

Product Summary

$V_{(BR)DSS}$	Max $R_{DS(ON)}$	Max I_D $T_A = +25^\circ C$ (Note 7)
60V	250m Ω @ $V_{GS} = 10V$	1.4A
	350m Ω @ $V_{GS} = 4.5V$	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)**
- **The ZXMN6A07FQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is AEC-Q101 qualified, supported by a PPAP and is ideal for use in:

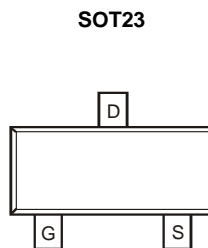
- DC-DC Converters
- Power Management Functions
- Relay And Solenoid Driving
- Motor Control

Mechanical Data

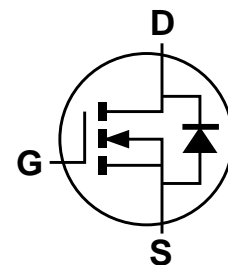
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish E3
- Weight: 0.008 grams (Approximate)



Top View



Top View
Pin Out



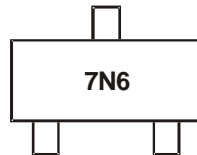
Equivalent Circuit

Ordering Information (Notes 4)

Product	Case	Packaging
ZXMN6A07FQTA	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



7N6 = Product Type Marking Code

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

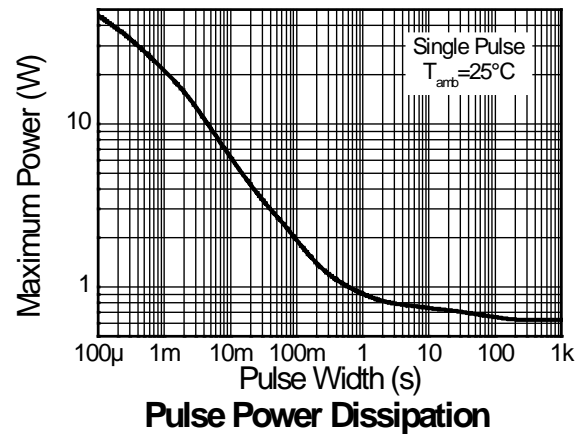
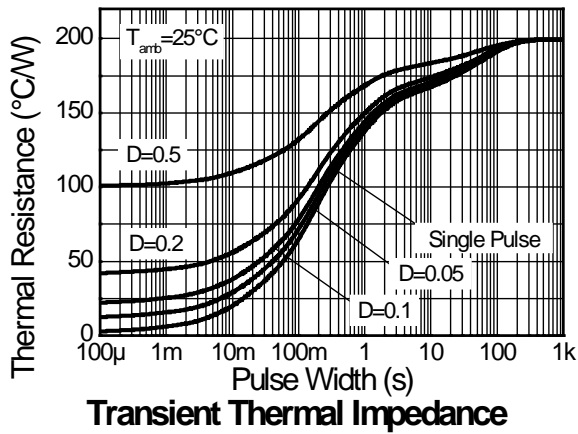
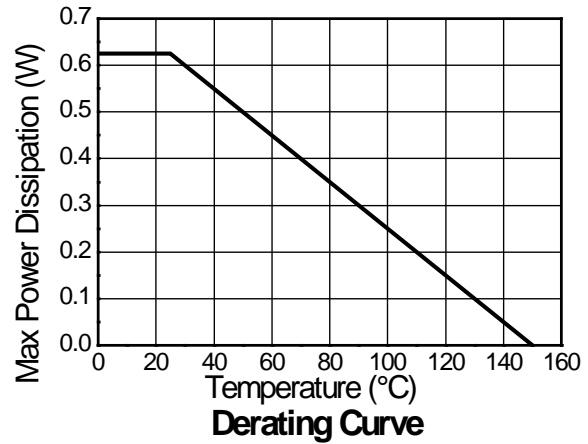
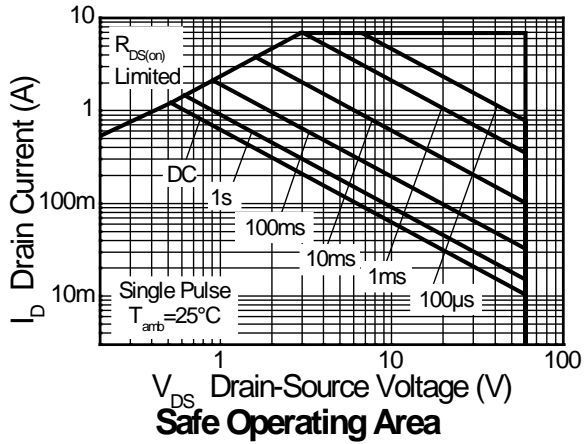
Characteristic			Symbol	Value	Units
Drain-Source Voltage			V _{DSS}	60	V
Gate-Source Voltage			V _{GS}	±20	V
Continuous Drain Current	V _{GS} = 10V	T _A = +25°C (Note 7)	I _D	1.4	A
		T _A = +70°C (Note 7)		1.1	
		T _A = +25°C (Note 6)		1.2	
Pulsed Drain Current (Note 8)			I _{DM}	6.9	A
Continuous Source Current (Body Diode) (Note 7)			I _S	1	A
Pulsed Source Current (Body Diode) (Note 8)			I _{SM}	6.9	A

