ZXMN6A08E6

60V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D T_A = +25°C
60V	80mΩ @ V_{GS}=10V	3.5A
	150mΩ @ V_{GS}=4.5V	2.5A

Description

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

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

Features and Benefits

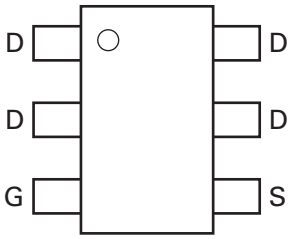
- Low On-Resistance
- Fast Switching Speed
- Low Gate Drive
- Low Threshold
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

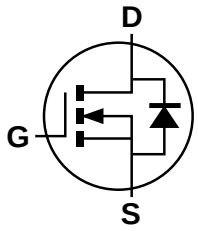
- Case: SOT26
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.018 grams (approximate)

SOT23-6

Top View



Pin Out - Top View



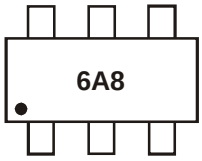
Equivalent Circuit

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN6A08E6TA	See below	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/quality/lead_free.html 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/products/packages.html.

Marking Information



6A8 = Product Type Marking Code

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

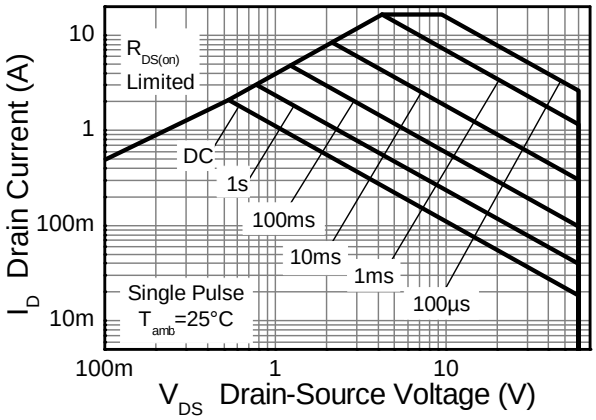
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GS}	±20	V
Continuous Drain Current	V_{GS} = 10V	(Note 6)	I_D	3.5	A
		T_A = +70°C (Note 6)		2.8	
		(Note 5)		2.8	
Pulsed Drain Current	V_{GS}= 10V	(Note 7)	I_{DM}	16	A
Continuous Source Current (Body diode)		(Note 6)	I_S	2.6	A
Pulsed Source Current (Body diode)		(Note 7)	I_{SM}	16	A

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

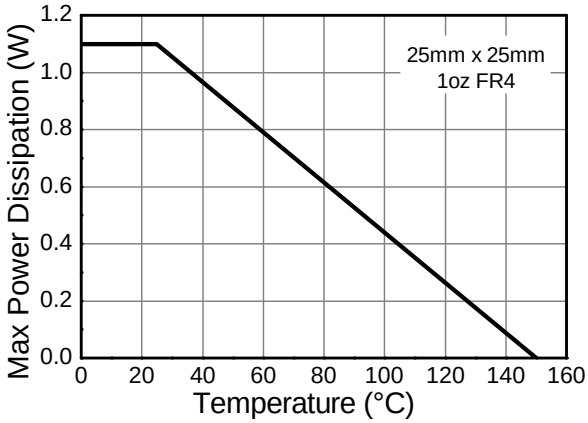
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1.1	W
Linear Derating Factor			8.8	mW/°C
	(Note 6)		1.7	W
			13.6	mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	113	°C/W
	(Note 6)		73	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Notes:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
6. Same as note (5), except the device is measured at t ≤ 10 sec.
7. Same as note (5), except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.

