



**THE DATASHEET OF
ZXMN10A08GTA**



Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ | I_D $T_A = 25^\circ C$ |
|---------------|--------------------------------|-----------------------------|
| 100V | 250m Ω @ $V_{GS} = 10V$ | 2.9A |
| | 300m Ω @ $V_{GS} = 6V$ | 2.6A |

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- **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: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (Ⓔ3)
- Weight: 0.112 grams (Approximate)

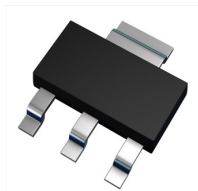
Description

This new generation trench MOSFET from Zetex features a unique structure, combining the benefits of low on-resistance and fast switching, making it ideal for high-efficiency, power management applications.

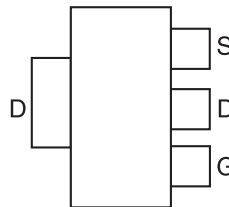
Applications

- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

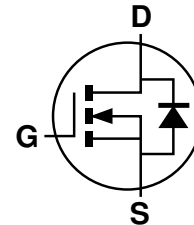
SOT223



Top View



Pin Out - Top



Equivalent Circuit

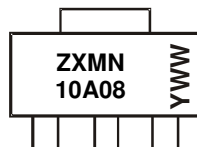
Ordering Information (Note 4)

| Part Number | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|--------------|-----------|--------------------|-----------------|-------------------|
| ZXMN10A08GTA | ZXMN10A08 | 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/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

SOT223



ZXMN10A08 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or $\bar{W}W$ = Week Code (01~53)

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

| Characteristic | Symbol | Value | Unit | |
|---|------------------|--|------|-----|
| Drain-Source Voltage | V _{DSS} | 100 | V | |
| Gate-Source Voltage | V _{GSS} | ±20 | V | |
| Continuous Drain Current (V _{GS} =10V; T _A = +25 °C) (Note 6) | I _D | 2.9 | A | |
| | | (V _{GS} =10V; T _A = +70 °C) (Note 6) | | 2.3 |
| | | (V _{GS} =10V; T _A = +25 °C) (Note 5) | | 2.0 |
| Pulsed Drain Current (Note 7) | I _{DM} | 11 | A | |
| Continuous Source Current (Body Diode) (Note 6) | I _S | 5 | A | |
| Pulsed Source Current (Body Diode) (Note 7) | I _{SM} | 11 | A | |

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

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|-------|
| Power Dissipation at T _A = +25 °C (Note 5) | P _D | 2.0 | W |
| Linear Derating Factor | | 16 | mW/°C |
| Power Dissipation at T _A = +25 °C (Note 6) | P _D | 3.9 | W |
| Linear Derating Factor | | 31 | mW/°C |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 62.5 | °C/W |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 32 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

