Product Summary

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

Description and Applications

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.

- DC motor control
- DC-AC inverters

Features and Benefits

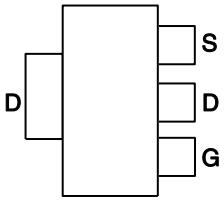
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

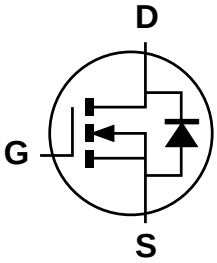
- Package: SOT223 (Type DN)
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)

Top View



Pin Out - Top View



Equivalent Circuit

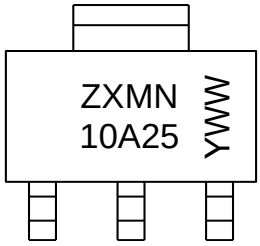
Ordering Information (Note 4)

Part Number	Package	Package	
		Qty.	Carrier
ZXMN10A25GTA	SOT223 (Type DN)	1,000	Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/

Marking Information

SOT223



ZXMN 10A25 = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 2= 2022)
WW or $\overline{WW}$ = Week Code (01~53)

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

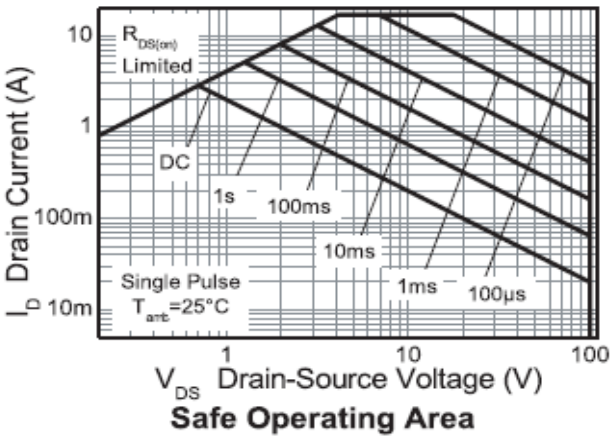
Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current, V_{GS} = 10V, t ≦10 sec	T_A = +25°C T_A = +70°C	I_D	4.0 3.2	A
Continuous Drain Current (Note 5) V_{GS} = 10V	T_A = +25°C	I_D	2.9	A
Maximum Continuous Body Diode Forward Current (Note 5)		I_S	2.9	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)		I_{DM}	17	A
Pulsed Source Current (10µs pulse, duty cycle = 1%)		I_{SM}	17	A

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

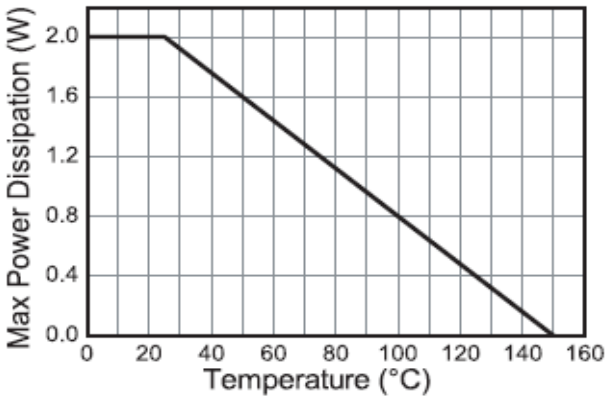
Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5), T_A = +25°C Linear Derating Factor	P_D	2.0 16	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	62.5	°C/W
Total Power Dissipation (Note 5), TA = +25°C, t ≦10 seconds Linear Derating Factor	P_D	3.9 31	W mW/°C
Thermal Resistance, Junction to Ambient, t ≦10 seconds (Note 5)	$R_{\theta JA}$	32	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Note: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1-inch square copper plate

