

**ZXMN10A07F**

**100V N-CHANNEL ENHANCEMENT MODE MOSFET IN SOT23 PACKAGE**

**Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> T <sub>A</sub> = +25°C (Note 6)
100V	700mΩ @ V <sub>GS</sub> = 10V	0.76A
	900mΩ @ V <sub>GS</sub> = 6V	0.67A

**Description**

This MOSFET has been designed to minimize the on-state resistance (R<sub>DS(on)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

**Applications**

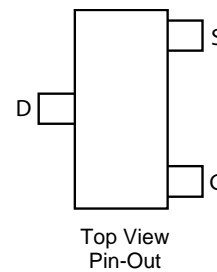
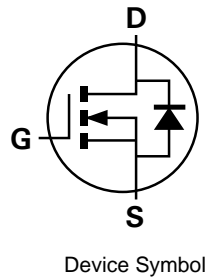
- DC-DC Converters
- Power Management Functions
- Motor Control
- Disconnect switches

**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)

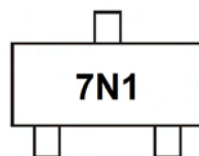


**Ordering Information** (Note 4)

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<sub>A</sub> = +25°C, unless otherwise specified.)

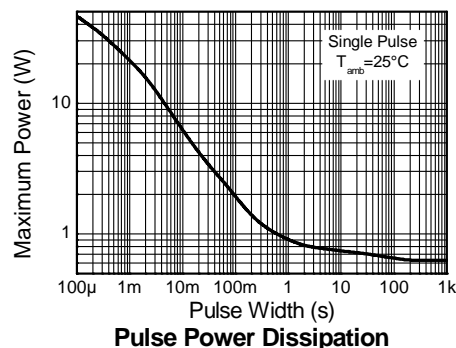
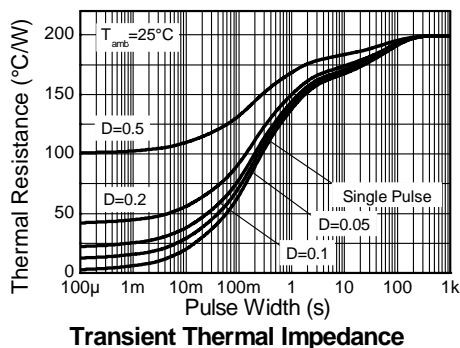
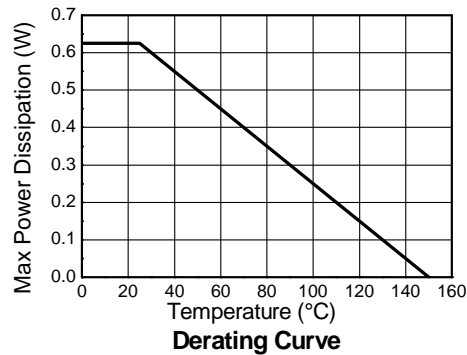
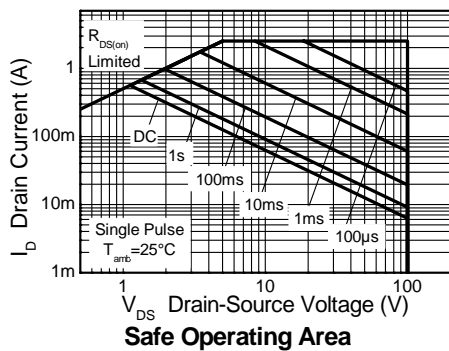
Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V <sub>DSS</sub>	100	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Continuous Drain Current	Steady State	@ V <sub>GS</sub> = 10V; T <sub>A</sub> = +25°C (Note 6)	0.8	A
		@ V <sub>GS</sub> = 10V; T <sub>A</sub> = +70°C (Note 6)	0.6	
		@ V <sub>GS</sub> = 10V; T <sub>A</sub> = +100°C (Note 6)	0.5	
		@ V <sub>GS</sub> = 10V; T <sub>A</sub> = +25°C (Note 5)	0.7	
Pulsed Drain Current (Note 7)		I <sub>DM</sub>	3.5	A
Continuous Source Current (Body Diode) (Note 6)		I <sub>S</sub>	0.5	A
Pulsed Source Current (Body Diode) (Note 7)		I <sub>SM</sub>	3.5	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	625	mW
Power Dissipation (Note 6)	P <sub>D</sub>	806	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	155	°C/W
Thermal Resistance, Junction to Leads (Note 8)	R <sub>θJL</sub>	194	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-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**

