

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	$I_D$ $T_A = +25^\circ\text{C}$
100V	125m $\Omega$ @ $V_{GS} = 10\text{V}$	4.0A
	150m $\Omega$ @ $V_{GS} = 6.0\text{V}$	3.7A

## 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

- DC Motor Control
- DC-AC Inverters

## Features and Benefits

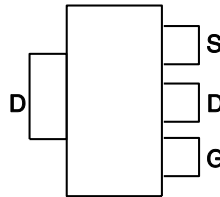
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

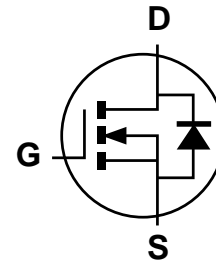
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208  $\text{\textcircled{E}}$
- Weight: 0.112 grams (Approximate)



Top View



Pin Out - Top View



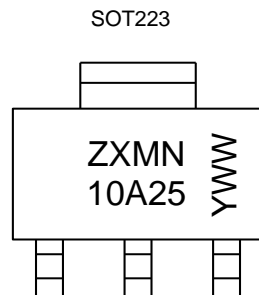
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
ZXMN10A25GTA	Standard	SOT223	1,000 / Tape & Reel

- Notes:
- EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  - See [http://www.diodes.com/quality/lead\\_free.html](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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



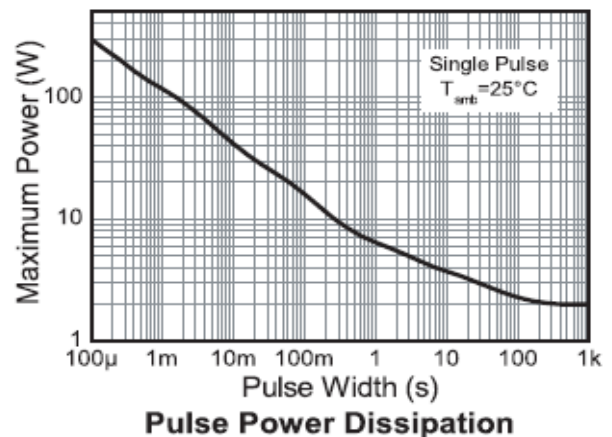
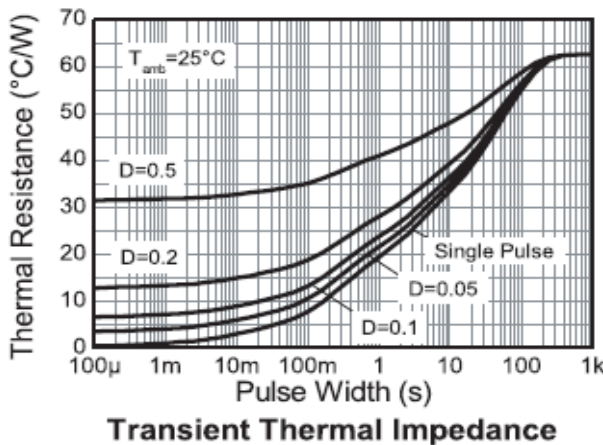
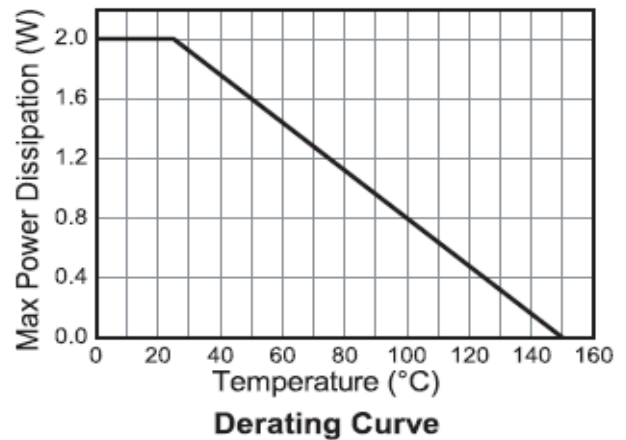
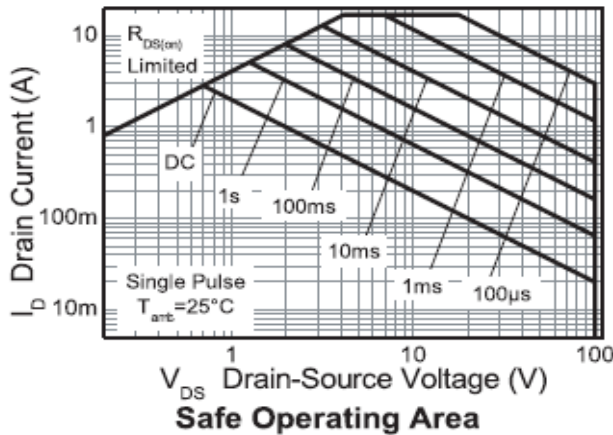
ZXMN 10A25 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 5= 2015)  
 WW or  $\bar{W}W$  = Week Code (01-53)

