

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

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.

Applications

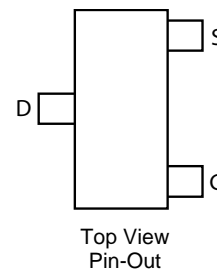
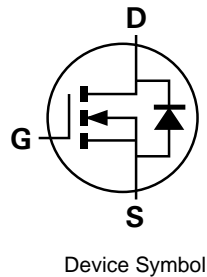
- DC-DC Converters
- Power Management Functions
- Motor Control
- Disconnect switches

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**

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)

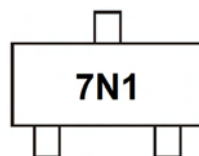


Ordering Information (Note 4)

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

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

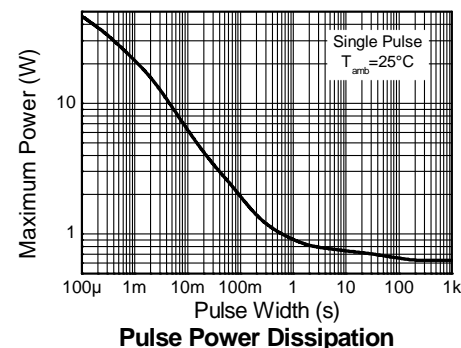
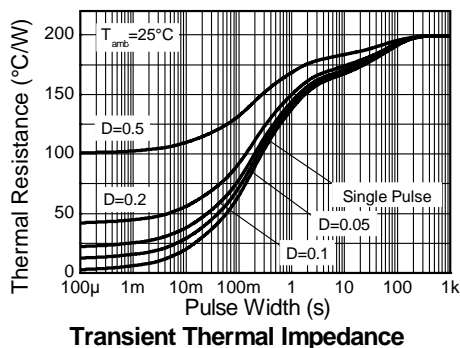
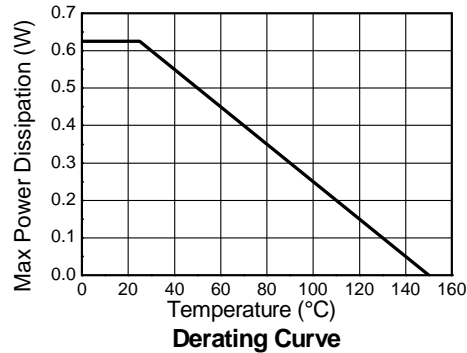
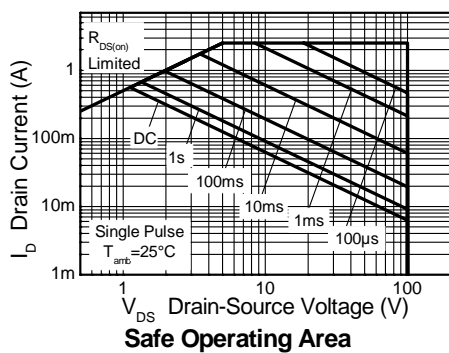
Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current	Steady State	@ $V_{GS} = 10\text{V}$; $T_A = +25^\circ\text{C}$ (Note 6)	0.8	A
		@ $V_{GS} = 10\text{V}$; $T_A = +70^\circ\text{C}$ (Note 6)	0.6	
		@ $V_{GS} = 10\text{V}$; $T_A = +100^\circ\text{C}$ (Note 6)	0.5	
		@ $V_{GS} = 10\text{V}$; $T_A = +25^\circ\text{C}$ (Note 5)	0.7	
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 (@ $T_A = +25^\circ\text{C}$, 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	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	155	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	194	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- 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 $t \leq 10$ sec.
 7. Repetitive rating - 25mm x 25mm FR4 PCB, $D = 0.02$, pulse width 300 μs – pulse width limited by maximum junction temperature.
 8. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics

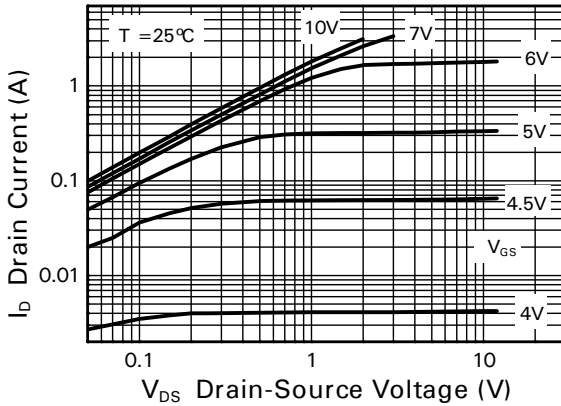


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

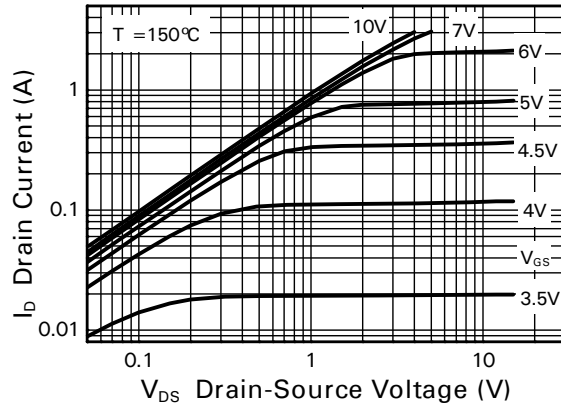
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	100	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	1.0	μA	V _{DS} = 100V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±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.