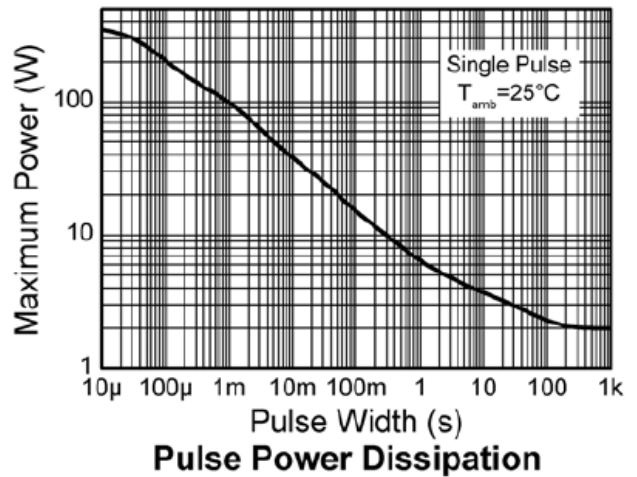
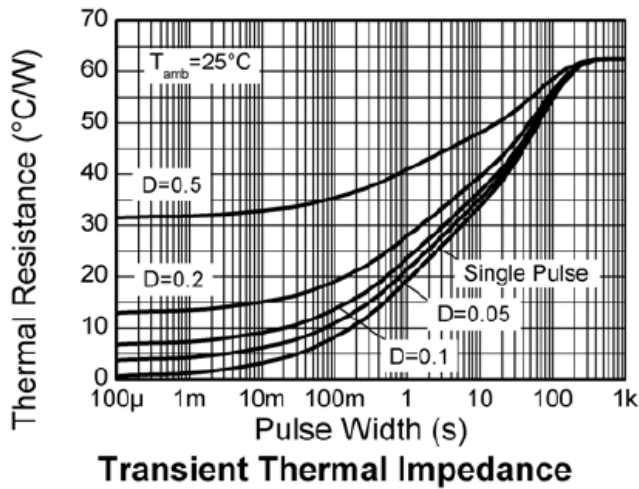
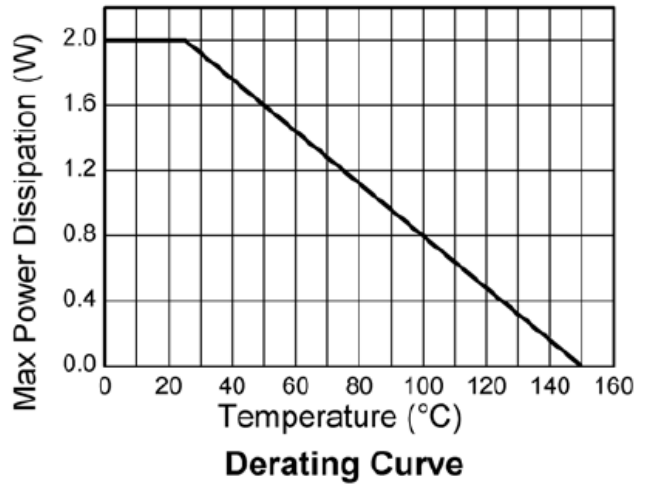
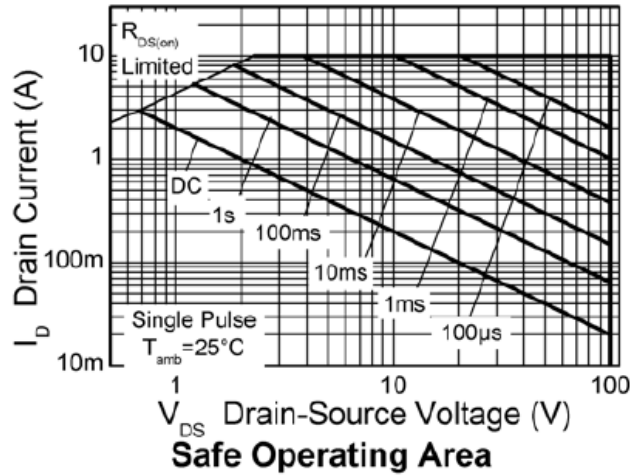
Electrical Characteristics (@T_A = +25 °C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|------|--------------|------|---|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 100 | - | - | V | V _{GS} = 0V, I _D = 250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | - | - | 0.5 | µA | V _{DS} = 100V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | - | - | 100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 2 | - | - | V | V _{DS} = V _{GS} , I _D = 250µA |
| Static Drain-Source On-Resistance (Note 8) | R _{DS(ON)} | - | - | 0.25 0.30 | Ω | V _{GS} = 10V, I _D = 3.2A V _{GS} = 6V, I _D = 2.6A |
| Forward Transconductance (Notes 8 & 10) | g _{fs} | - | 5 | - | S | V _{DS} = 15V, I _D = 3.2A |
| Diode Forward Voltage (Note 8) | V _{SD} | - | 0.87 | 0.95 | V | T _J = 25 °C, I _S = 3.2A, V _{GS} = 0V |