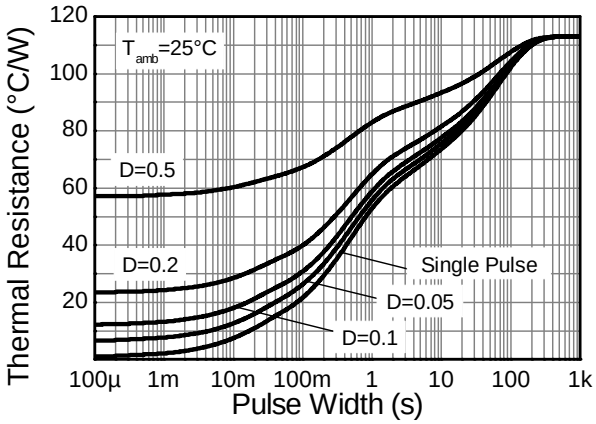
Thermal Characteristics



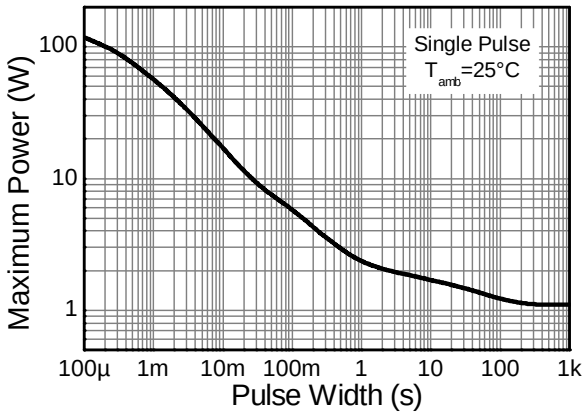
Safe Operating Area



Derating Curve



Transient Thermal Impedance



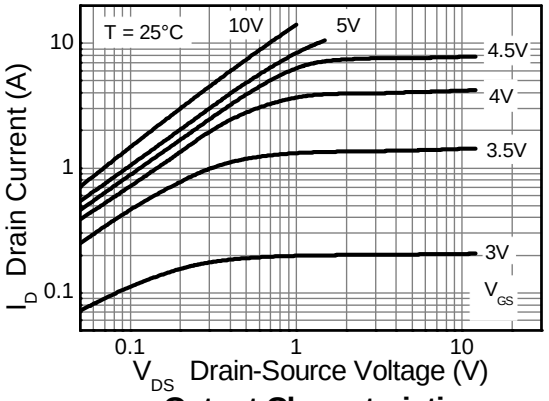
Pulse Power Dissipation

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

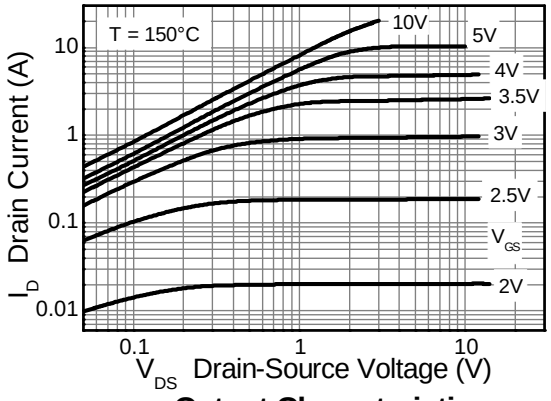
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	I_D = 250µA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	µA	V_{DS} = 60V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	—	V	I_D = 250µA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	0.067	0.080	Ω	V_{GS} = 10V, I_D = 4.8A
			0.100	0.150		V_{GS} = 4.5V, I_D = 4.2A
Forward Transconductance (Notes 8 & 9)	g_{fs}	—	6.6	—	S	V_{DS} = 15V, I_D = 4.8A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.88	1.2	V	I_S = 4A, V_{GS} = 0V, T_J = +25°C
Reverse recovery time (Note 9)	t_{rr}	—	19.2	—	ns	I_F = 1.4A, di/dt = 100A/µs, T_J = +25°C
Reverse recovery charge (Note 9)	Q_{rr}	—	30.3	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	459	—	pF	V_{DS} = 40V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	44.2	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	24.1	—	pF	
Total Gate Charge (Note 10)	Q_g	—	3.7	—	nC	V_{GS} = 4.5V; V_{DS} = 30V, I_D = 1.4A
Total Gate Charge (Note 10)	Q_g	—	5.8	—	nC	V_{GS} = 10V; V_{DS} = 30V, I_D = 1.4A
Gate-Source Charge (Note 10)	Q_{gs}	—	1.4	—	nC	
Gate-Drain Charge (Note 10)	Q_{gd}	—	1.9	—	nC	
Turn-On Delay Time (Note 10)	$t_{D(on)}$	—	2.6	—	ns	V_{DD} = 30V, V_{GS} = 10V, I_D = 1.5A, $R_G \cong 6.0\Omega$
Turn-On Rise Time (Note 10)	t_r	—	2.1	—	ns	
Turn-Off Delay Time (Note 10)	$t_{D(off)}$	—	12.3	—	ns	
Turn-Off Fall Time (Note 10)	t_f	—	4.6	—	ns	