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 6)		P _D	625	mW
Linear Derating Factor			5	mW/°C
Power Dissipation (Note 7)		P _D	806	mW
Linear Derating Factor			6.4	mW/°C
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	200	°C/W
	(Note 7)		155	
Thermal Resistance, Junction to Ambient (Note 9)		R _{θJL}	194	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
6. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 7. For a device surface mounted on FR4 PCB measured at t ≤ 5 secs.
 8. Repetitive rating 25mm x 25mm FR4 PCB, D=0.02 pulse width=300µs - pulse current limited by maximum junction temperature.
 9. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics (continued)

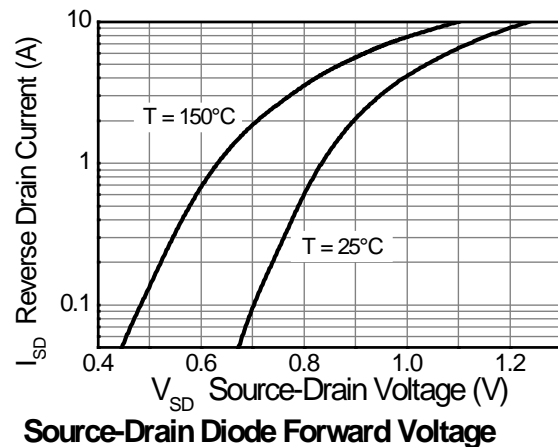
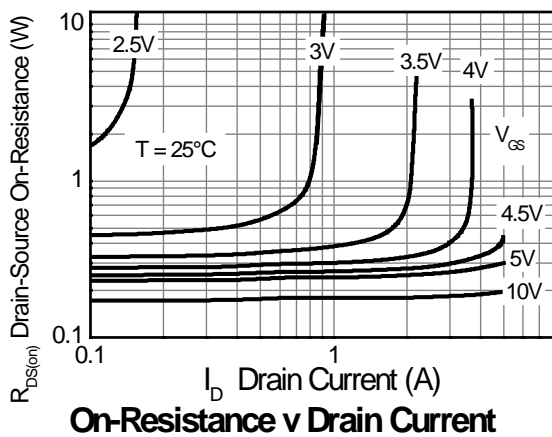
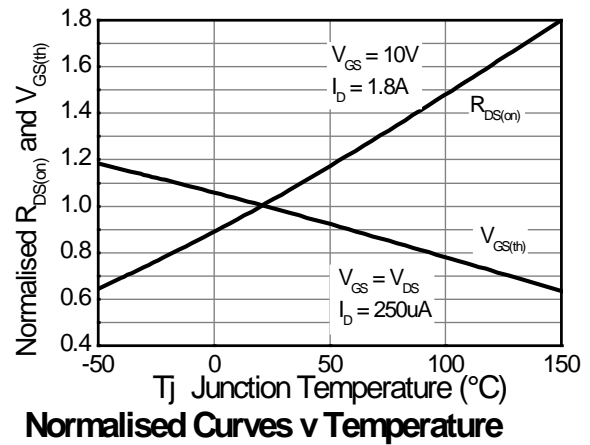
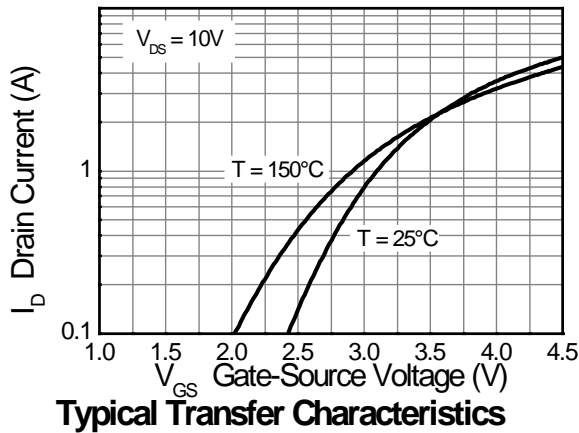
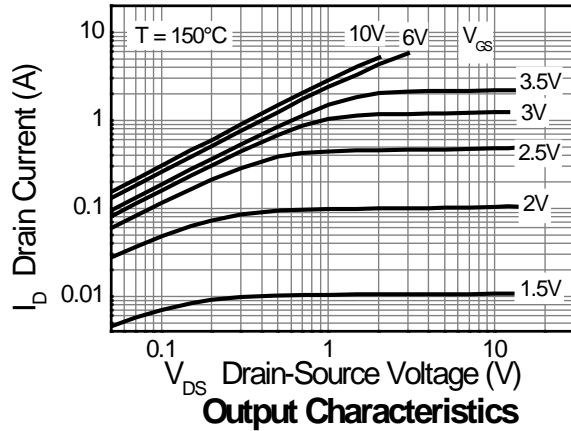
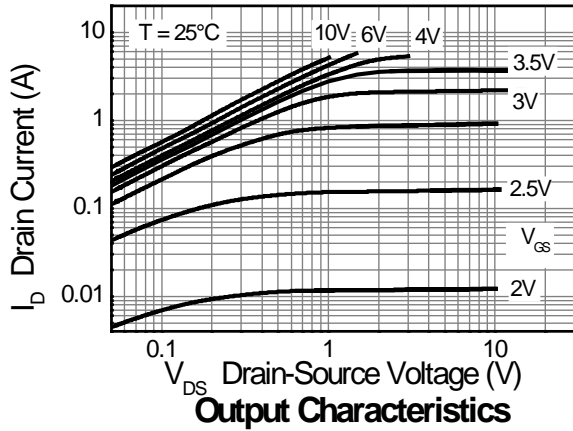


