ZXMN10A07F

100V N-CHANNEL ENHANCEMENT MODE MOSFET IN SOT23 PACKAGE

Product Summary

BV_{DSS}	$R_{DS(ON)\ Max}$	I_D T_A = +25°C (Note 6)
100V	700mΩ @ V_{GS} = 10V	0.76A
	900mΩ @ V_{GS} = 6V	0.67A

Features

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

Description

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.

Mechanical Data

- Case: SOT23
- 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
- Weight: 0.008 grams (approximate)

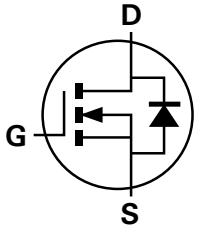
Applications

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

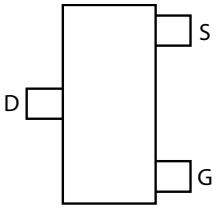
SOT23



Top View



Device Symbol



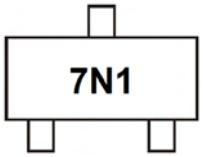
Top View
Pin-Out

Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN10A07FTA	7N1	7	8	3,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com 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

Marking Information



7N1 = Product Type Marking Code

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

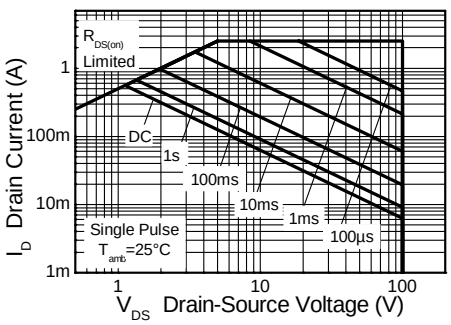
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	100	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current	Steady State	@ V_{GS} = 10V; T_A = +25°C (Note 6) @ V_{GS} = 10V; T_A = +70°C (Note 6) @ V_{GS} = 10V; T_A = +100°C (Note 6) @ V_{GS} = 10V; T_A = +25°C (Note 5)	I_D	0.8 0.6 0.5 0.7	A
Pulsed Drain Current (Note 7)			I_{DM}	3.5	A
Continuous Source Current (Body Diode) (Note 6)			I_S	0.5	A
Pulsed Source Current (Body Diode) (Note 7)			I_{SM}	3.5	A

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

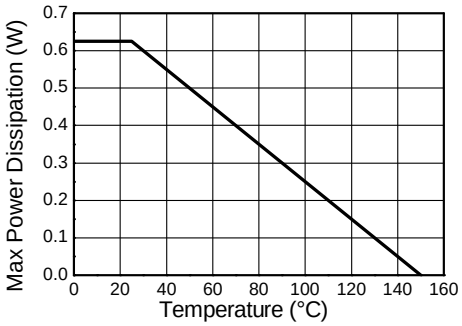
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	625	mW
Power Dissipation (Note 6)	P_D	806	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	155	°C/W
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	194	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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 sec.
7. Repetitive rating - 25mm x 25mm FR4 PCB, D = 0.02, pulse width 300µs – pulse width limited by maximum junction temperature.
8. Thermal resistance from junction to solder-point (at the end of the drain lead).