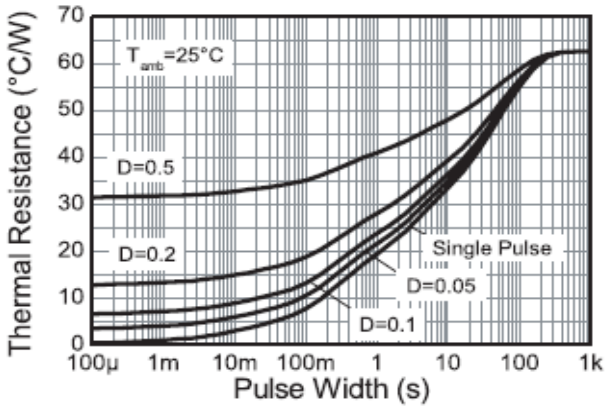
Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)



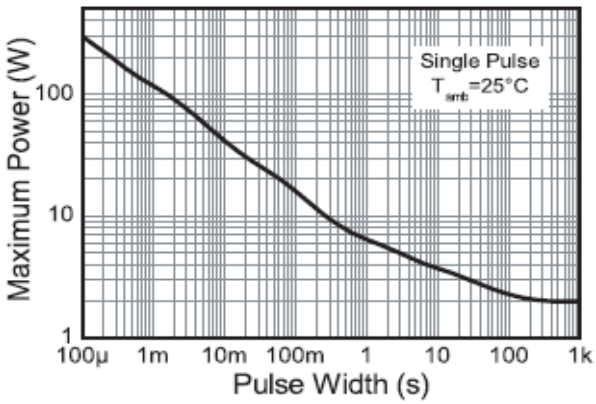
Safe Operating Area



Derating Curve



Transient Thermal Impedance



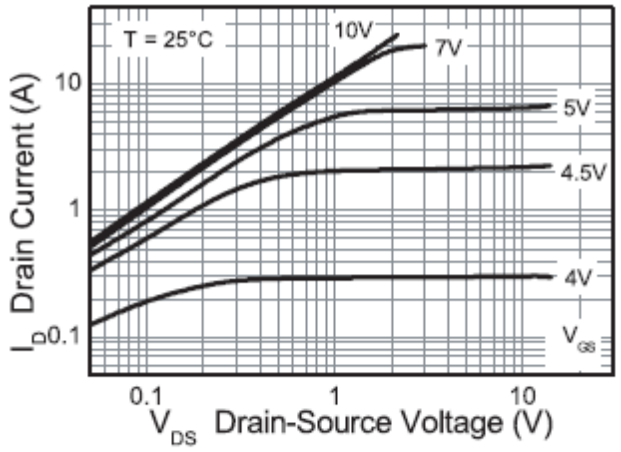
Pulse Power Dissipation

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

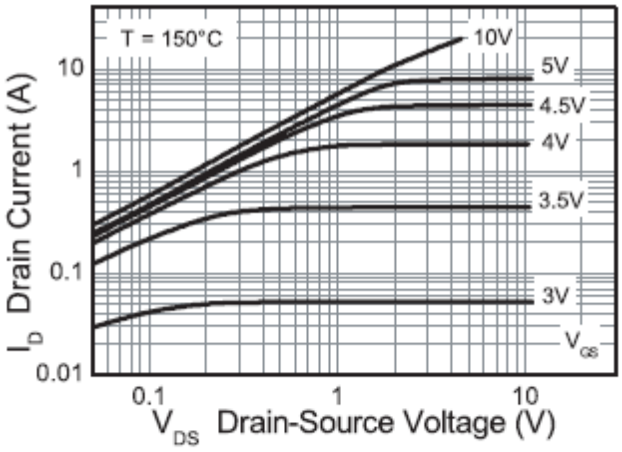
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	µA	V_{DS} = 100V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	125	mΩ	V_{GS} = 10V, I_D = 2.9A
		—	—	150		V_{GS} = 6.0V, I_D = 2.6A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	7.3	—	S	V_{DS} = 15V, I_D = 2.9A
Diode Forward Voltage	V_{SD}	—	0.85	0.95	V	V_{GS} = 0V, I_S = 4.0A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	859	—	pF	V_{DS} = 50V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	57	—		
Reverse Transfer Capacitance	C_{rss}	—	33	—		
Total Gate Charge	Q_g	—	9.6	—	nC	V_{DS} = 50V, V_{GS} = 5.0V, I_D = 2.9A
Total Gate Charge	Q_g	—	17	—	nC	V_{DS} = 50V, V_{GS} = 10V, I_D = 2.9A
Gate-Source Charge	Q_{gs}	—	3.8	—		
Gate-Drain Charge	Q_{gd}	—	5.4	—		
Turn-On Delay Time	$t_{D(on)}$	—	4.9	—	ns	V_{DS} = 50V, V_{GS} = 10V, I_D = 1.0 A, R_G = 6.0Ω
Turn-On Rise Time	t_r	—	3.7	—		
Turn-Off Delay Time	$t_{D(off)}$	—	18	—		
Turn-Off Fall Time	t_f	—	9.4	—		
Body Diode Reverse Recovery Time	t_{rr}	—	40.5	—	ns	V_{GS} = 0V, I_S = 2.9A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{rr}	—	62	—	nC	

