THE ZXMN6A07F IS NOT RECOMMENDED FOR NEW DESIGNS.
PLEASE USE THE DMN6140L.

Lead-free Green

ZXMN6A07F

60V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	Max $R_{DS(ON)}$	Max I_D T_A = +25°C (Note 7)
60V	250mΩ @ V_{GS} = 10V	1.4A
	350mΩ @ V_{GS} = 4.5V	1.2A

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Charge
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**
- **An automotive-compliant part is available under a separate datasheet (ZXMN6A07FQ)**

Description and Applications

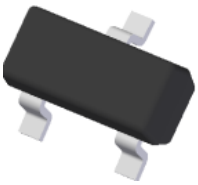
This MOSFET utilizes a unique structure that combines the benefits of low on-resistance with a fast switching speed, making it ideal for high-efficiency power-management applications.

- DC-DC converters
- Power-management functions
- Relay and solenoid driving
- Motor controls

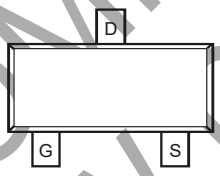
Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (e3)
- Weight: 0.008 grams (Approximate)

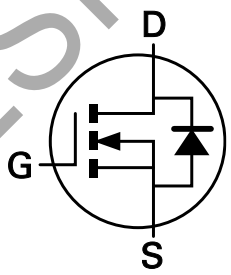
SOT23



Top View



Top View
Pin Out



Equivalent Circuit

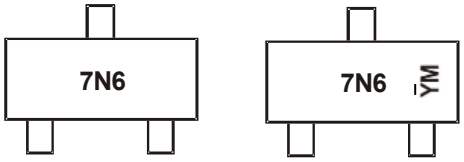
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
ZXMN6A07FTA	SOT23	3,000	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
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

SOT23



7N6 = Product Type Marking Code
$\overline{Y}$M = Date Code Marking
$\overline{Y}$ = Year (ex: N = 2026)
M = Month (ex: 9 = September)

Date Code Key

Year	2010	-	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	X	-	N	P	R	S	T	U	V	W	X	Y

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GS}	±20	V
Continuous Drain Current	V_{GS} = 10V	T_A = +25°C (Note 6) T_A = +70°C (Note 6) T_A = +25°C (Note 5)	I_D	1.4 1.1 1.2	A
Pulsed Drain Current (Note 7)			I_{DM}	6.9	A
Continuous Source Current (Body Diode) (Note 6)			I_S	1	A
Pulsed Source Current (Body Diode) (Note 7)			I_{SM}	6.9	A

Thermal Characteristics

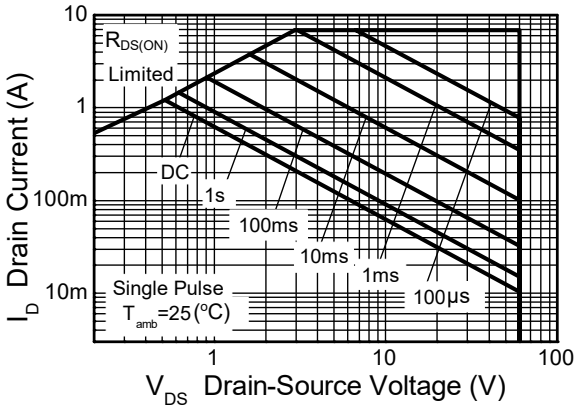
Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor		P_D	625 5	mW mW/°C
Power Dissipation (Note 6) Linear Derating Factor		P_D	806 6.4	mW mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	200	°C/W
	(Note 6)		155	
Thermal Resistance, Junction to Ambient (Note 8)		$R_{\theta JL}$	194	
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 ≤ 5secs.
7. Repetitive rating 25mm x 25mm FR4 PCB, D = 0.02 pulse width = 300µs - pulse current limited by maximum junction temperate.
8. Thermal resistance from junction to solder-point (at the end of the drain lead).

