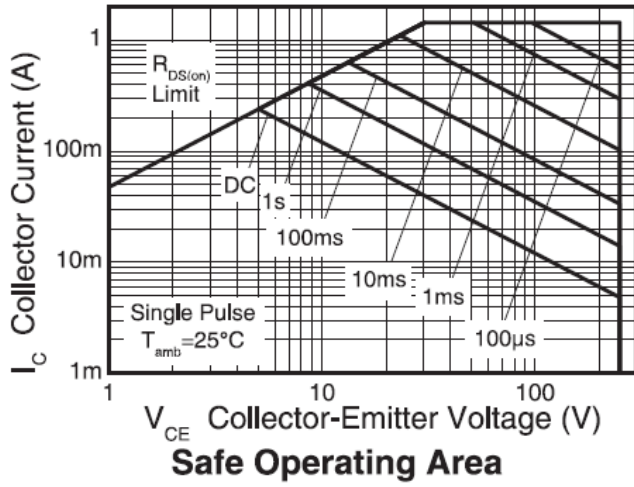
Thermal Characteristics

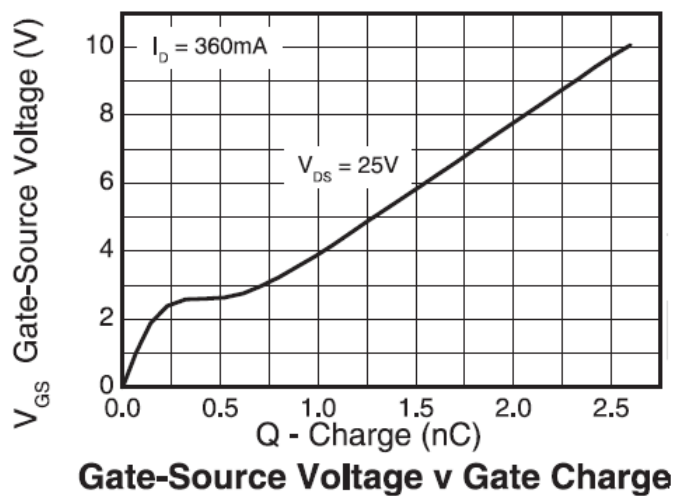
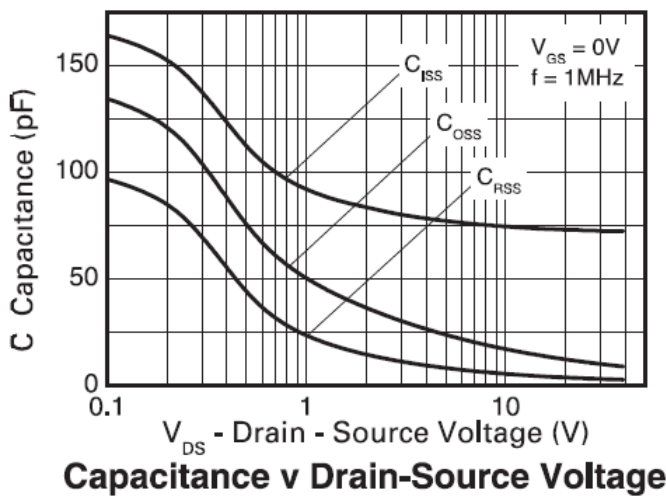
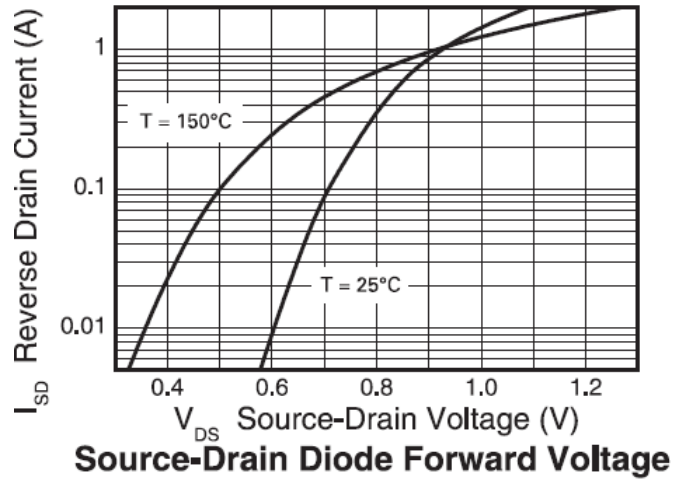
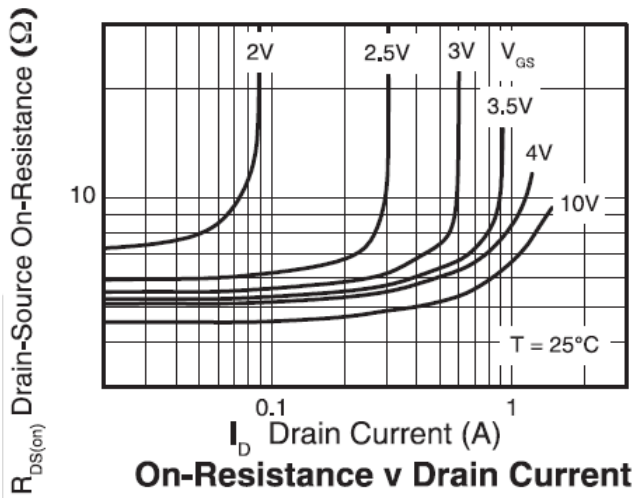
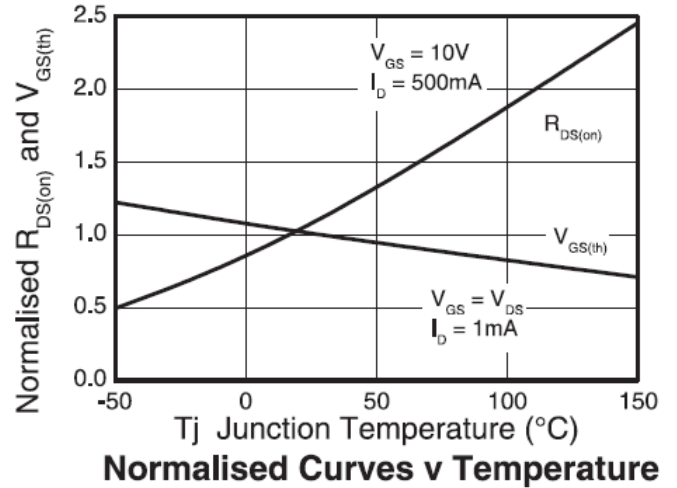
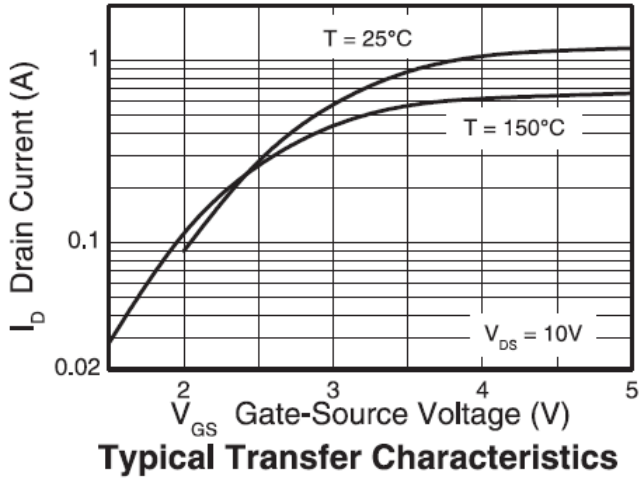
| Characteristic | | Symbol | Value | Unit |
|---|---------------------------------|-----------------------------------|-----------------------|-------|
| Total Power Dissipation | T _A = +25°C (Note 5) | P _D | 1.2 | W |
| Linear Derating Factor | | | 9.6 | mW/°C |
| Thermal Resistance, Junction to Ambient | Steady State (Note 5) | R _{θJA} | 103 | °C/W |
| | | | Steady State (Note 6) | 50 |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |

