30V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
30V	0.11Ω @ V_{GS} = 10V	4.7A

Description and Applications

This MOSFET has been 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-DC Converters
- Audio Output Stage
- Relay and Solenoid Driving
- Motor Control

Features and Benefits

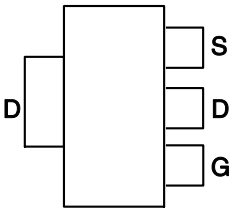
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

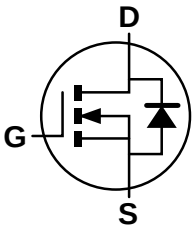
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223

Top View



Pin Out - Top



Equivalent Circuit

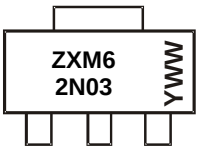
Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXM62N03GTA	ZXM62N03	7	12	1,000
ZXM62N03GTC	ZXM62N03	13	12	4,000

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



ZXM62N03 = 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 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (V_{GS} = 10V, T_A = +25°C) (Note 6)	I_D	4.7	A
(V_{GS} = 10V, T_A = +70°C) (Note 6)		3.8	
(V_{GS} = 10V, T_A = +25°C) (Note 5)		3.4	
Pulsed Drain Current (Note 7)	I_{DM}	16	A
Continuous Source Current (Body Diode) (Note 6)	I_S	2.6	A
Pulsed Source Current (Body Diode) (Note 7)	I_{SM}	16	A

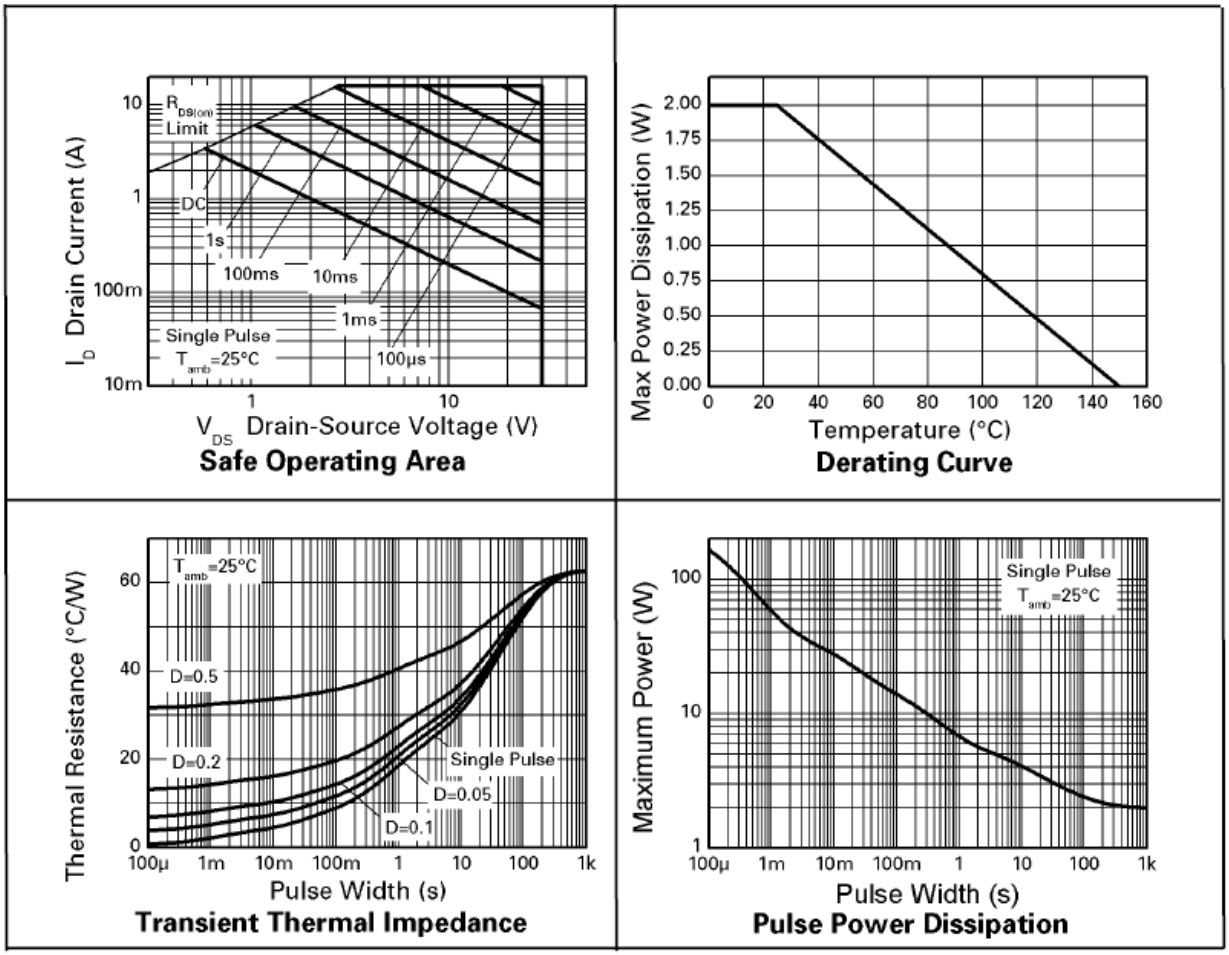
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