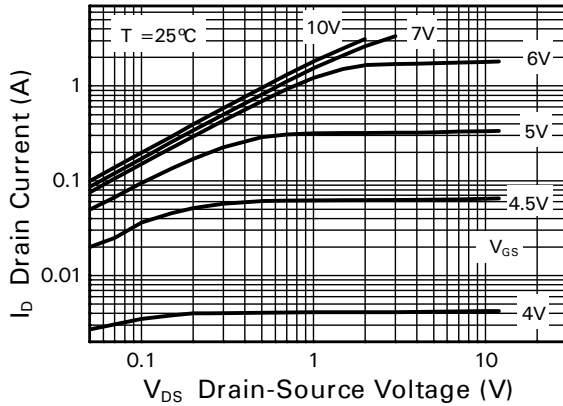


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

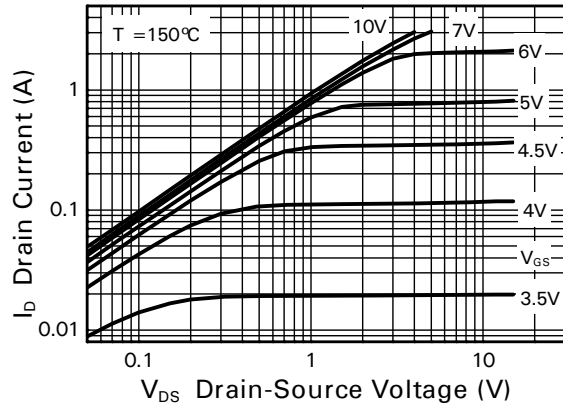
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	1.0	μA	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	2	—	4	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance (Note 9)	R <sub>DS(on)</sub>	—	540	700	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.5A
			700	900		V <sub>GS</sub> = 6V, I <sub>D</sub> = 1A
Forward Transconductance (Notes 9 & 11)	g <sub>fs</sub>	—	1.6	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 1A
Diodes Forward Voltage (Note 9)	V <sub>SD</sub>	—	0.85	0.95	V	T <sub>J</sub> = +25°C, I <sub>S</sub> = 1.5A, V <sub>GS</sub> = 0V
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance (Notes 10 & 11)	C <sub>iss</sub>	—	138	280	pF	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance (Notes 10 & 11)	C <sub>oss</sub>	—	12	25		
Reverse Transfer Capacitance (Notes 10 & 11)	C <sub>rss</sub>	—	6	12		
Gate Resistance (Notes 10 & 11)	R <sub>g</sub>	—	2	4	Ω	f = 1MHz, V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V
Total Gate Charge (Notes 10 & 11)	Q <sub>g</sub>	—	2.9	6	nC	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, I <sub>D</sub> = 1A
Gate-Source Charge (Notes 10 & 11)	Q <sub>gs</sub>	—	0.7	1.5		
Gate-Drain Charge (Notes 10 & 11)	Q <sub>gd</sub>	—	1	2		
Reverse Recovery Time (Note 11)	t <sub>rr</sub>	—	27	60	ns	T <sub>J</sub> = +25°C, I <sub>F</sub> = 1.8A, di/dt = 100A/μs
Reverse Recovery Charge (Note 11)	Q <sub>rr</sub>	—	12	—	nC	
Turn-On Delay Time (Notes 10 & 11)	t <sub>D(on)</sub>	—	1.8	—	ns	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 50V, R <sub>G</sub> = 6Ω, I <sub>D</sub> = 1A
Turn-On Rise Time (Notes 10 & 11)	t <sub>r</sub>	—	1.5	—		
Turn-Off Delay Time (Notes 10 & 11)	t <sub>D(off)</sub>	—	4.1	—		
Turn-Off Fall Time (Notes 10 & 11)	t <sub>f</sub>	—	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.