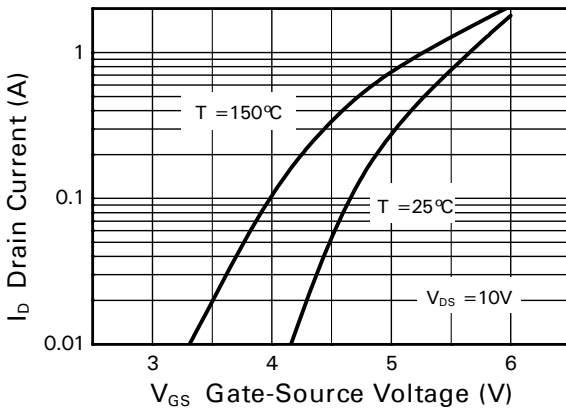
Typical Characteristics



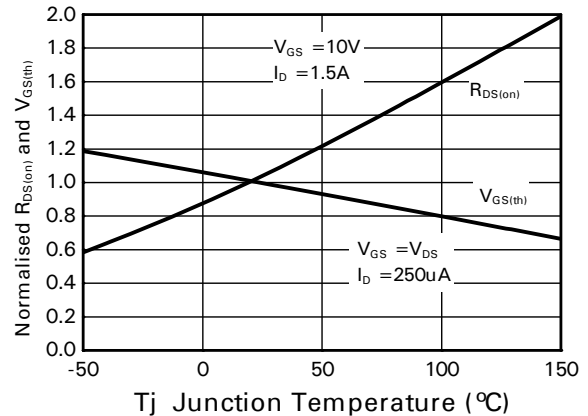
Output Characteristics



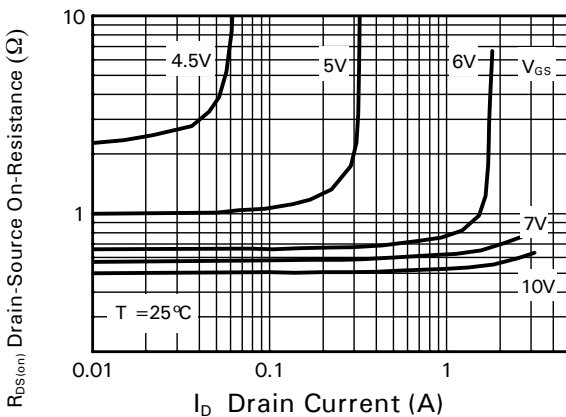
Output Characteristics



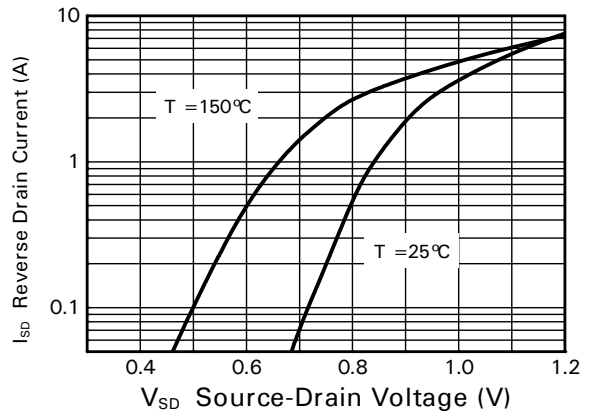
Typical Transfer Characteristics



Normalised Curves v Temperature

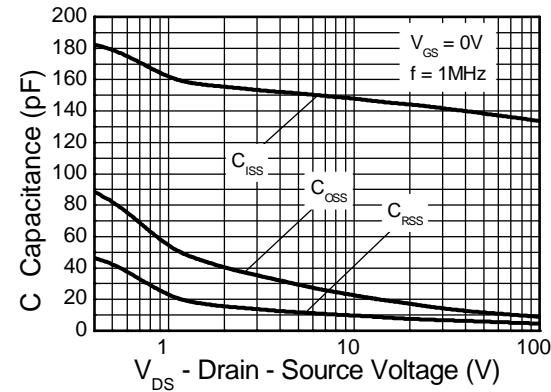


On-Resistance v Drain Current

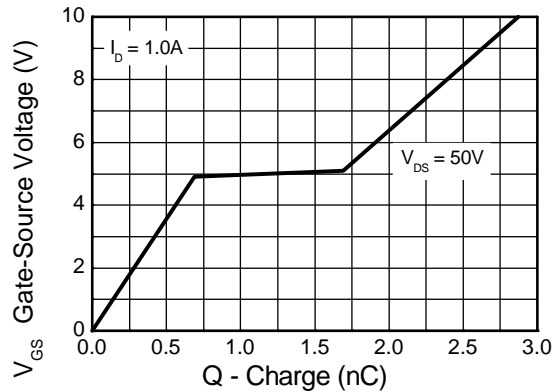


Source-Drain Diode Forward Voltage

Typical Characteristics (cont.)

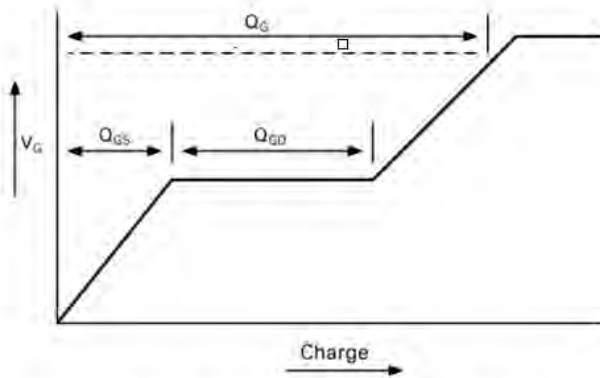


