100V SOT223 N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = 25°C$
100V	250mΩ @ V_{GS}= 10V	2.9A
	300mΩ @ 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 e3
- Weight: 0.112 grams (Approximate)

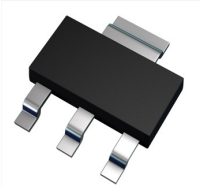
Description

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.

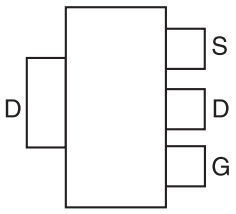
Applications

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

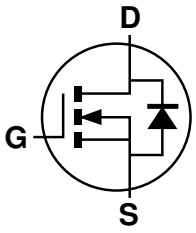
SOT223



Top View



Pin Out - Top



Equivalent Circuit

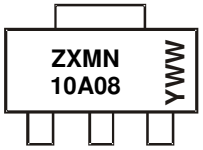
Ordering Information (Note 4)

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 $\overline{Y}$ = Last Digit of Year (ex: 5= 2015)
WW or $\overline{WW}$ = Week Code (01~53)

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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) Linear Derating Factor	P_D	2.0 16	W mW/°C
Power Dissipation at T_A = +25°C (Note 6) Linear Derating Factor	P_D	3.9 31	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	32	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

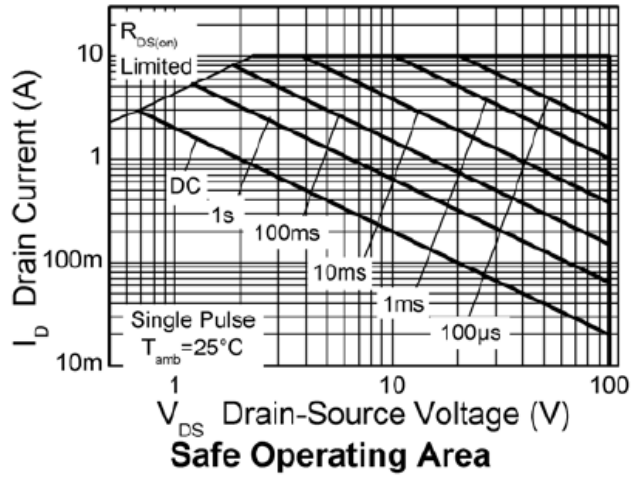
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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	

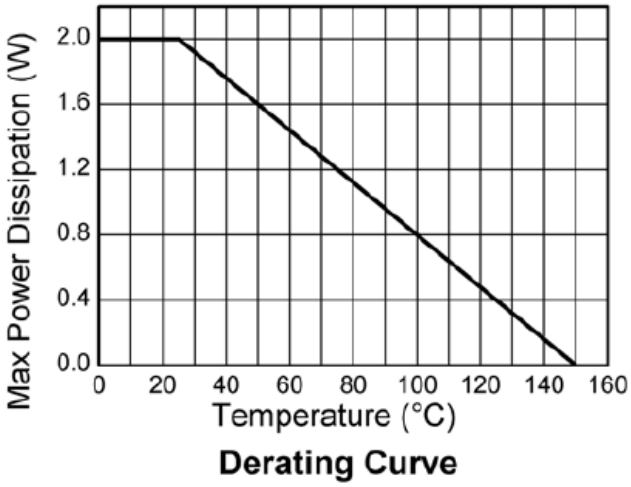
Notes:
5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. For a device surface mounted on FR4 PCB measured at t≦10 secs.
7. Repetitive rating - 25mm x 25mm FR4 PCB, D=0.02, pulse width 300µs - pulse width limited by maximum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

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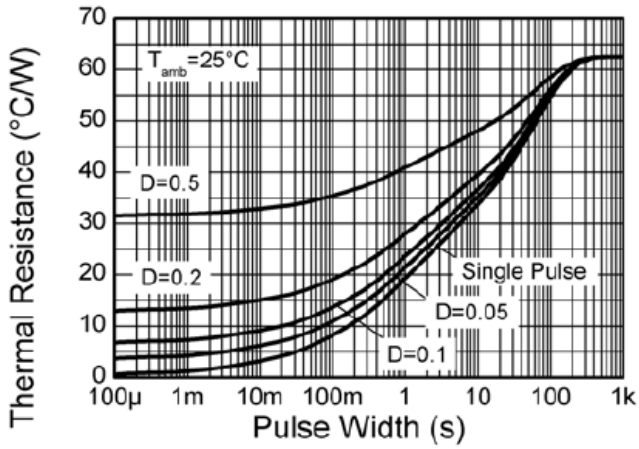
Thermal Characteristics