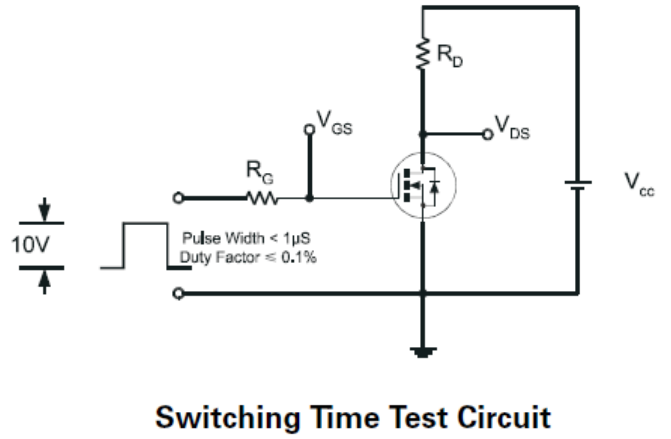
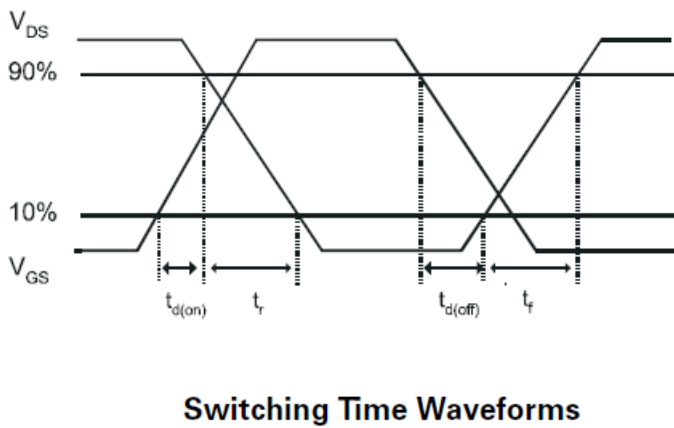
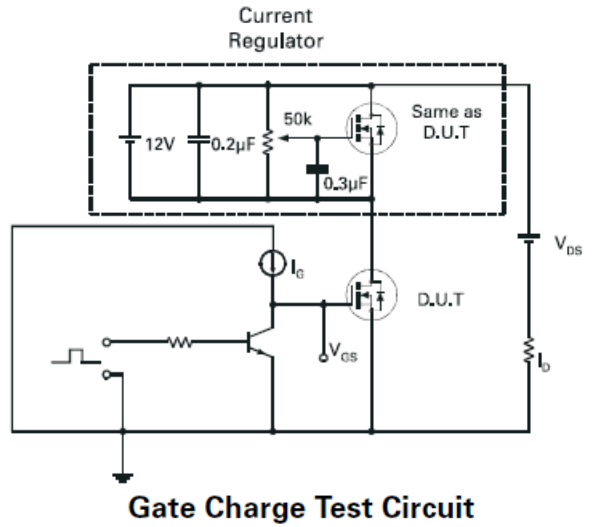
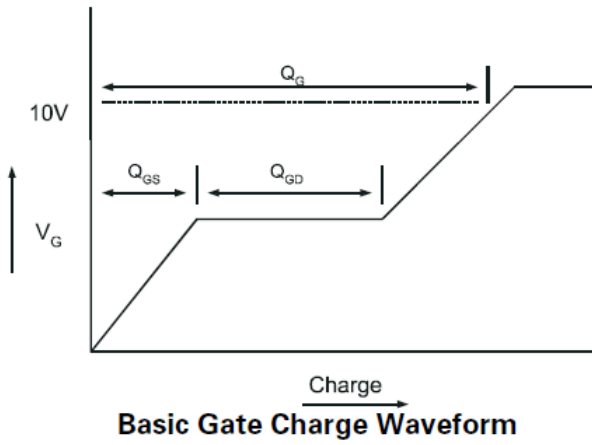
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|-------|------|------|--|
| OFF CHARACTERISTICS (Note 9) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 250 | 285 | — | V | V _{GS} = 0V, I _D = 1mA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | 35 | 500 | nA | V _{DS} = 250V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | ±1 | ±100 | nA | V _{GS} = ±40V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 9) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 0.8 | 1.4 | 1.8 | V | V _{DS} = V _{GS} , I _D = 1mA |
| Static Drain-Source On-Resistance (Note 8) | R _{DS(ON)} | — | 5.6 | 8.5 | Ω | V _{GS} = 10V, I _D = 500mA |
| | | — | 5.9 | 9.0 | | V _{GS} = 4.5V, I _D = 360mA |
| | | — | 6.4 | 9.5 | | V _{GS} = 2.4V, I _D = 20mA |
| | | — | — | — | | — |
| Diode Forward Voltage (Note 8) | V _{SD} | — | — | 0.97 | V | V _{GS} = 0V, I _S = 360mA |
| Forward Transconductance (Note 10) | g _{fs} | 0.3 | 475 | — | S | V _{DS} = 10V, I _D = 0.3A |
| DYNAMIC CHARACTERISTICS (Note 10) | | | | | | |
| Input Capacitance | C _{iss} | — | 72 | — | pF | V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 11 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 3.6 | — | | |
| Total Gate Charge | Q _g | — | 2.6 | 3.65 | nC | V _{DS} = 25V, I _D = 360mA, V _{GS} = 10V |
| Gate-Source Charge | Q _{gs} | — | 0.2 | 0.28 | | |
| Gate-Drain Charge | Q _{gd} | — | 0.5 | 0.70 | | |
| Turn-On Delay Time | t _{D(ON)} | — | 1.25 | — | ns | V _{DD} = 50V, R _G = 6.0Ω, I _D = 200mA, R _D = 4.4Ω |
| Turn-On Rise Time | t _R | — | 1.70 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 11.40 | — | | |
| Turn-Off Fall Time | t _F | — | 3.50 | — | | |
| Body Diode Reverse Recovery Time | t _{RR} | — | 186 | 260 | ns | I _F = 360mA, dI/dt = 100A/μs |
| Body Diode Reverse Recovery Charge | Q _{RR} | — | 34 | 48 | nC | |