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

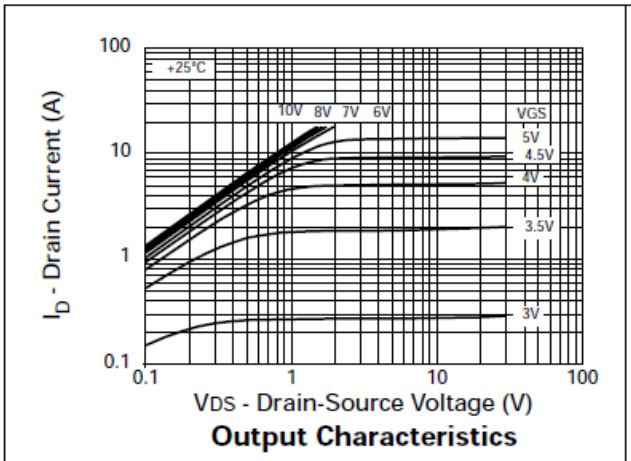
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	-	-	1	µA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	1	-	-	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	-	- -	0.11 0.15	Ω	V_{GS} = 10V, I_D = 2.2A V_{GS} = 4.5V, I_D = 1.1A
Forward Transconductance (Notes 8 & 10)	g_{fs}	1.1	-	-	S	V_{DS} = 15V, I_D = 1.1A
Diode Forward Voltage (Note 8)	V_{SD}	-	-	0.95	V	T_J = +25°C, I_S = 2.2A, V_{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	-	380	-	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	90	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	30	-	pF	
Turn-On Delay Time (Note 9)	$t_{D(ON)}$	-	2.9	-	ns	V_{DD} = 15V, I_D = 2.2A, V_{GS} = 10V, R_{GS} = 6Ω
Turn-On Rise Time (Note 9)	t_R	-	5.6	-	ns	
Turn-Off Delay Time (Note 9)	$t_{D(OFF)}$	-	11.7	-	ns	
Turn-Off Fall Time (Note 9)	t_F	-	6.4	-	ns	
Total Gate Charge (Note 9)	Q_g	-	-	9.6	nC	V_{DS} = 24V, V_{GS} = 10V, I_D = 2.2A
Gate-Source Charge (Note 9)	Q_{gs}	-	-	1.7	nC	
Gate-Drain Charge (Note 9)	Q_{gd}	-	-	2.8	nC	
Reverse Recovery Time	t_{RR}	-	18.8	-	ns	T_J = +25°C, I_F = 2.2A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	-	11.4	-	nC	