Notes: 6 .Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to production testing.

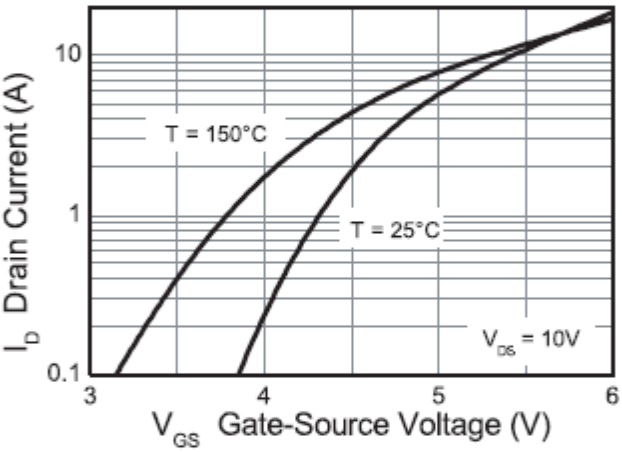
Typical Characteristics



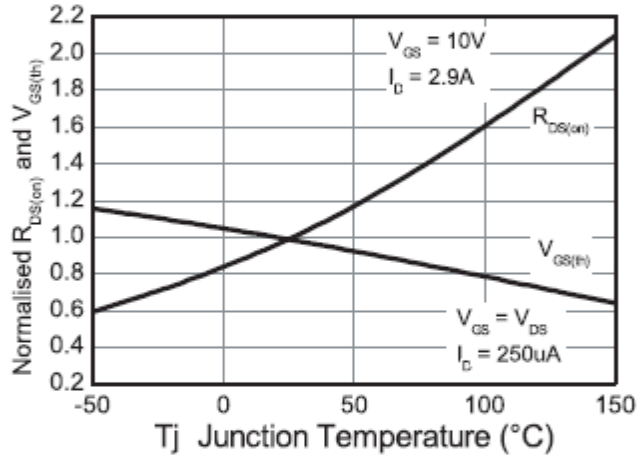
Output Characteristics



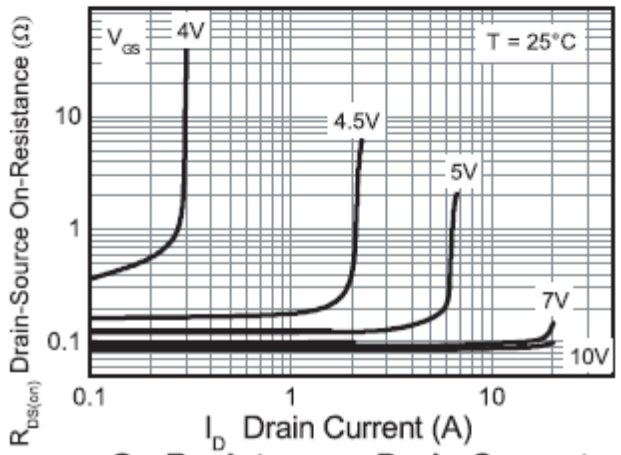
Output Characteristics



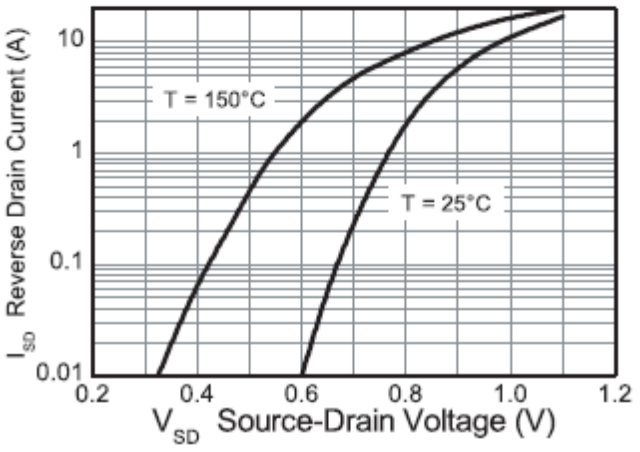
Typical Transfer Characteristics



Normalised Curves v Temperature