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

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	V <sub>DS</sub>	100	V	
Gate-Source Voltage	V <sub>GS</sub>	±20	V	
Continuous Drain Current, V <sub>GS</sub> = 10V, t ≤ 10 sec	I <sub>D</sub>	T <sub>A</sub> = +25°C	4.0	A
		T <sub>A</sub> = +70°C	3.2	A
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	I <sub>D</sub>	2.9	A	
Maximum Continuous Body Diode Forward Current (Note 5)	I <sub>S</sub>	5.4	A	
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I <sub>DM</sub>	17	A	
Pulsed Source Current (10µs pulse, duty cycle = 1%)	I <sub>SM</sub>	17	A	

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5), T <sub>A</sub> = +25°C	P <sub>D</sub>	2.0	W
Linear Derating Factor		16	mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	62.5	°C/W
Total Power Dissipation (Note 5), T <sub>A</sub> = +25°C, t ≤ 10 seconds	P <sub>D</sub>	3.9	W
Linear Derating Factor		31	mW/°C
Thermal Resistance, Junction to Ambient, t ≤ 10 seconds (Note 5)	R <sub>θJA</sub>	32	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

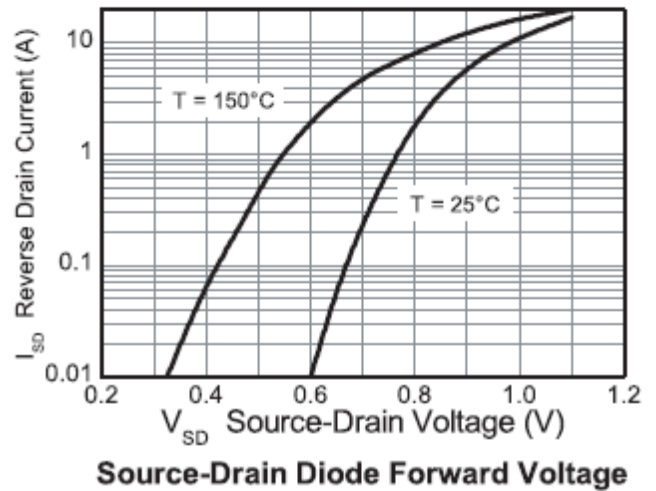
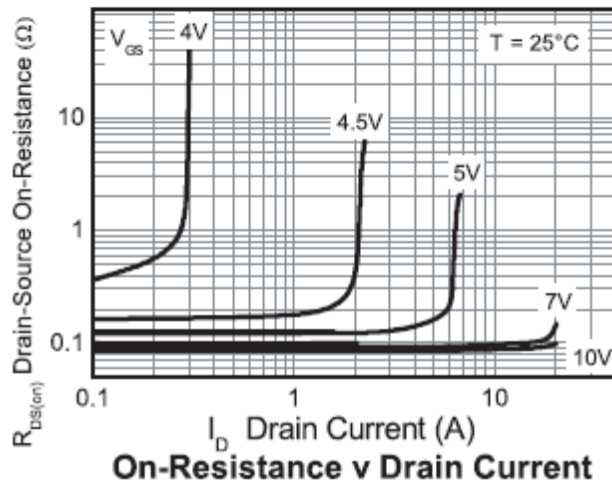
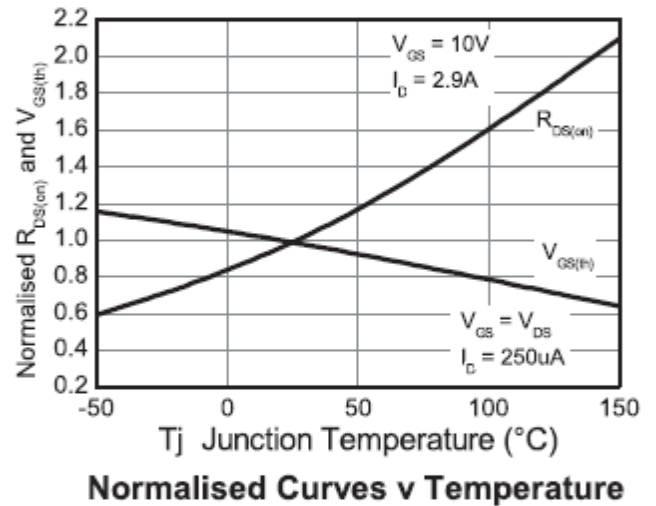
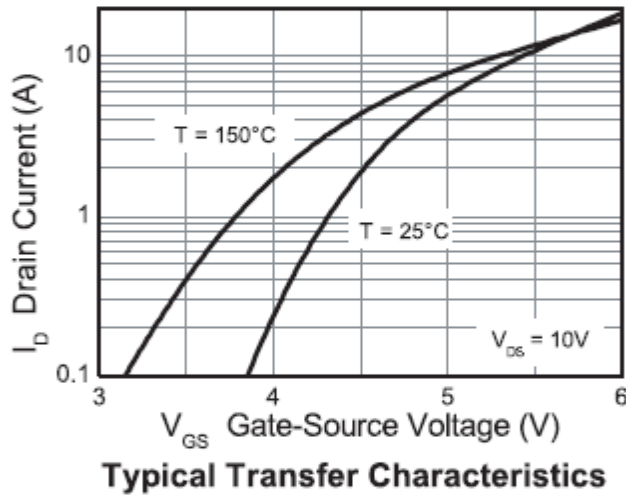
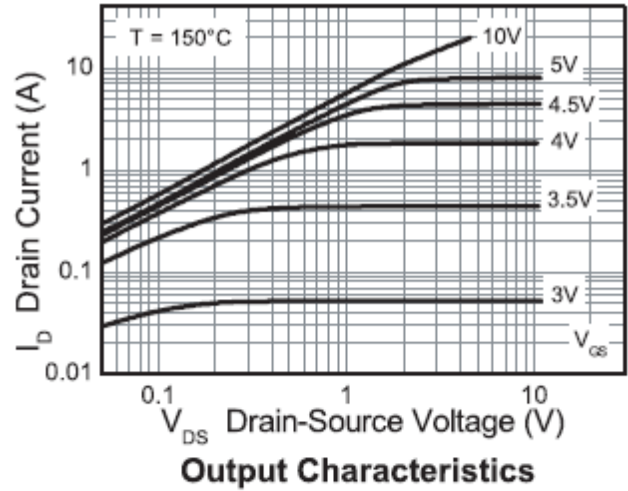
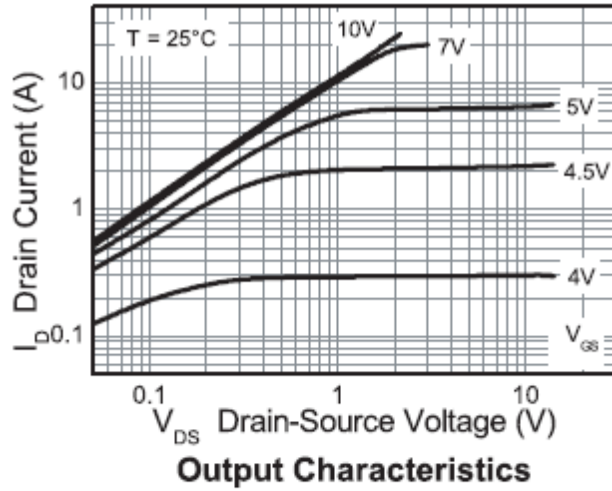
**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)