| DYNAMIC CHARACTERISTICS (Note 10) | | | | | | |
| Input Capacitance | C _{iss} | - | 405 | - | pF | V _{DS} = 50V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | - | 28.2 | - | pF | |
| Reverse Transfer Capacitance | C _{rss} | - | 14.2 | - | pF | |
| Turn-On Delay Time (Note 9) | t _{D(ON)} | - | 3.4 | - | ns | V _{DD} = 30V, I _D = 1.2A, V _{GS} = 10V, R _G = 6Ω |
| Turn-On Rise Time (Note 9) | t _R | - | 2.2 | - | ns | |
| Turn-Off Delay Time (Note 9) | t _{D(OFF)} | - | 8 | - | ns | |
| Turn-Off Fall Time (Note 9) | t _F | - | 3.2 | - | ns | |
| Gate Charge (Note 9) | Q _g | - | 4.2 | - | nC | V _{DS} = 50V, V _{GS} = 5V I _D = 1.2A |
| Total Gate Charge (Note 9) | Q _g | - | 7.7 | - | nC | V _{DS} = 50V, V _{GS} = 10V I _D = 1.2A |
| Gate-Source Charge (Note 9) | Q _{gs} | - | 1.8 | - | nC | |
| Gate-Drain Charge (Note 9) | Q _{gd} | - | 2.1 | - | nC | |
| Reverse Recovery Time | t _{rr} | - | 27 | - | ns | T _J = 25 °C, I _S = 1.2A, di/dt = 100A/µs |
| Reverse Recovery Charge | Q _{rr} | - | 32 | - | nC | |