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

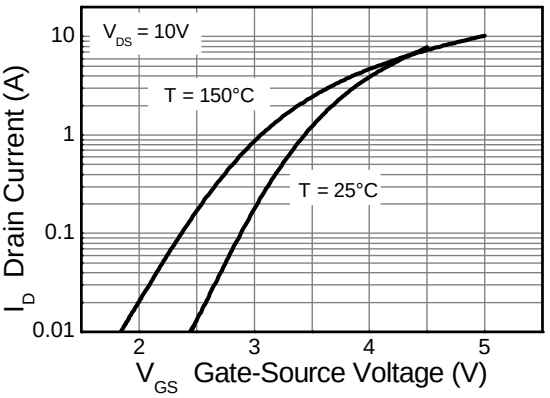
Typical Characteristics



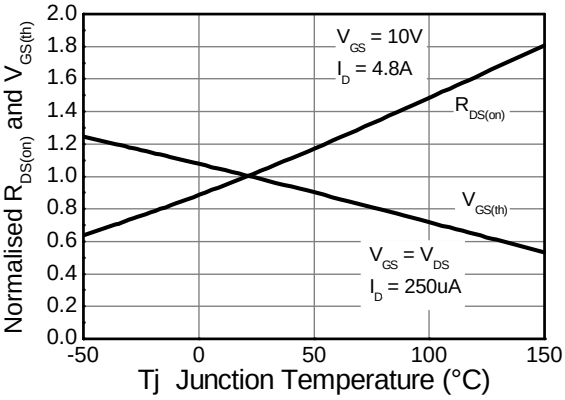
Output Characteristics



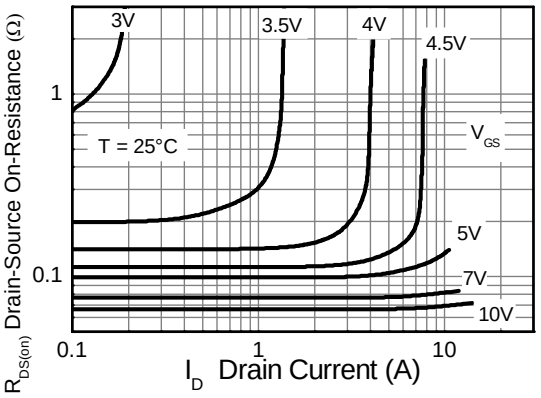
Output Characteristics



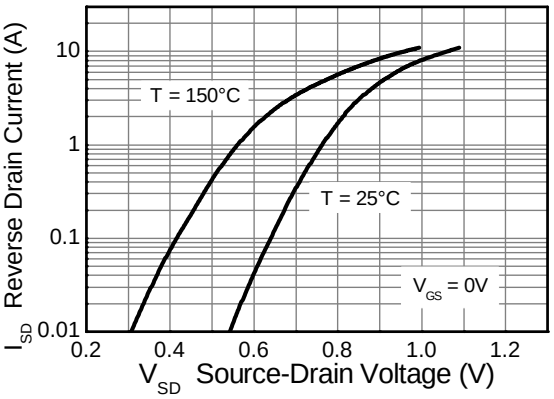
Typical Transfer Characteristics



Normalised Curves v Temperature

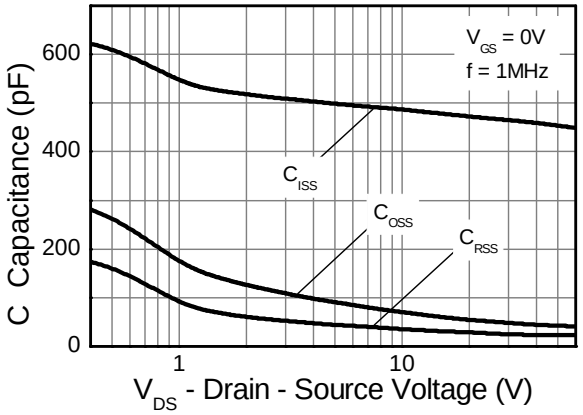


On-Resistance v Drain Current

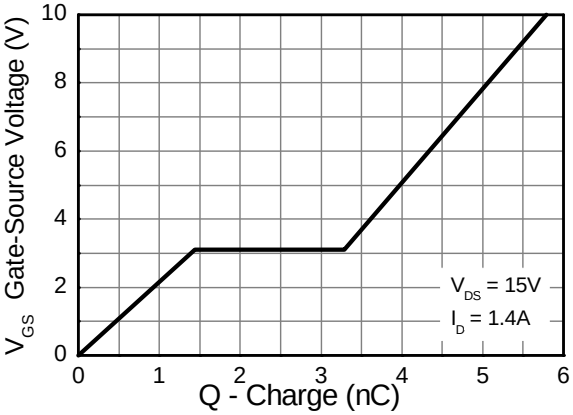


Source-Drain Diode Forward Voltage

Typical Characteristics (cont.)

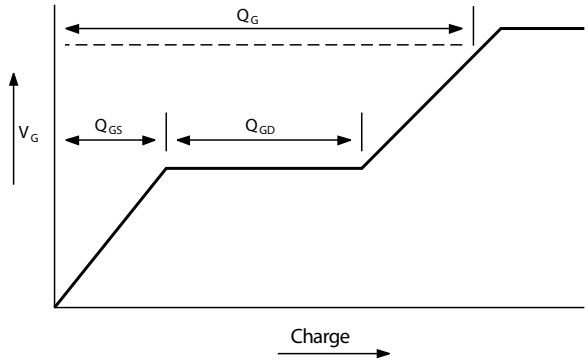


Capacitance v Drain-Source Voltage