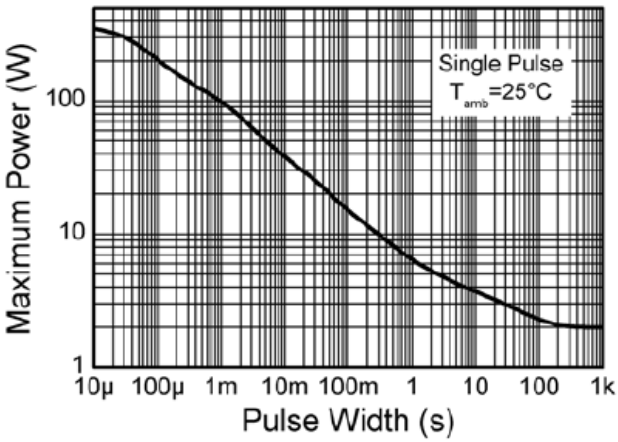
Safe Operating Area



Derating Curve



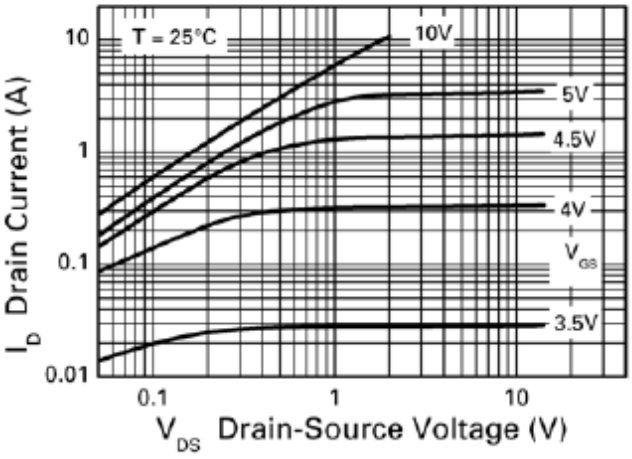
Transient Thermal Impedance



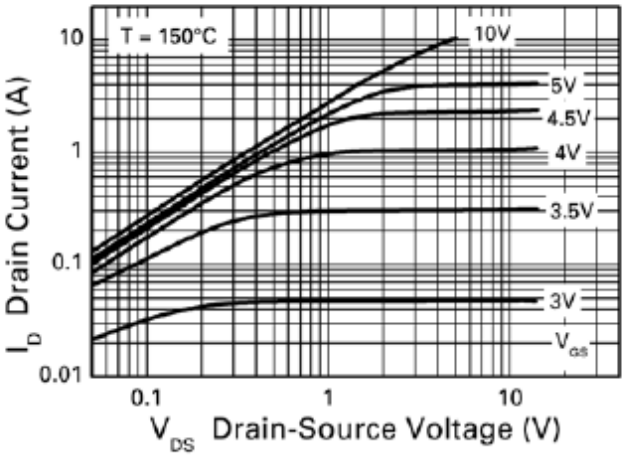
Pulse Power Dissipation

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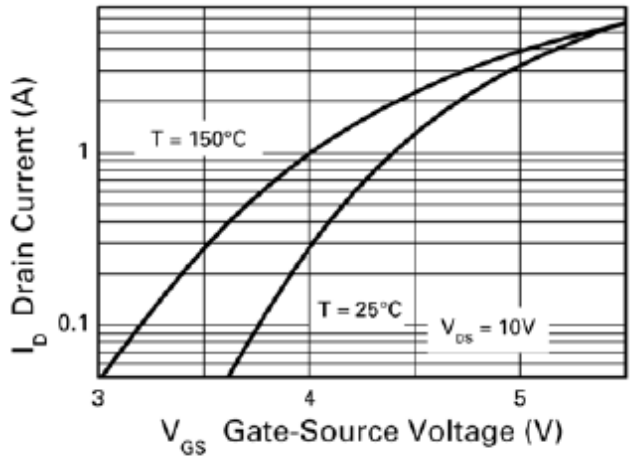
Typical Characteristics