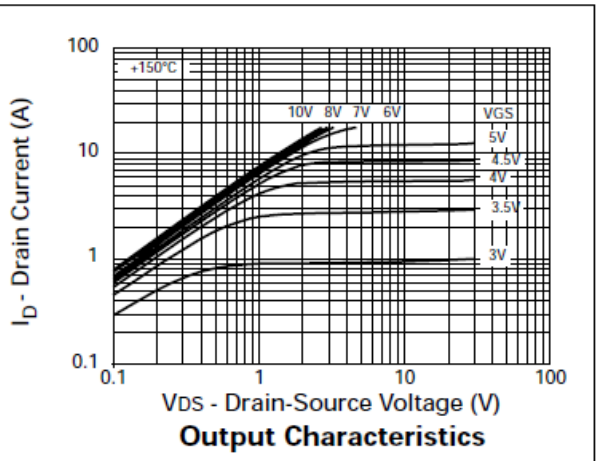
Notes:
5. For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. For a device surface mounted on FR-4 PCB measured at t ≤ 10 seconds.
7. Repetitive rating 25mm x 25mm FR-4 PCB, D = 0.05 pulse width limited by maximum junction temperature.
8. Measured under pulsed conditions. Width = 300µs. Duty cycle ≤ 2%.
9. Switching characteristics are independent of operating junction temperature.
10. For design aid only, not subject to production testing.