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

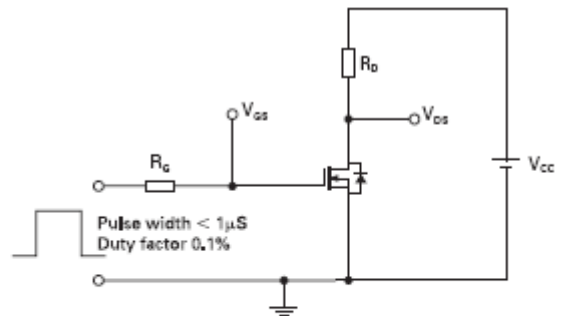
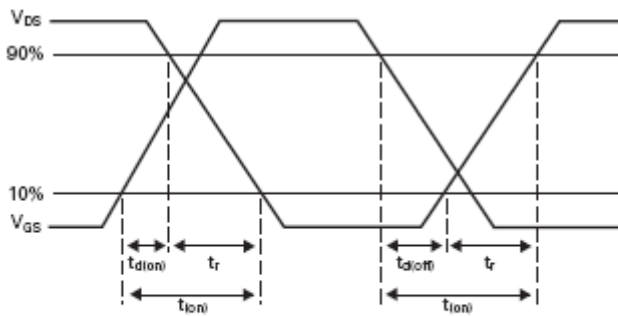
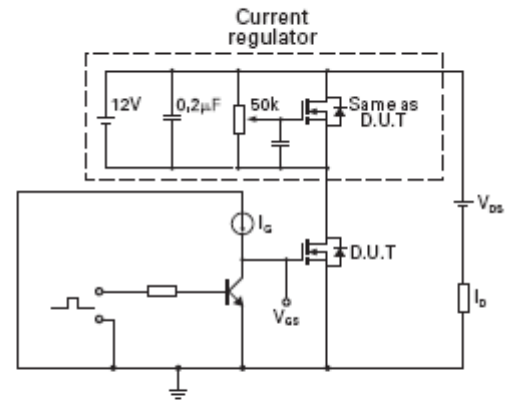
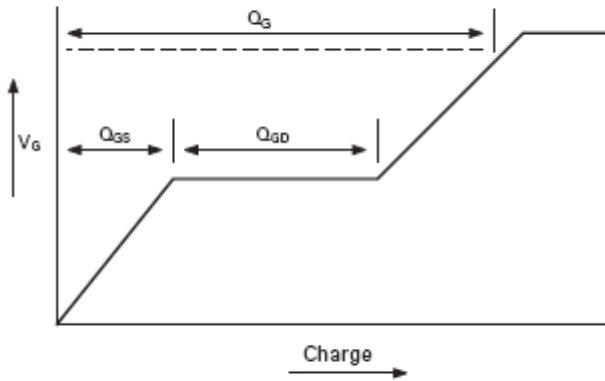
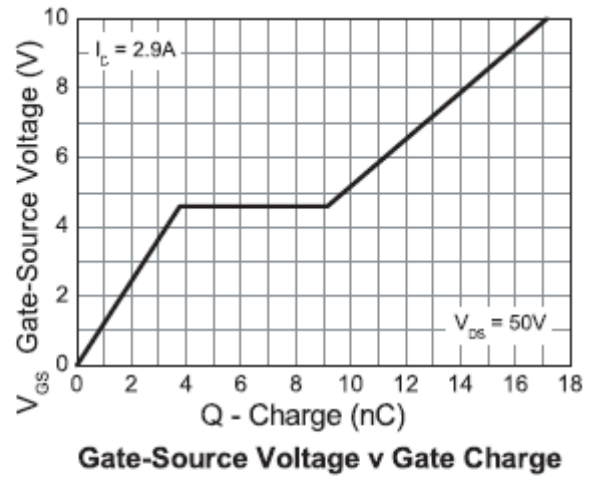
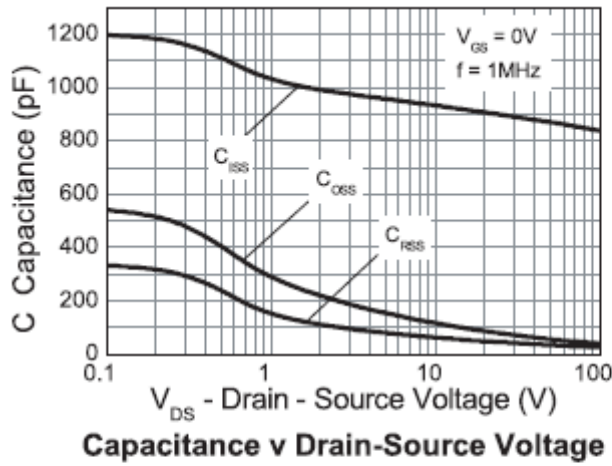
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	2.0	—	4.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	—	125	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.9A
		—	—	150		V <sub>GS</sub> = 6.0V, I <sub>D</sub> = 2.6A
Forward Transfer Admittance	Y <sub>fs</sub>	—	7.3	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 2.9A
Diode Forward Voltage	V <sub>SD</sub>	—	0.85	0.95	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 4.0A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	—	859	—	pF	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	57	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	33	—		
Total Gate Charge	Q <sub>g</sub>	—	9.6	—	nC	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 5.0V, I <sub>D</sub> = 2.9A
Total Gate Charge	Q <sub>g</sub>	—	17	—	nC	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.9A
Gate-Source Charge	Q <sub>gs</sub>	—	3.8	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	5.4	—		
Turn-On Delay Time	t <sub>D(on)</sub>	—	4.9	—	ns	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.0 A, R <sub>G</sub> = 6.0Ω
Turn-On Rise Time	t <sub>r</sub>	—	3.7	—		
Turn-Off Delay Time	t <sub>D(off)</sub>	—	18	—		
Turn-Off Fall Time	t <sub>f</sub>	—	9.4	—		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	—	40.5	—	ns	V <sub>GS</sub> = 0V, I <sub>S</sub> = 2.9A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	—	62	—	nC	

- Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1-inch square copper plate
  6. Short duration pulse test used to minimize self-heating effect.
  7. Guaranteed by design. Not subject to production testing.

**Typical Characteristics**

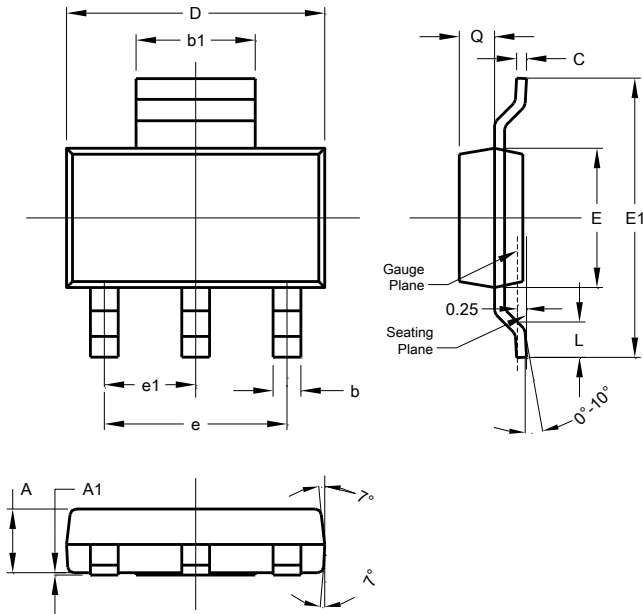


**Typical Characteristics**



**Package Outline Dimensions**

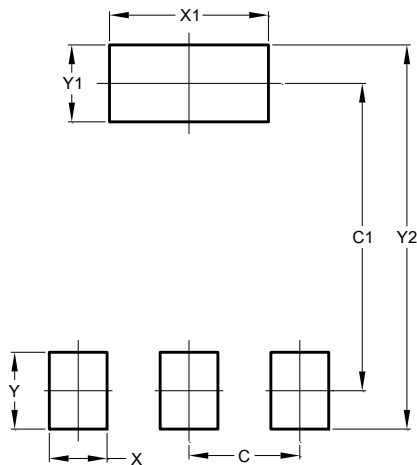
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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