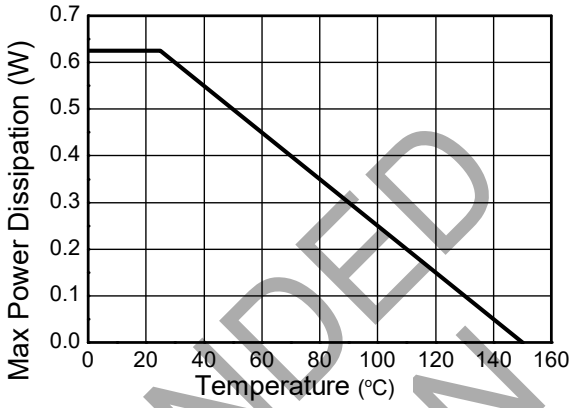
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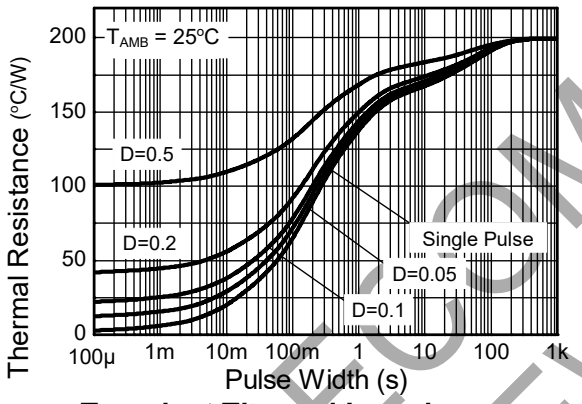
Thermal Characteristics (continued)



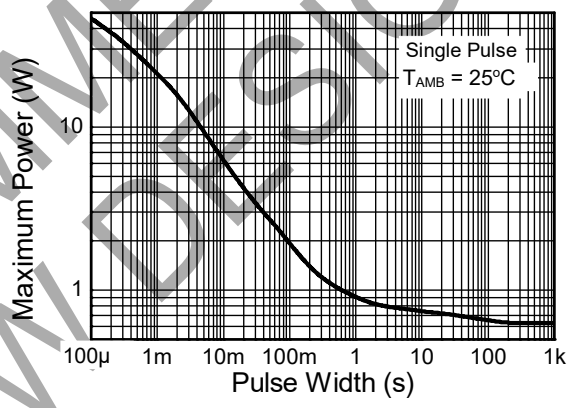
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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