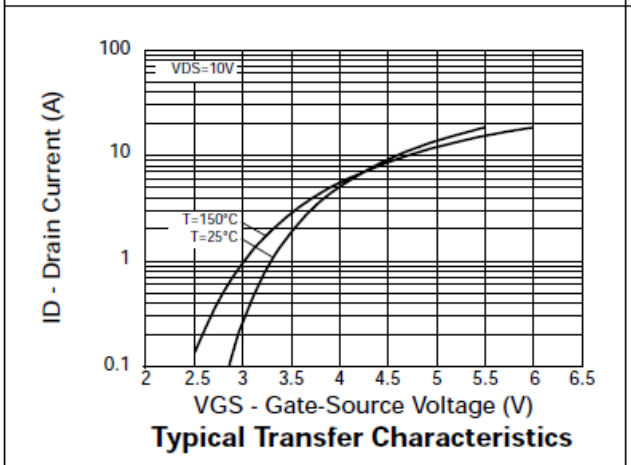
Typical Characteristics



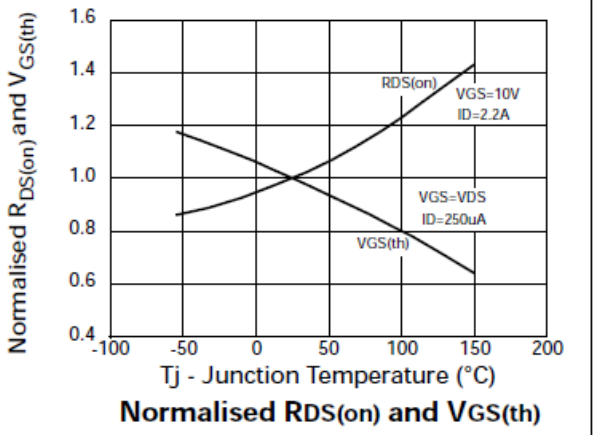
Output Characteristics



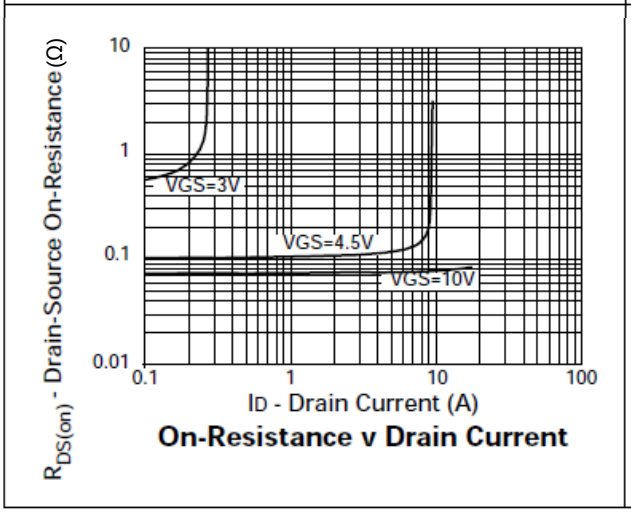
Output Characteristics



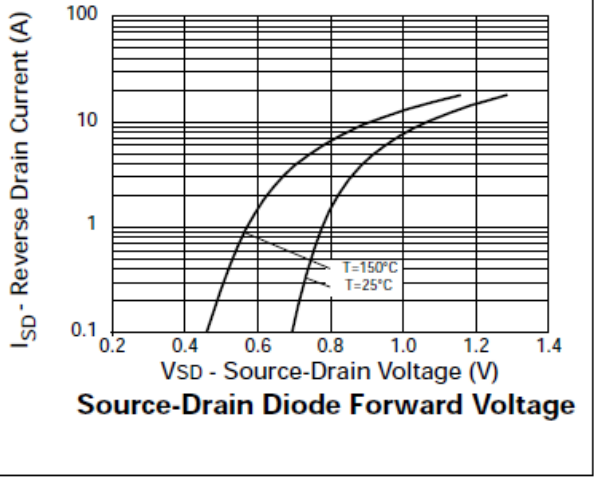
Typical Transfer Characteristics



Normalised RDS(on) and VGS(th) v Temperature

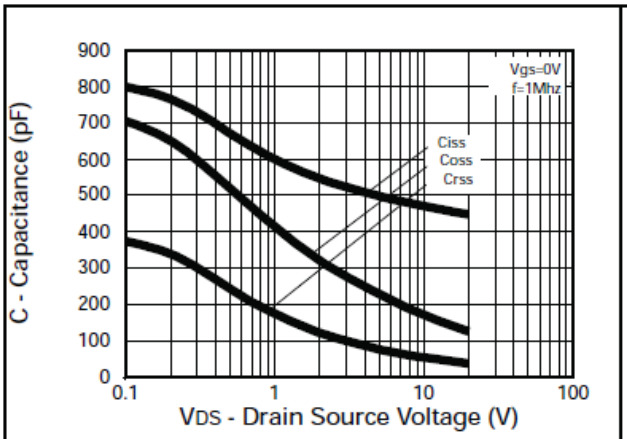


On-Resistance v Drain Current

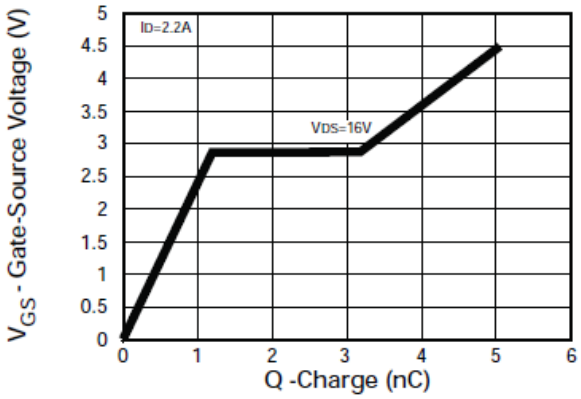


Source-Drain Diode Forward Voltage

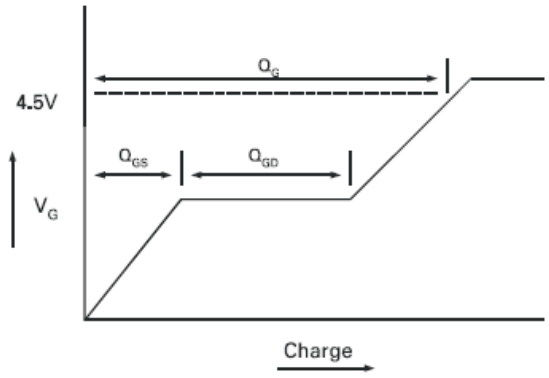
Typical Characteristics (Cont.)