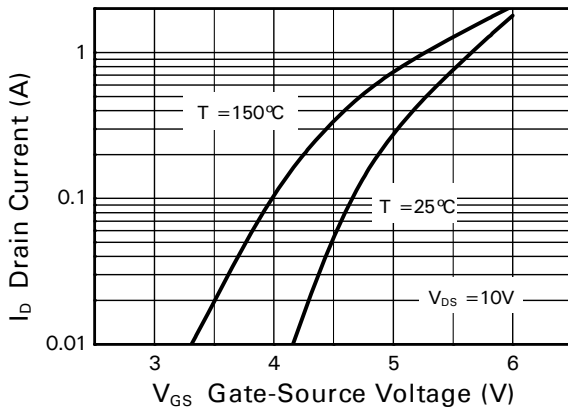
**Typical Characteristics**



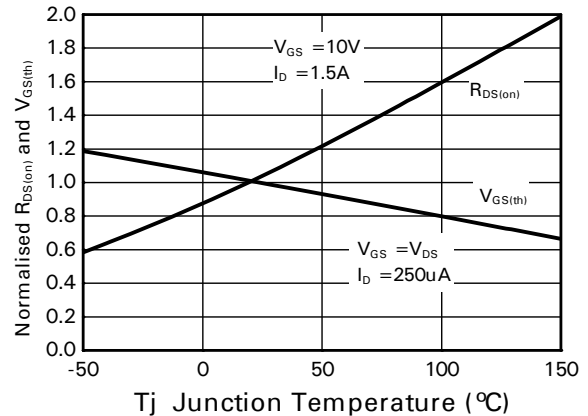
**Output Characteristics**



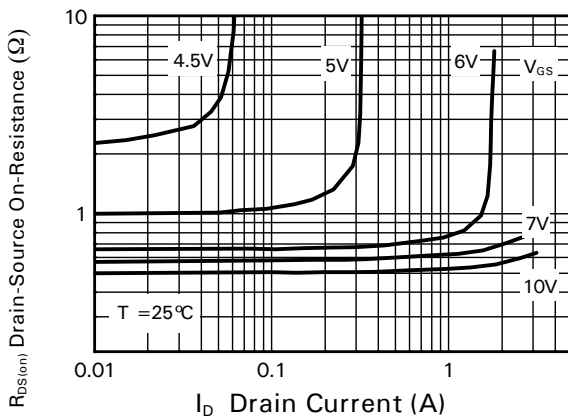
**Output Characteristics**



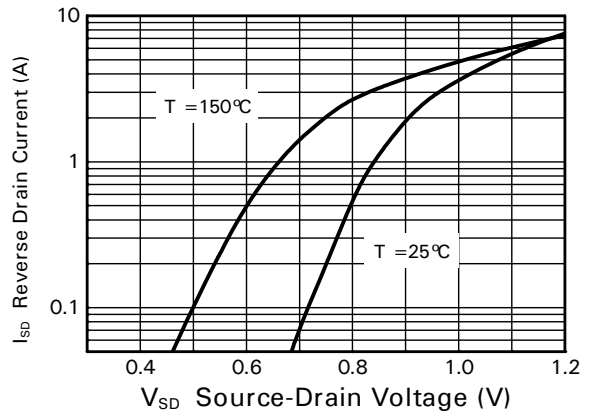
**Typical Transfer Characteristics**



**Normalised Curves v Temperature**

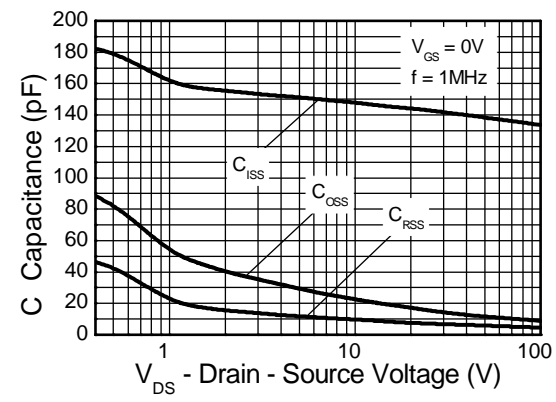


**On-Resistance v Drain Current**

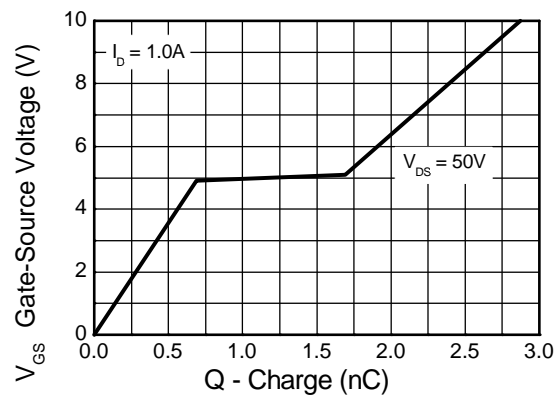


**Source-Drain Diode Forward Voltage**

**Typical Characteristics (cont.)**

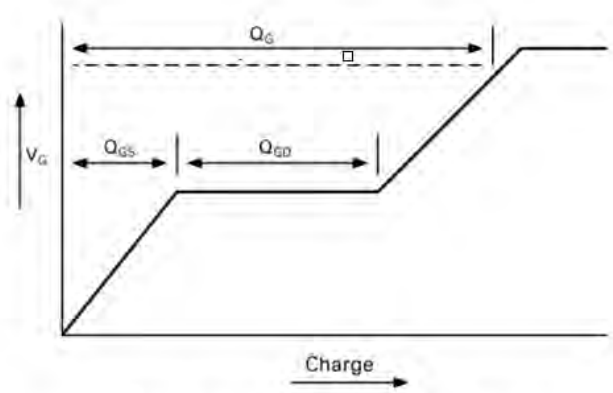