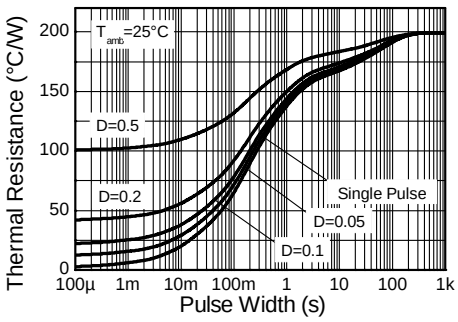
Thermal Characteristics



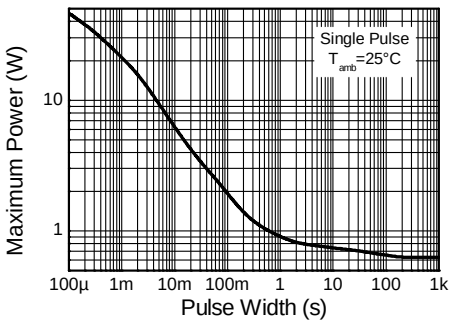
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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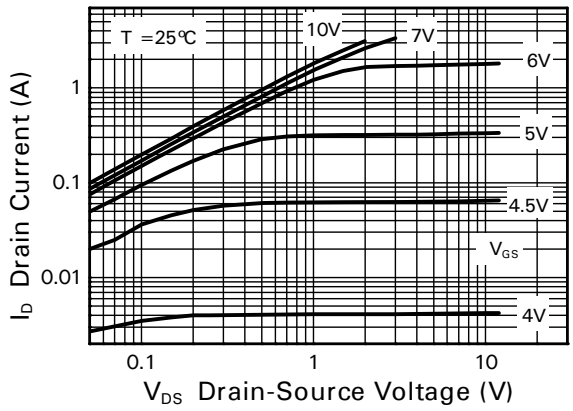
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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 T_J = +25°C	I_{DSS}	—	—	1.0	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	—	4	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance (Note 9)	$R_{DS\ (ON)}$	—	540	700	mΩ	V_{GS} = 10V, I_D = 1.5A
			700	900		V_{GS} = 6V, I_D = 1A
Forward Transconductance (Notes 9 & 11)	g_{fs}	—	1.6	—	S	V_{DS} = 15V, I_D = 1A
Diodes Forward Voltage (Note 9)	V_{SD}	—	0.85	0.95	V	T_J = +25°C, I_S = 1.5A, V_{GS} = 0V
DYNAMIC CHARACTERISTICS						
Input Capacitance (Notes 10 & 11)	C_{iss}	—	138	280	pF	V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance (Notes 10 & 11)	C_{oss}	—	12	25		
Reverse Transfer Capacitance (Notes 10 & 11)	C_{rss}	—	6	12		
Gate Resistance (Notes 10 & 11)	R_g	—	2	4	Ω	f = 1MHz, V_{GS} = 0V, V_{DS} = 0V
Total Gate Charge (Notes 10 & 11)	Q_g	—	2.9	6	nC	V_{GS} = 10V, V_{DS} = 50V, I_D = 1A
Gate-Source Charge (Notes 10 & 11)	Q_{gs}	—	0.7	1.5		
Gate-Drain Charge (Notes 10 & 11)	Q_{gd}	—	1	2		
Reverse Recovery Time (Note 11)	t_{rr}	—	27	60	ns	T_J = +25°C, I_F = 1.8A, di/dt = 100A/µs
Reverse Recovery Charge (Note 11)	Q_{rr}	—	12	—	nC	
Turn-On Delay Time (Notes 10 & 11)	$t_{D(on)}$	—	1.8	—	ns	V_{GS} = 10V, V_{DD} = 50V, R_G = 6Ω , I_D = 1A
Turn-On Rise Time (Notes 10 & 11)	t_r	—	1.5	—		
Turn-Off Delay Time (Notes 10 & 11)	$t_{D(off)}$	—	4.1	—		
Turn-Off Fall Time (Notes 10 & 11)	t_f	—	2.1	—		

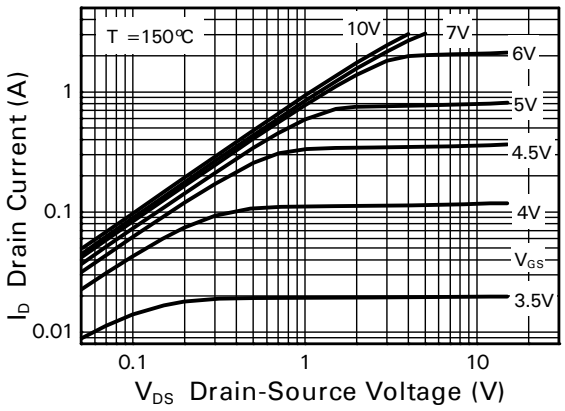
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300µs; duty cycle ≤ 2%.
10. Switching characteristics are independent of operating junction temperature.
11. For design aid only, not subject to production testing.