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

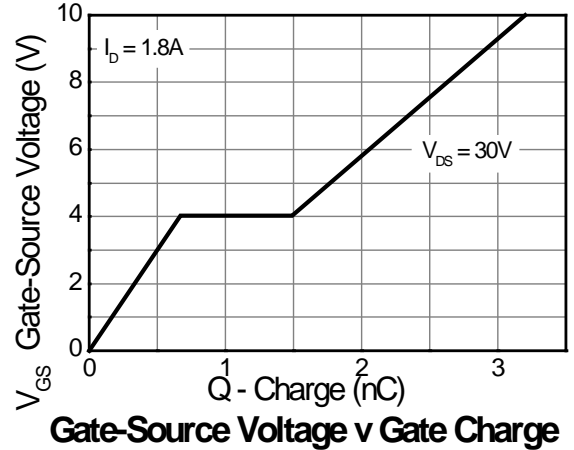
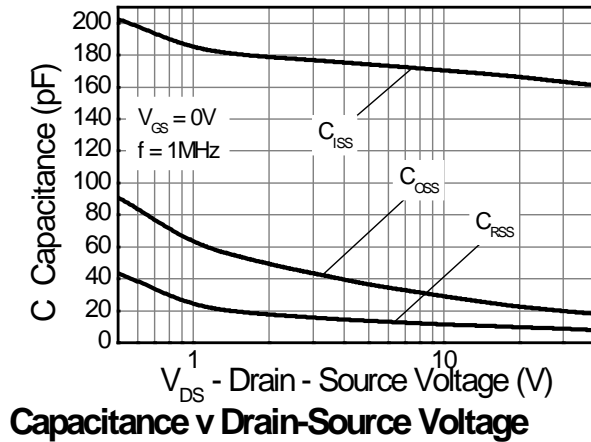
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	3.0	V	$I_D = 250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-Resistance (Note 10)	$R_{DS(on)}$	—	—	0.250	Ω	$V_{GS} = 10\text{V}$, $I_D = 1.8\text{A}$
				0.350		$V_{GS} = 4.5\text{V}$, $I_D = 1.3\text{A}$
Forward Transconductance (Notes 10 and 12)	g_{fs}	—	2.3	—	S	$V_{DS} = 15\text{V}$, $I_D = 1.8\text{A}$
Diode Forward Voltage (Note 10)	V_{SD}	—	0.8	0.95	V	$T_J = +25^\circ\text{C}$, $I_S = 0.45\text{A}$, $V_{GS} = 0\text{V}$
Reverse Recovery Time (Note 12)	t_{rr}	—	20.5	—	ns	$T_J = +25^\circ\text{C}$, $I_F = 1.8\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge (Note 12)	Q_{rr}	—	21.3	—	nC	
DYNAMIC CHARACTERISTICS (Note 12)						
Input Capacitance	C_{iss}	—	166	—	pF	$V_{DD} = 40\text{V}$, $V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	19.5	—		
Reverse Transfer Capacitance	C_{rss}	—	8.7	—		
Turn-On Delay Time (Note 11)	$t_{D(on)}$	—	1.8	—	ns	$V_{DD} = 30\text{V}$, $I_D = 1.8\text{A}$, $R_G \cong 6.0\Omega$, $V_{GS} = 10\text{V}$
Turn-On Rise Time (Note 11)	t_r	—	1.4	—		
Turn-Off Delay Time (Note 11)	$t_{D(off)}$	—	4.9	—		
Turn-Off Fall Time (Note 11)	t_f	—	2.0	—		
Total Gate Charge (Note 11)	Q_g	—	1.65	—	nC	$V_{DS} = 30\text{V}$, $V_{GS} = 5\text{V}$, $I_D = 1.8\text{A}$
Total Gate Charge (Note 11)	Q_g	—	3.2	—	nC	$V_{DS} = 30\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 1.8\text{A}$
Gate-Source Charge (Note 11)	Q_{gs}	—	0.67	—		
Gate-Drain Charge (Note 11)	Q_{gd}	—	0.82	—		

- Notes:
- 10. Measured under pulsed conditions. Pulse width = $300\mu\text{s}$. Duty cycle $\leq 2\%$.
 - 11. Switching characteristics are independent of operating junction temperature.
 - 12. For design aid only, not subject to production testing.