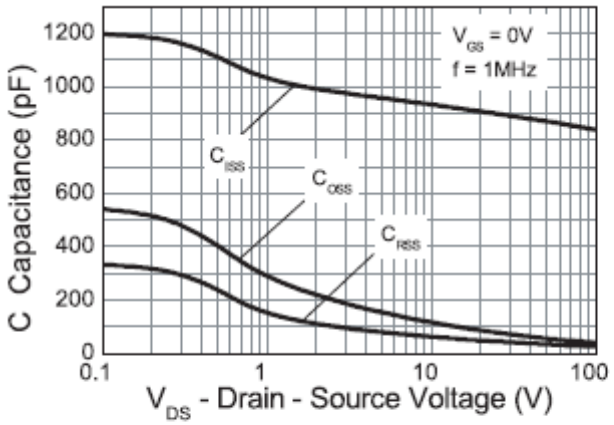


On-Resistance v Drain Current

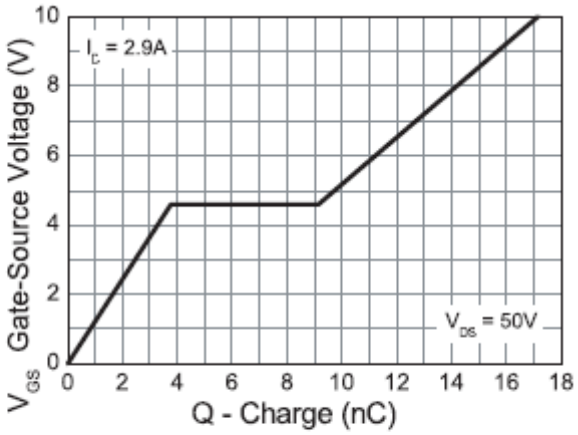


Source-Drain Diode Forward Voltage

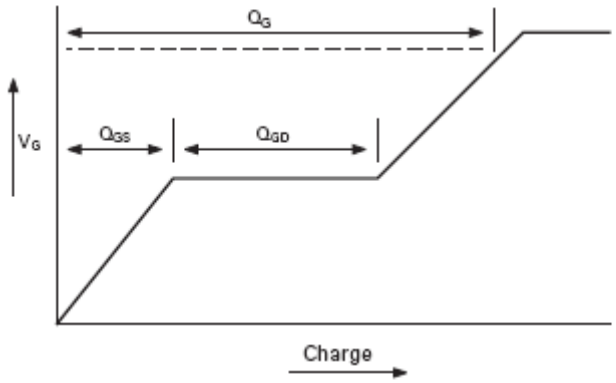
Typical Characteristics



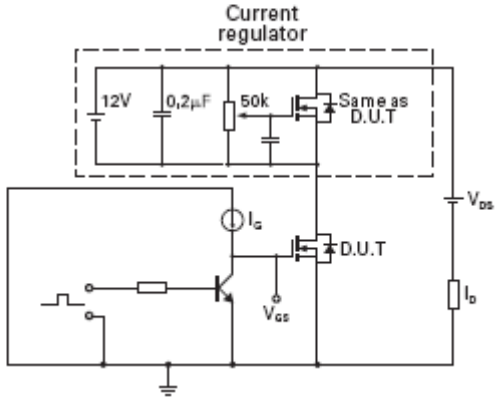
Capacitance v Drain-Source Voltage



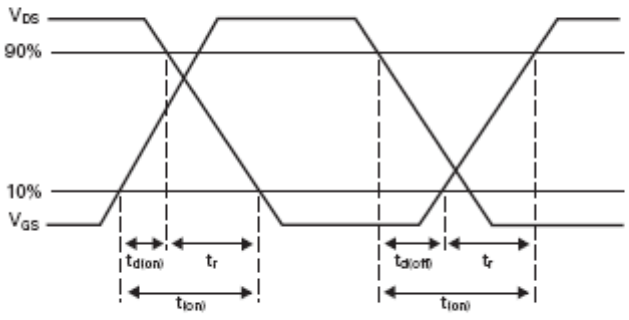
Gate-Source Voltage v Gate Charge



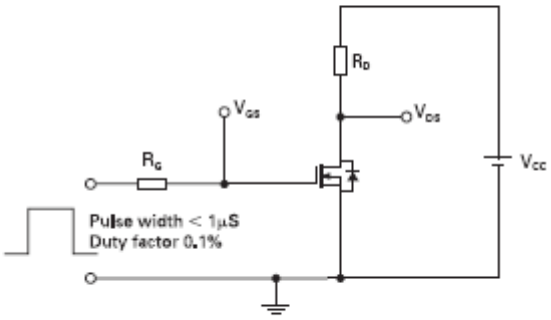