- Notes:
5. For a device surface mounted on 25mm X 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air condition.
 6. For a device surface mounted on FR4 PCB measured at t ≤ 5 secs.
 7. Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal.
 8. Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%.
 9. Short duration pulse test used to minimize self-heating effect.
 10. Guaranteed by design. Not subject to product testing.

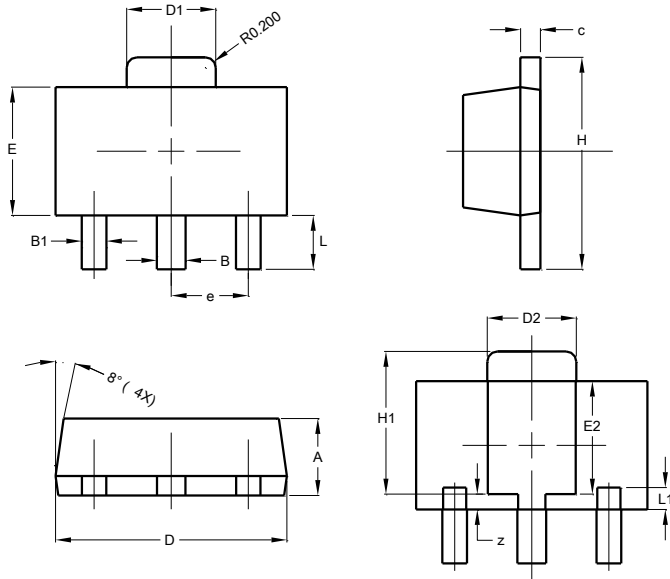






Package Outline Dimensions

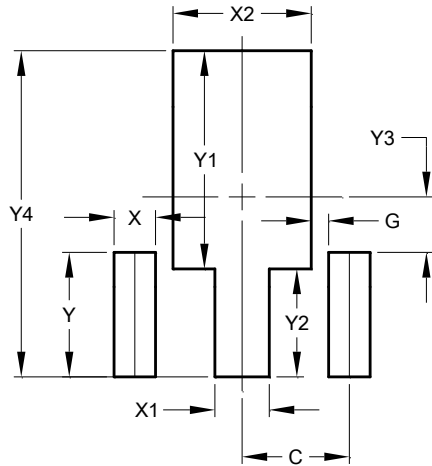
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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 | 0.427 REF | | |
| Z | 0.30 REF | | |
| 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) |
|------------|---------------|
| 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 |

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