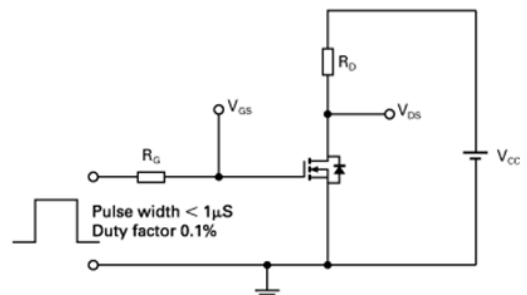
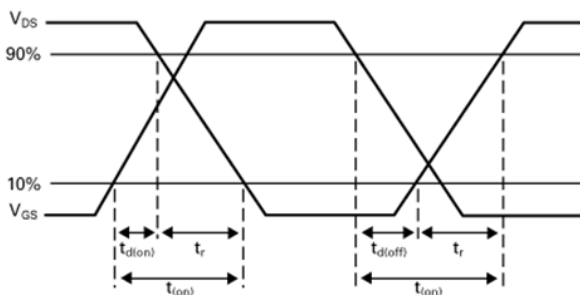
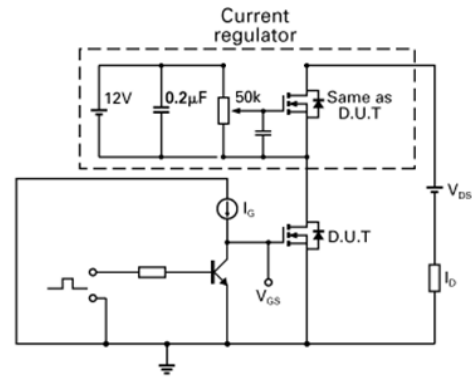
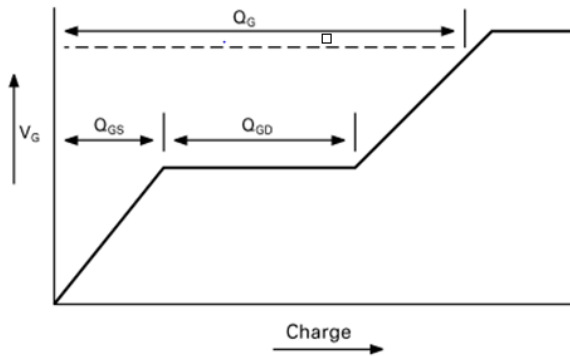
Typical Characteristics



Typical Characteristics (continued)

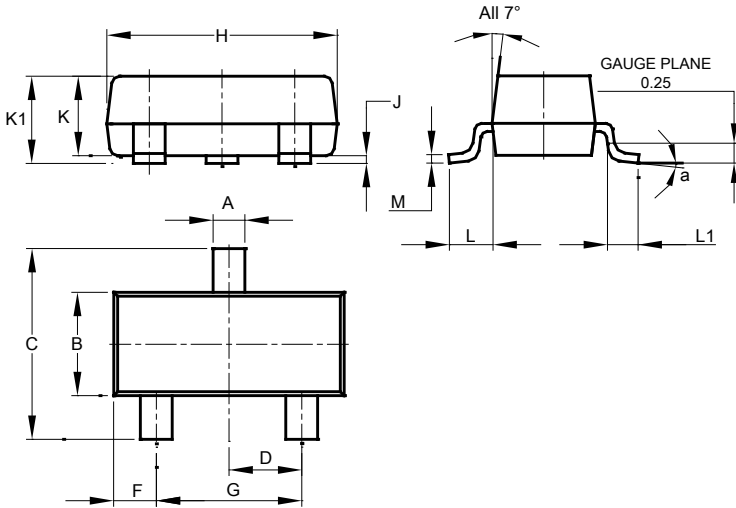


Test Circuits



Package Outline Dimensions

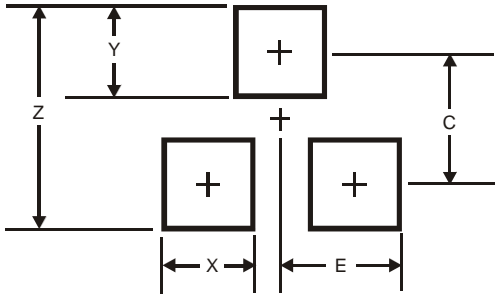
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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	0.890	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	8°		
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> 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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