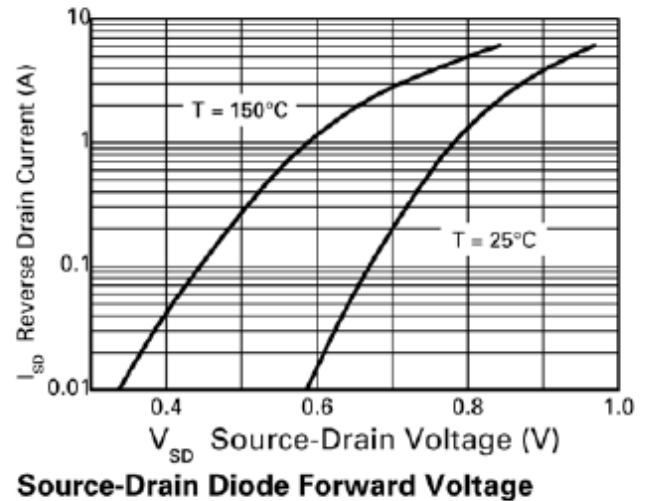
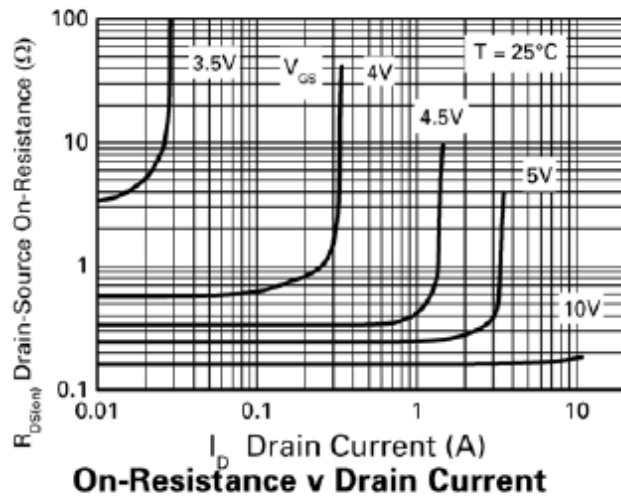
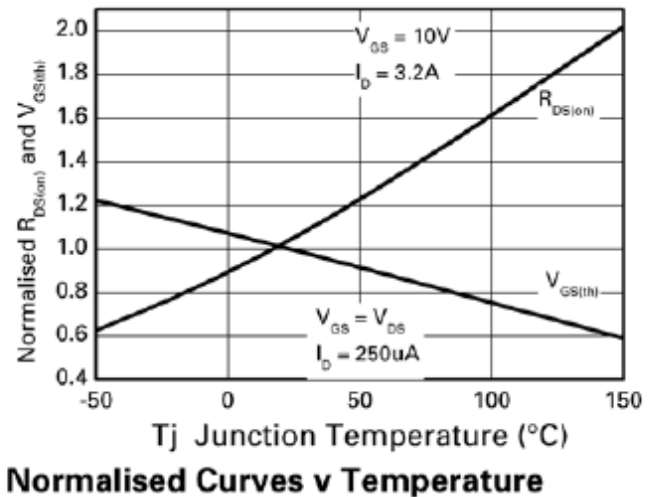
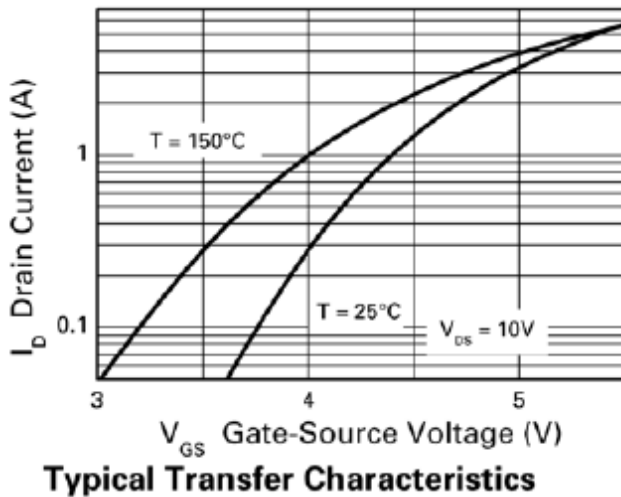
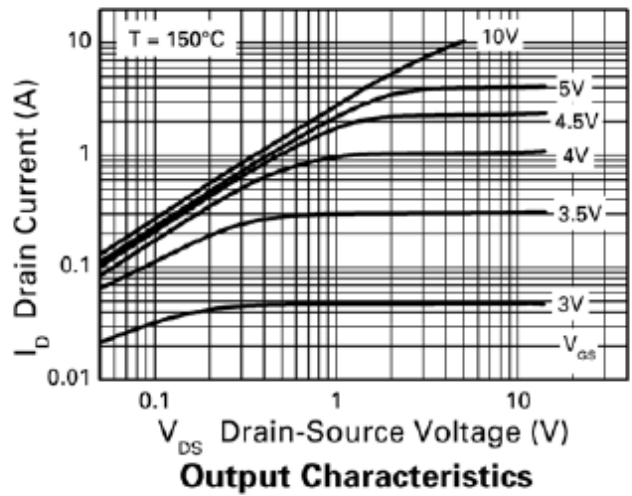
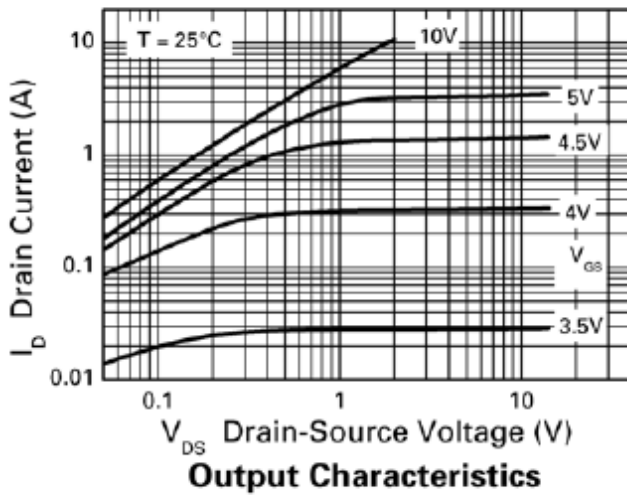
Notes:

- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- For a device surface mounted on FR4 PCB measured at t ≅ 10 secs.
- Repetitive rating - 25mm x 25mm FR4 PCB, D=0.02, pulse width 300µs - pulse width limited by maximum junction temperature.
- Measured under pulsed conditions. Pulse width ≅ 300µs. Duty cycle ≅ 2%.
- Switching characteristics are independent of operating junction temperature.
- For design aid only, not subject to production testing.

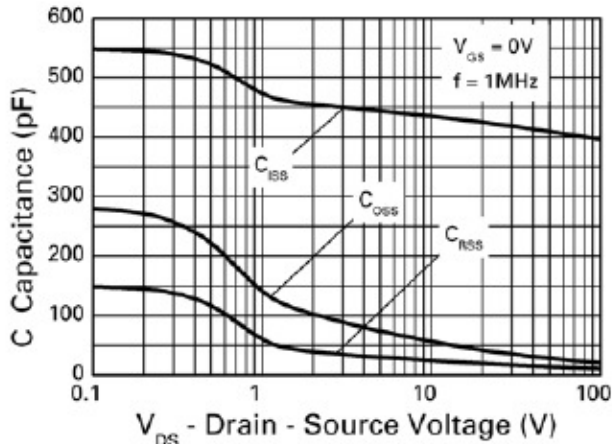
Thermal Characteristics



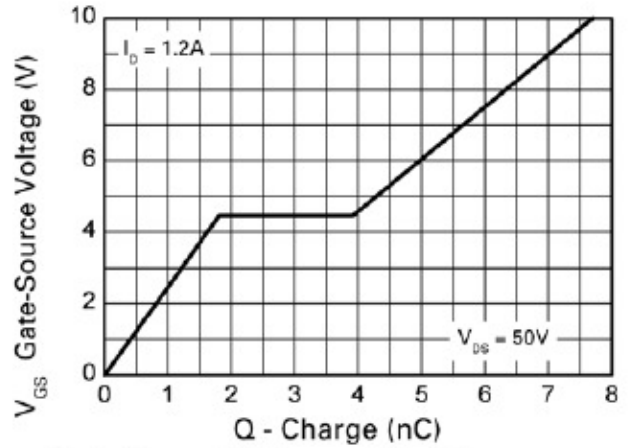
Typical Characteristics



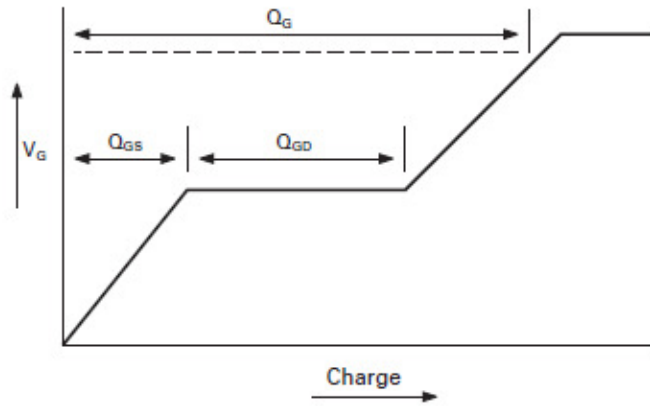
Typical Characteristics (continued)