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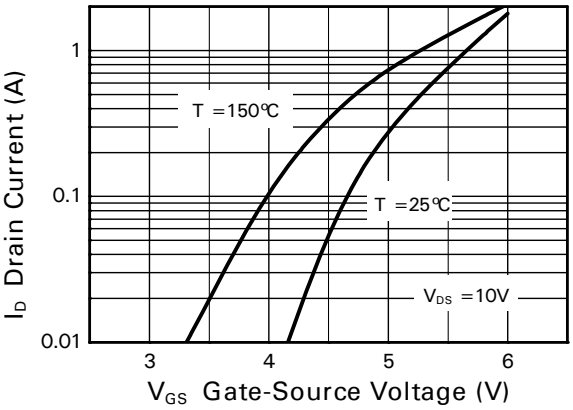
Typical Characteristics



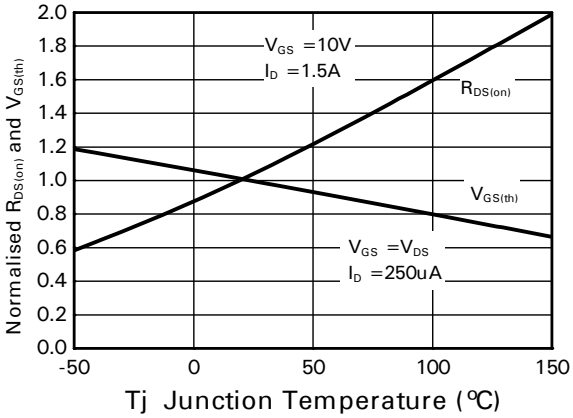
Output Characteristics



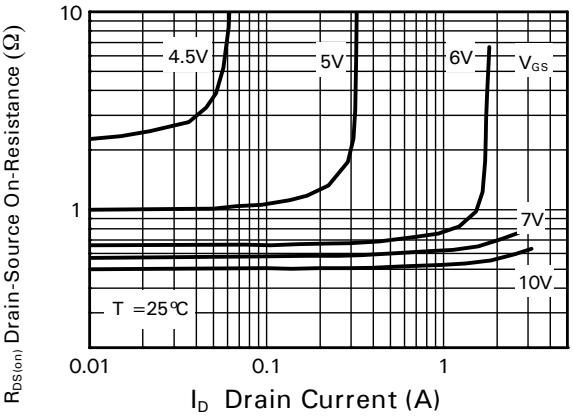
Output Characteristics



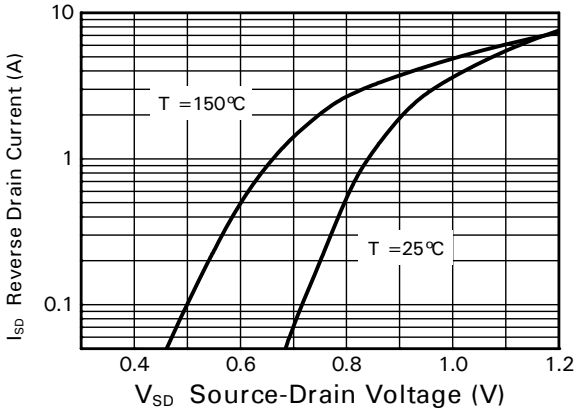
Typical Transfer Characteristics



Normalised Curves v Temperature



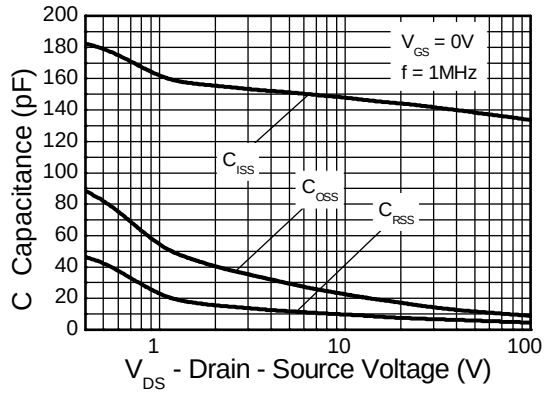
On-Resistance v Drain Current



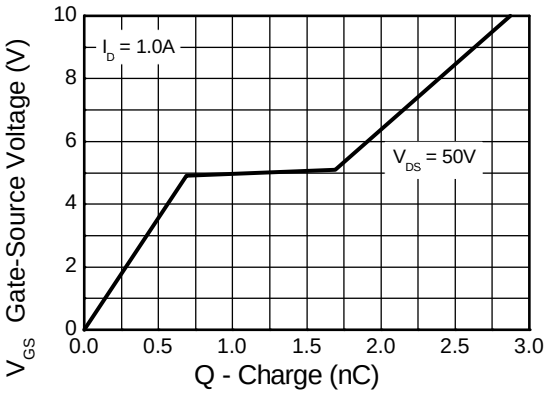
Source-Drain Diode Forward Voltage

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Typical Characteristics (cont.)