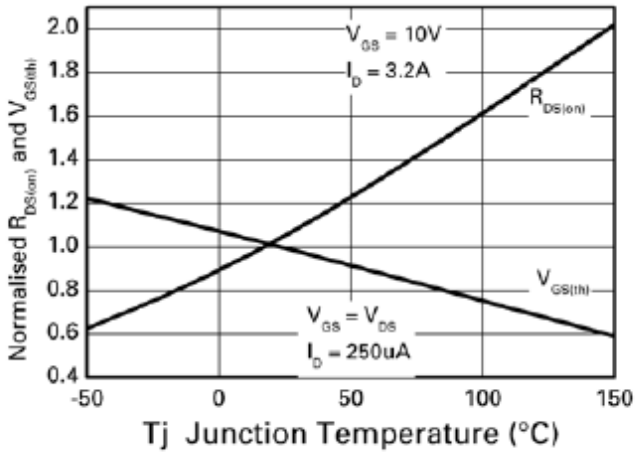
Output Characteristics



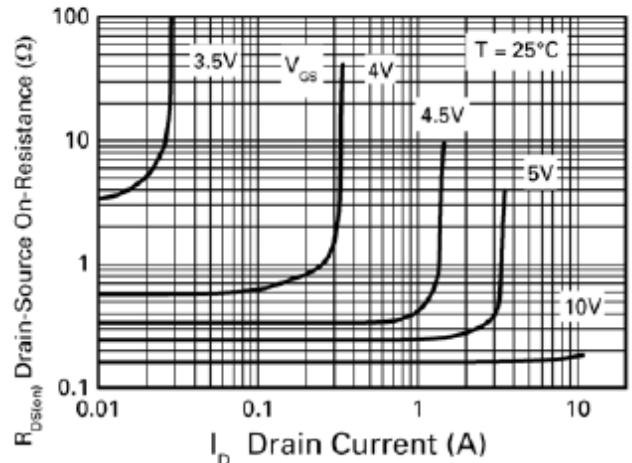
Output Characteristics



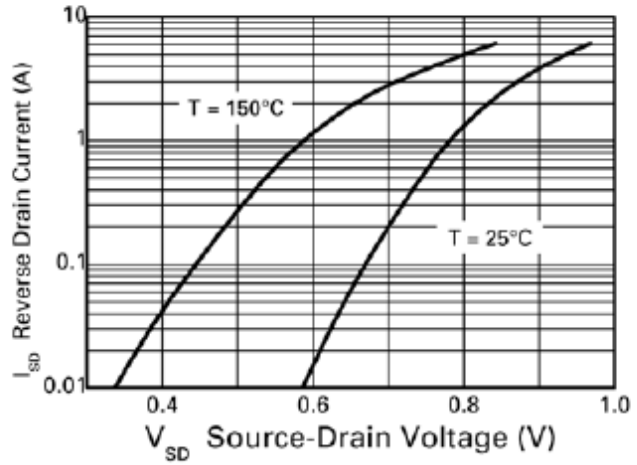
Typical Transfer Characteristics



Normalised Curves v Temperature



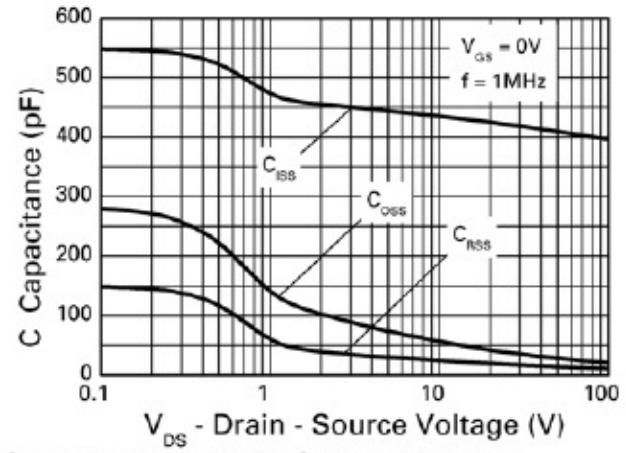
On-Resistance v Drain Current



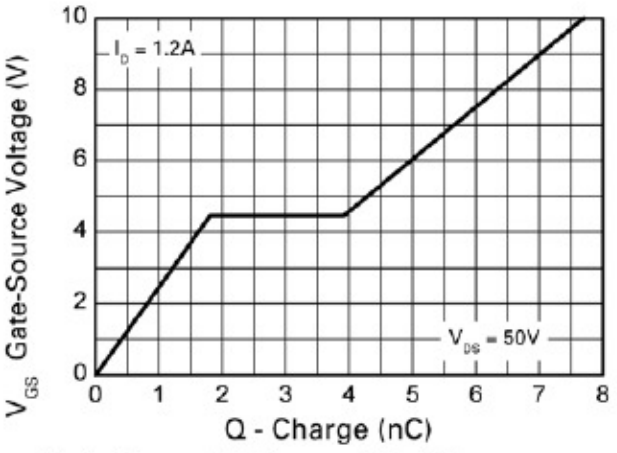
Source-Drain Diode Forward Voltage

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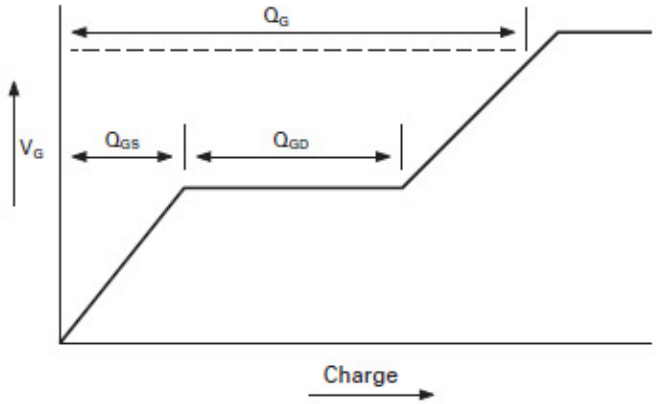
Typical Characteristics (continued)