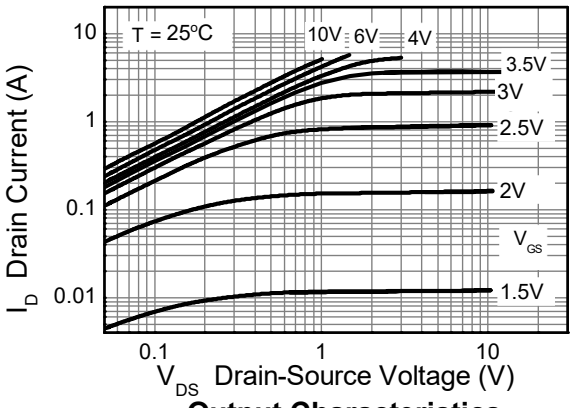
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	I_D = 250μA, V_{GS} = 0
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 60V, V_{GS} = 0
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	—	3.0	V	I_D = 250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 9)	$R_{DS(ON)}$	—	—	0.250	Ω	V_{GS} = 10V, I_D = 1.8A
				0.350		V_{GS} = 4.5V, I_D = 1.3A
Forward Transconductance (Notes 9 and 11)	G_{FS}	—	2.3	—	S	V_{DS} = 15V, I_D = 1.8A
Diode Forward Voltage (Note 9)	V_{SD}	—	0.8	0.95	V	T_J = +25°C, I_S = 0.45A, V_{GS} = 0
Reverse-Recovery Time (Note 11)	t_{RR}	—	20.5	—	ns	T_J = +25°C, I_F = 1.8A, di/dt = 100A/μs
Reverse-Recovery Charge (Note 11)	Q_{RR}	—	21.3	—	nC	
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C_{iss}	—	166	—	pF	V_{DD} = 40V, V_{GS} = 0 f = 1.0MHz
Output Capacitance	C_{oss}	—	19.5	—		
Reverse Transfer Capacitance	C_{rss}	—	8.7	—		
Turn-On Delay Time (Note 10)	$t_{D(ON)}$	—	1.8	—	ns	V_{DD} = 30V, I_D = 1.8A, $R_G \cong 6.0\Omega$, V_{GS} = 10V
Turn-On Rise Time (Note 10)	t_R	—	1.4	—		
Turn-Off Delay Time (Note 10)	$t_{D(OFF)}$	—	4.9	—		
Turn-Off Fall Time (Note 10)	t_F	—	2.0	—		
Total Gate Charge (Note 10)	Q_g	—	1.65	—	nC	V_{DS} = 30V, V_{GS} = 5V, I_D = 1.8A
Total Gate Charge (Note 10)	Q_g	—	3.2	—	nC	V_{DS} = 30V, V_{GS} = 10V, I_D = 1.8A
Gate-Source Charge (Note 10)	Q_{gs}	—	0.67	—		
Gate-Drain Charge (Note 10)	Q_{gd}	—	0.82	—		

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.

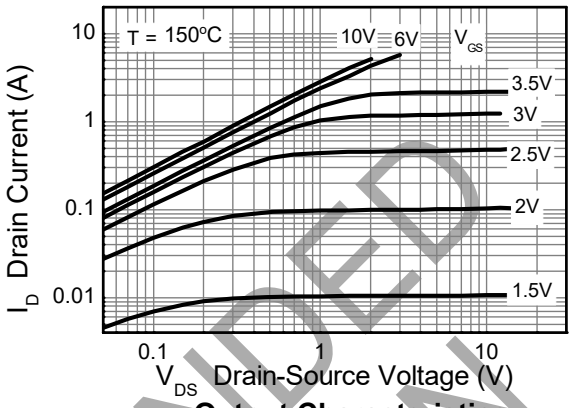
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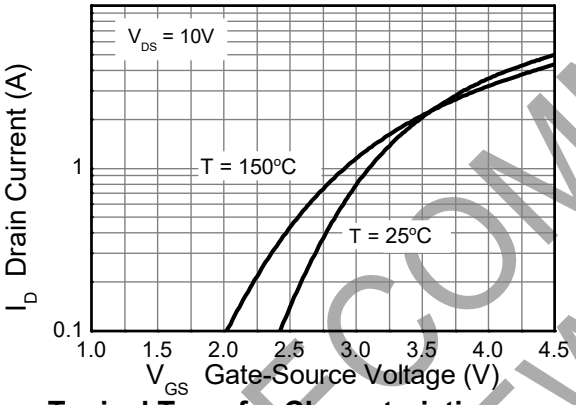
Typical Characteristics