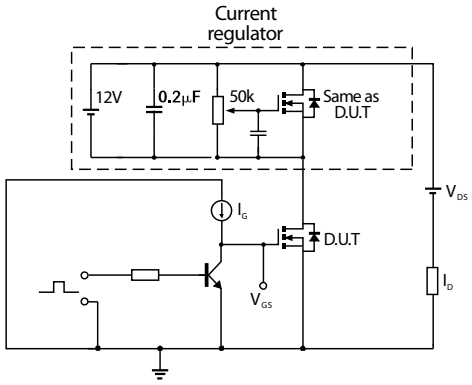


Gate-Source Voltage v Gate Charge

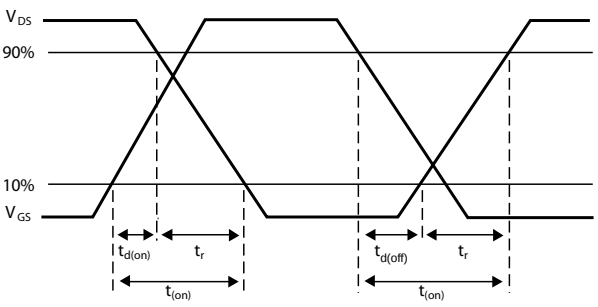
Test Circuits



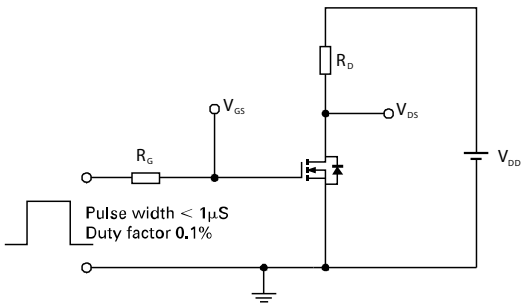
Basic gate charge waveform



Gate charge test circuit



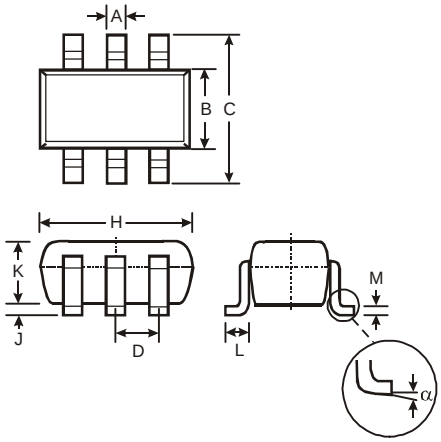
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

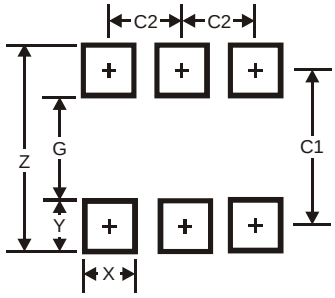
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT26			
Dim	**Min**	**Max**	**Typ**
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
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	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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