**Capacitance v Drain-Source Voltage**

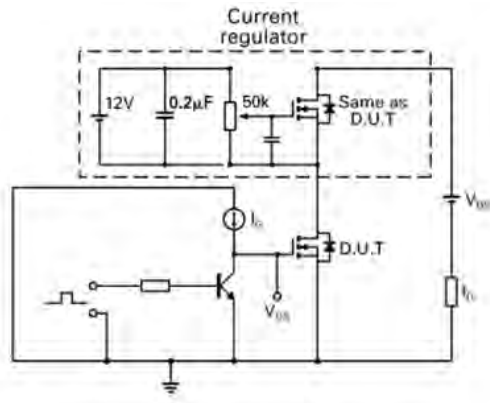


**Gate-Source Voltage v Gate Charge**

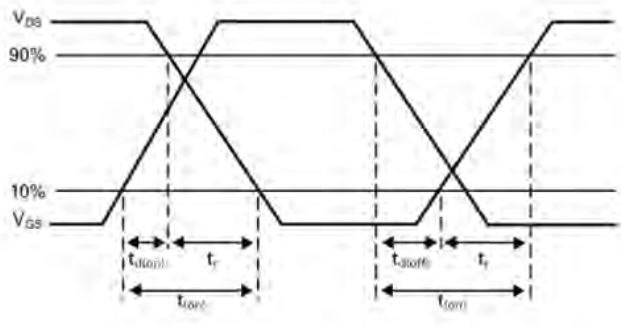
**Test Circuits**



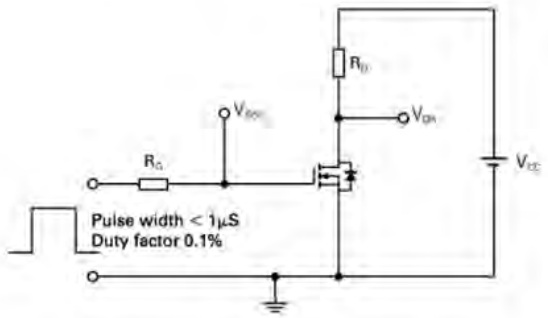
**Basic gate charge waveform**



**Gate charge test circuit**



**Switching time waveforms**

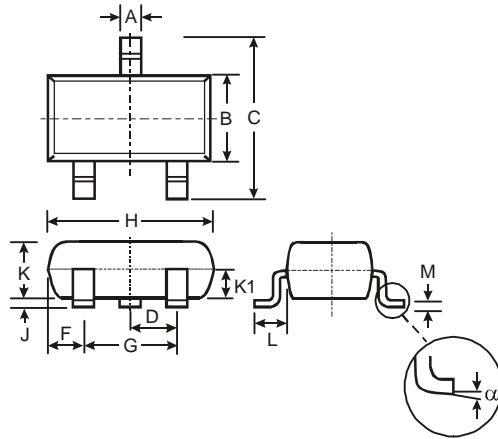


**Switching time test circuit**

**ZXMN10A07F**

### Package Outline Dimensions

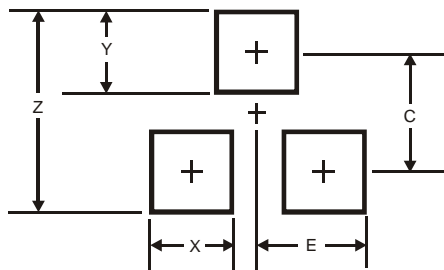
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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