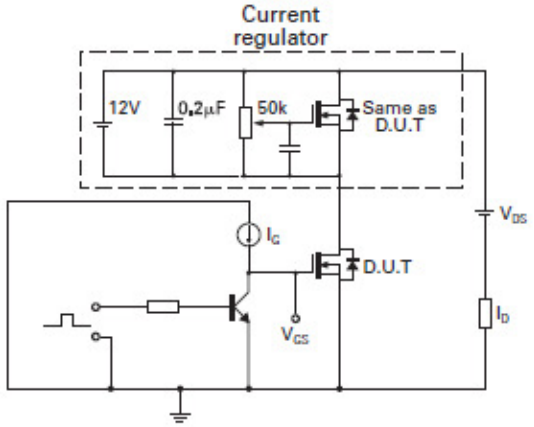
Capacitance v Drain-Source Voltage



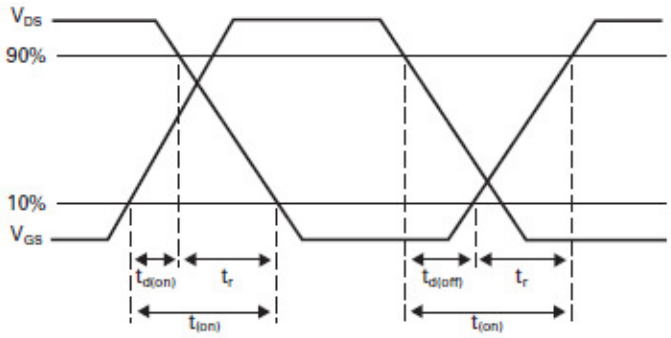
Gate-Source Voltage v Gate Charge



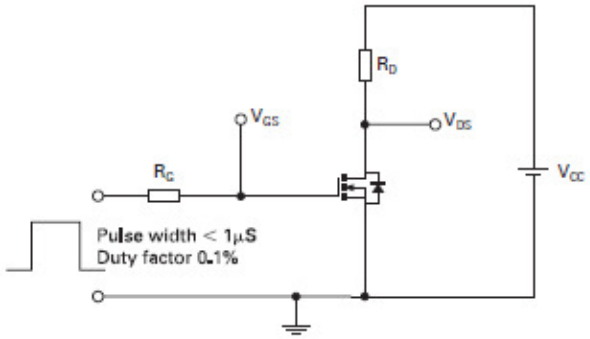
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

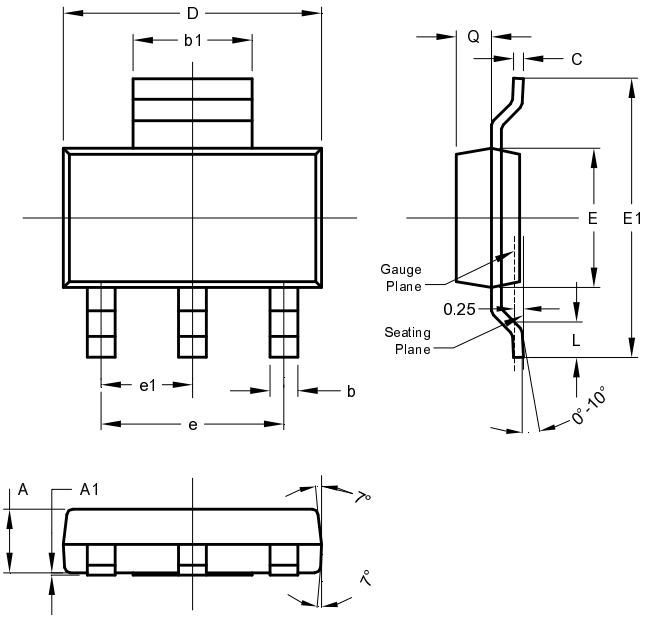


Switching time test circuit

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Package Outline Dimensions

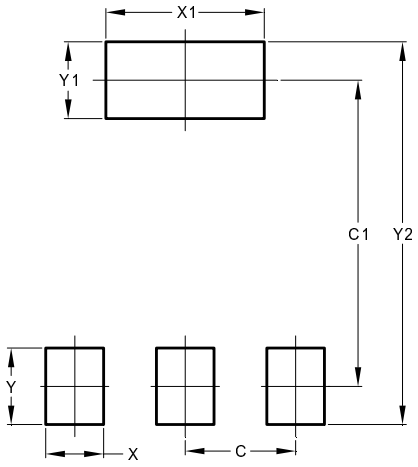
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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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