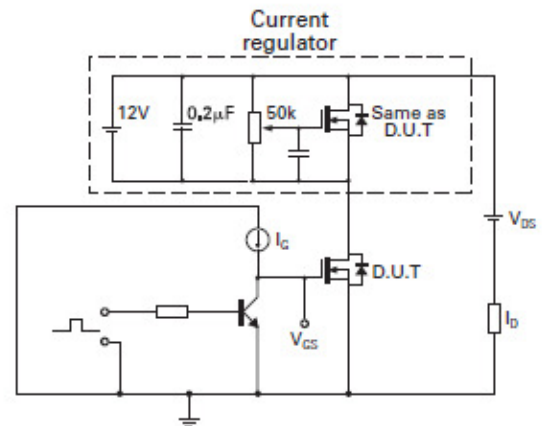
Capacitance v Drain-Source Voltage



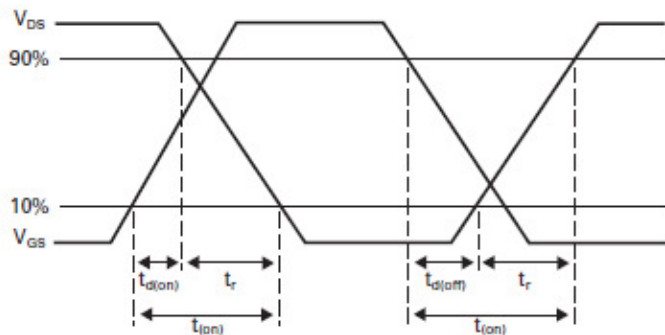
Gate-Source Voltage v Gate Charge



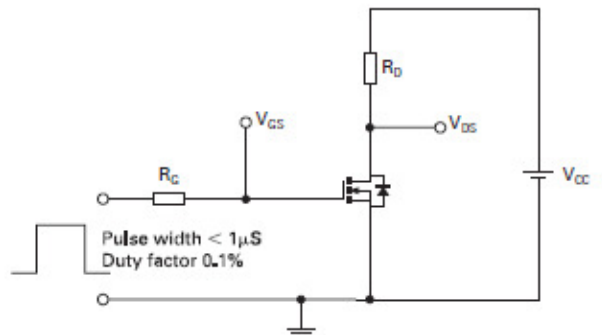
Basic gate charge waveform



Gate charge test circuit



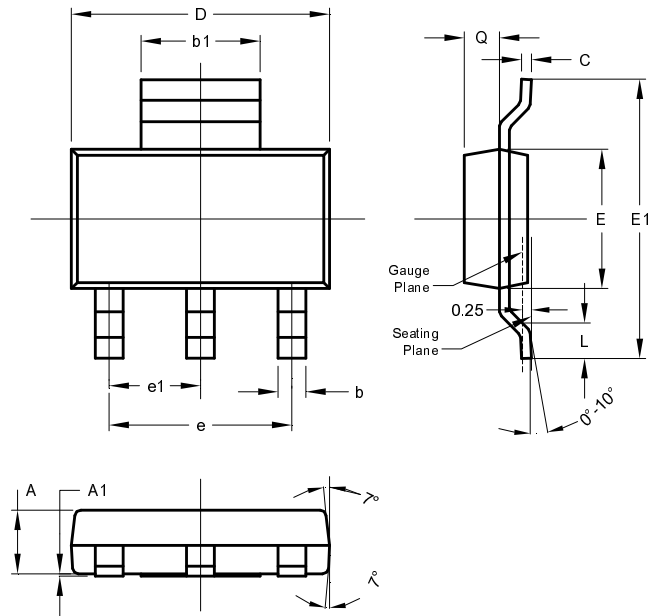
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

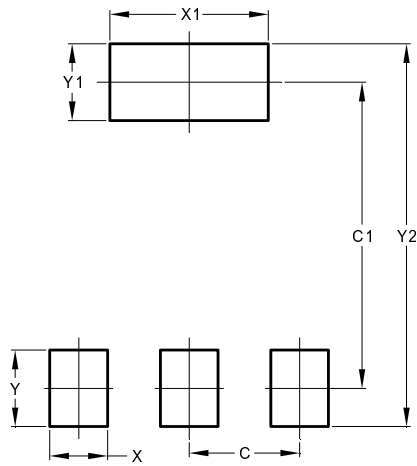
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT223 | | | |
|-----------------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b | 0.60 | 0.80 | 0.70 |
| b1 | 2.90 | 3.10 | 3.00 |
| C | 0.20 | 0.30 | 0.25 |
| D | 6.45 | 6.55 | 6.50 |
| E | 3.45 | 3.55 | 3.50 |
| E1 | 6.90 | 7.10 | 7.00 |
| e | - | - | 4.60 |
| e1 | - | - | 2.30 |
| L | 0.85 | 1.05 | 0.95 |
| Q | 0.84 | 0.94 | 0.89 |
| 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 | 2.30 |
| C1 | 6.40 |
| X | 1.20 |
| X1 | 3.30 |
| Y | 1.60 |
| Y1 | 1.60 |
| Y2 | 8.00 |

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