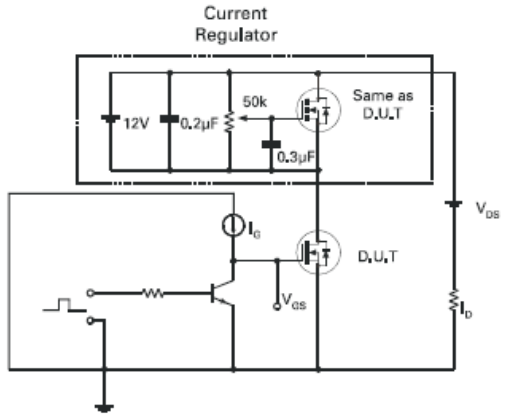
Capacitance v Drain-Source Voltage



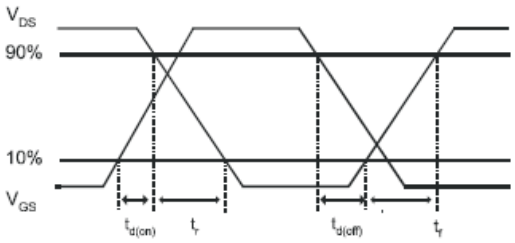
Gate-Source Voltage v Gate Charge



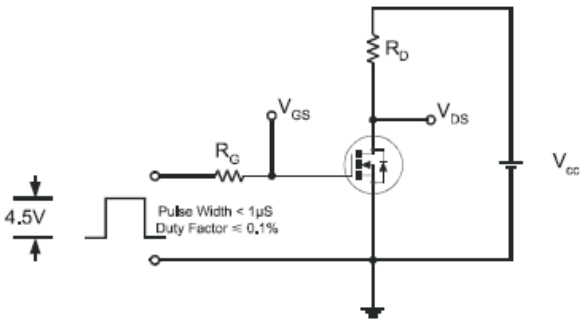
Basic Gate Charge Waveform



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.

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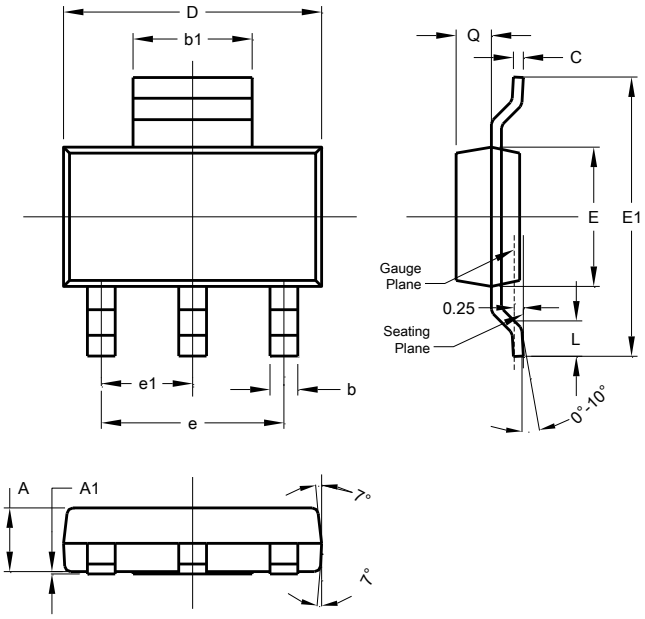

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Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

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

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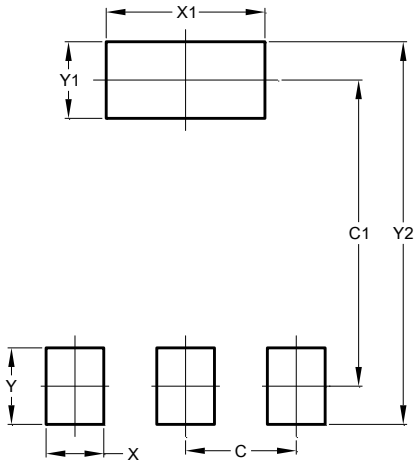

Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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