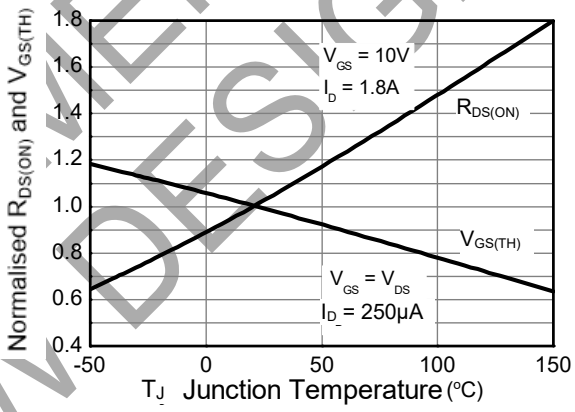
Output Characteristics



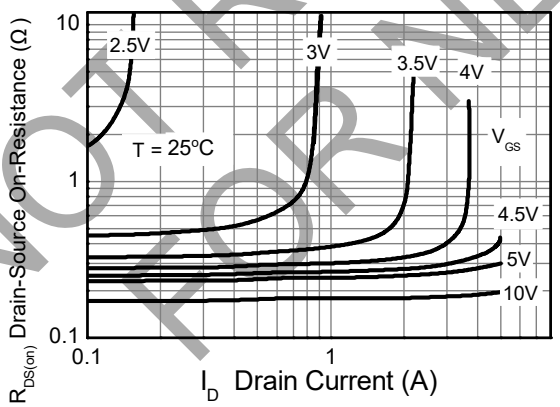
Output Characteristics



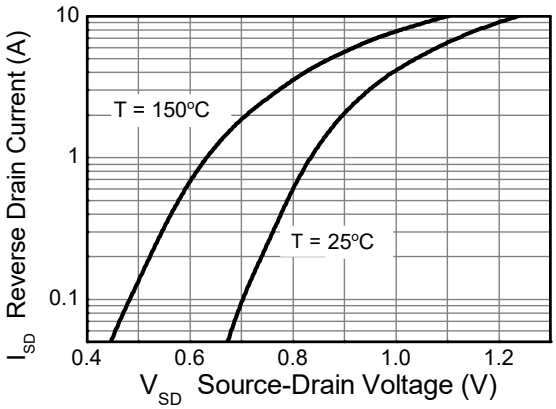
Typical Transfer Characteristics



Normalised Curves v Temperature



On-Resistance v Drain Current

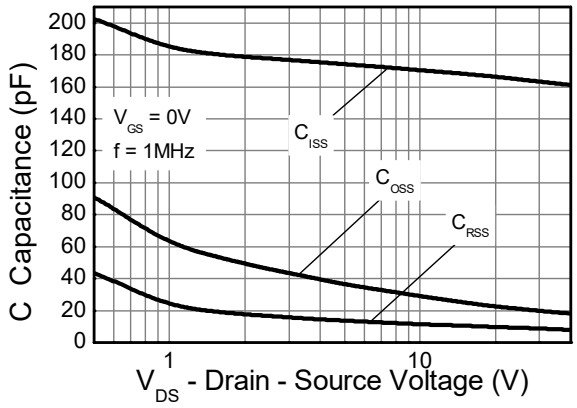


Source-Drain Diode Forward Voltage

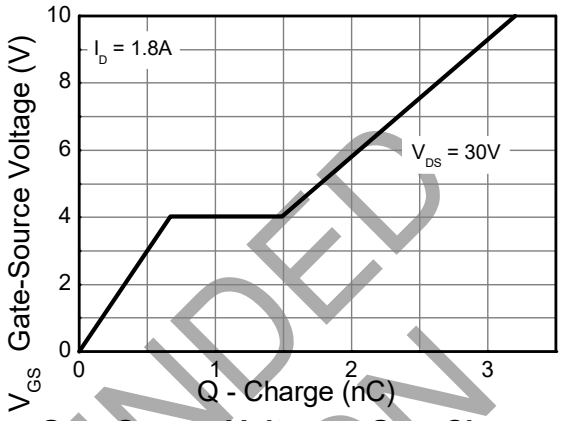
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Typical Characteristics (continued)