Capacitance v Drain-Source Voltage

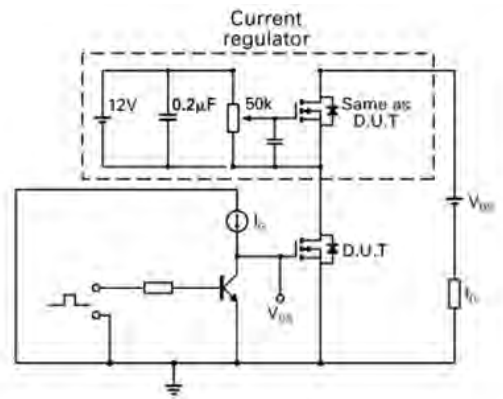


Gate-Source Voltage v Gate Charge

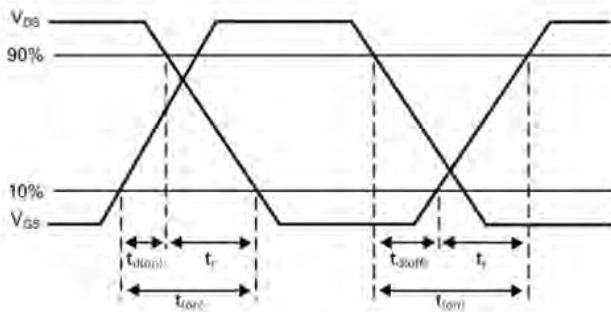
Test Circuits



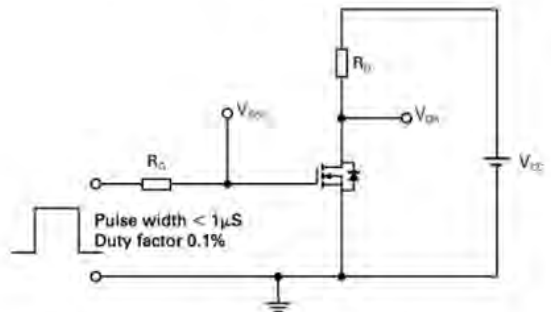
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

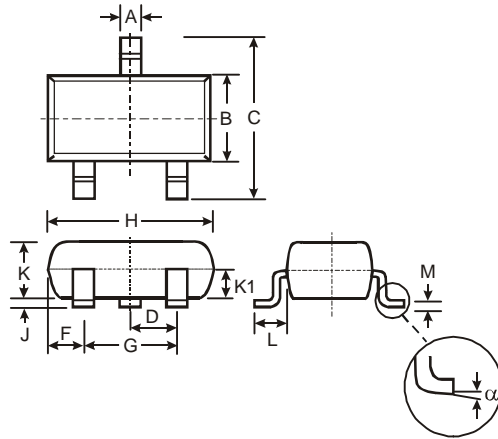


Switching time test circuit

ZXMN10A07F

Package Outline Dimensions

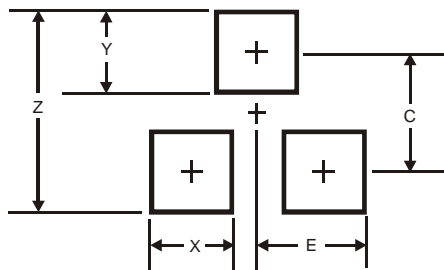
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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