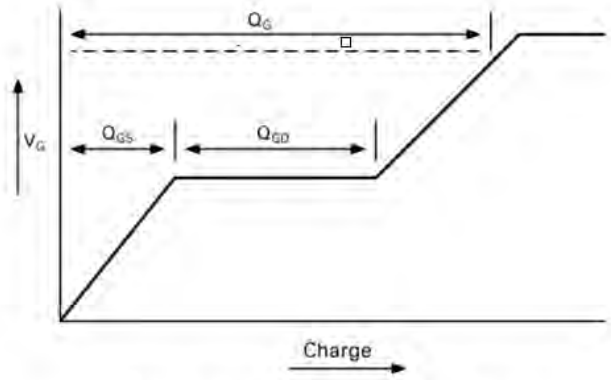


Capacitance v Drain-Source Voltage

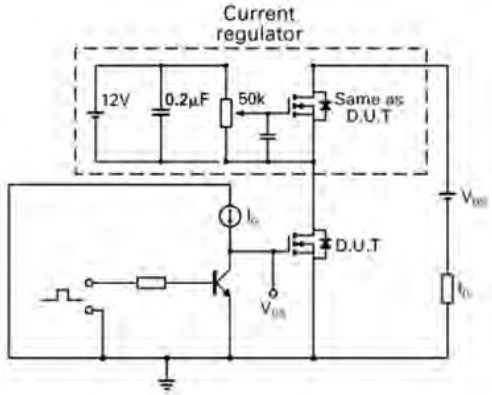


Gate-Source Voltage v Gate Charge

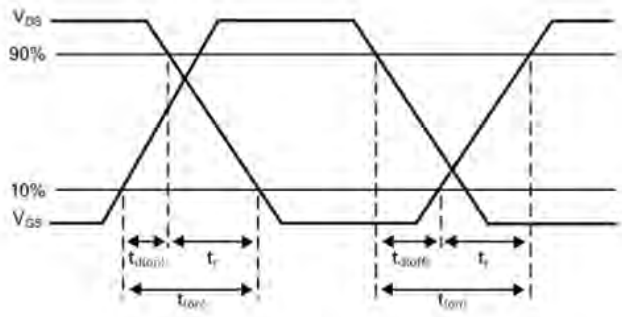
Test Circuits



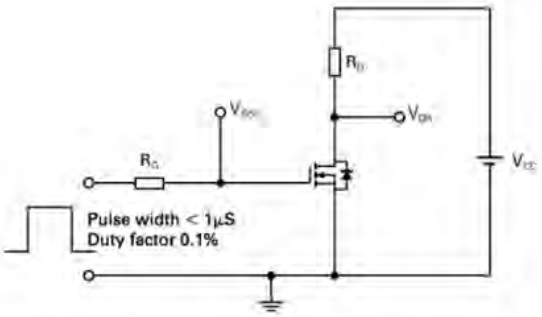
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

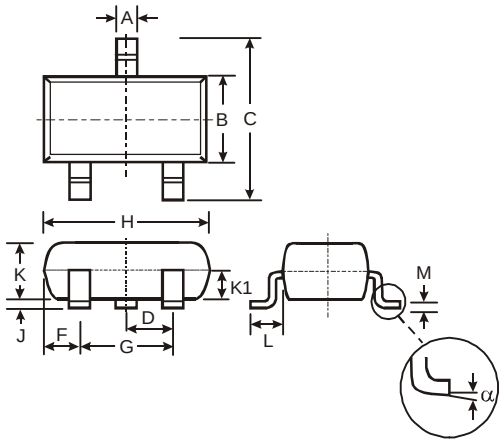


Switching time test circuit

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Package Outline Dimensions

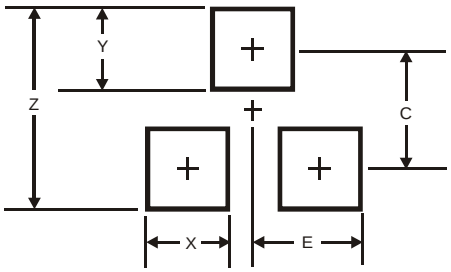
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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