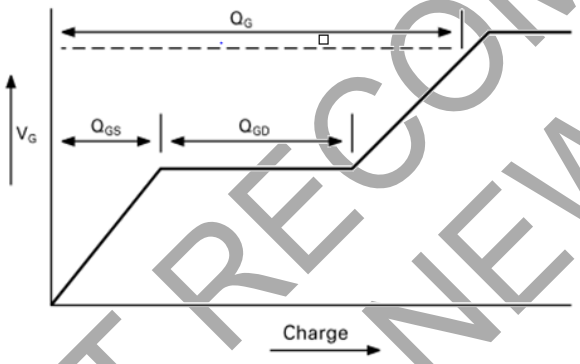


Capacitance v Drain-Source Voltage

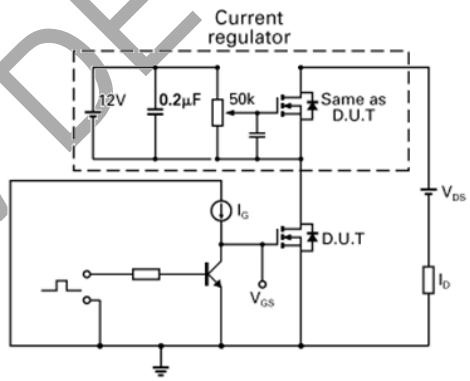


Gate-Source Voltage v Gate Charge

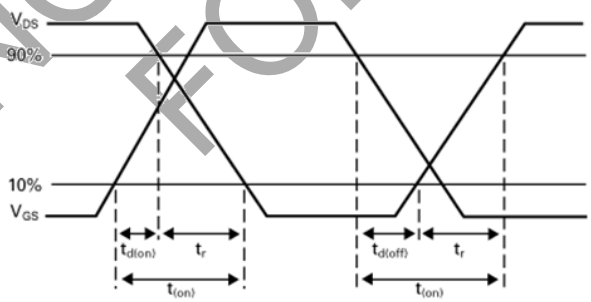
Test Circuits



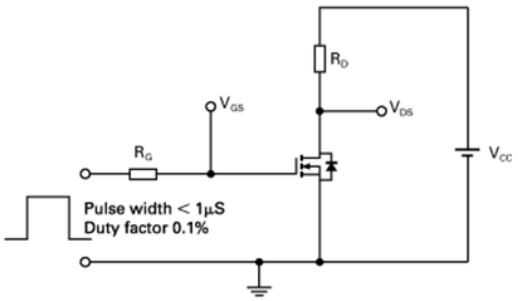
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



Switching time test circuit

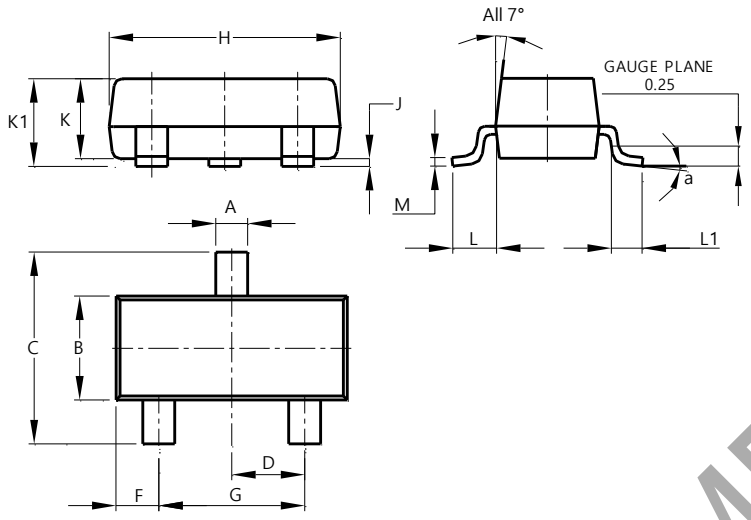
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Package Outline Dimensions

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

SOT23

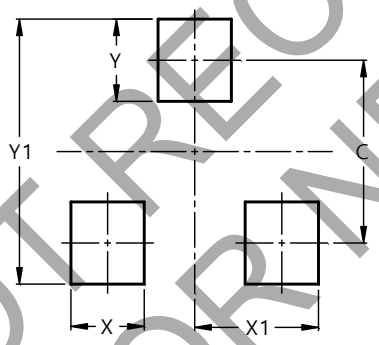


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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