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

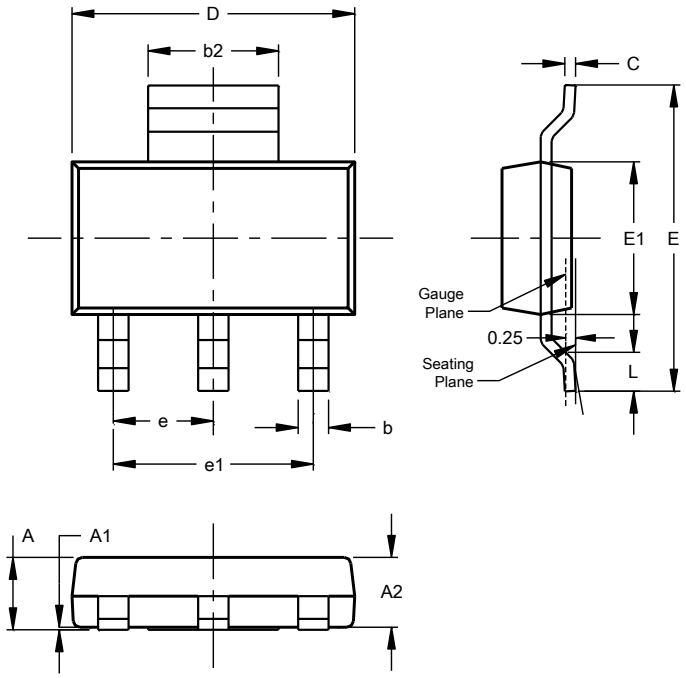


Switching time test circuit

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT223 (Type DN)

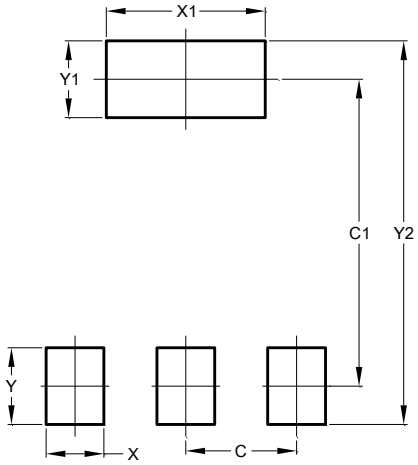


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT223 (Type DN)



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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