



**ZXMN6A08E6**

## 60V N-CHANNEL ENHANCEMENT MODE MOSFET

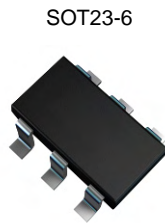
### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = 25^\circ C$
100V	80m $\Omega$ @ $V_{GS}=10V$	3.5A
	150m $\Omega$ @ $V_{GS}=4.5V$	2.5A

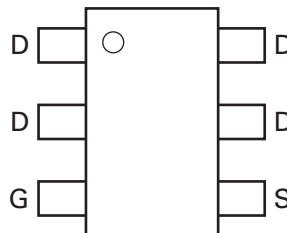
### Description and Applications

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.

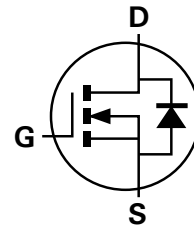
- DC-DC Converters
- Power management functions
- Disconnect switches
- Motor control



Top View



Pin Out - Top View



Equivalent Circuit

### Features and Benefits

- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- **“Green” component and RoHS compliant (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

### Mechanical Data

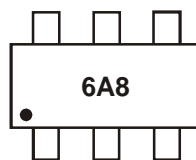
- Case: SOT23-6
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.018 grams (approximate)

### Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN6A08E6TA	See below	7	8	3,000

Notes: 1. Diodes, Inc. defines “Green” products as those which are RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.’s “Green” Policy can be found on our website. For packaging details, go to our website.

### Marking Information



6A8 = Product Type Marking Code

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

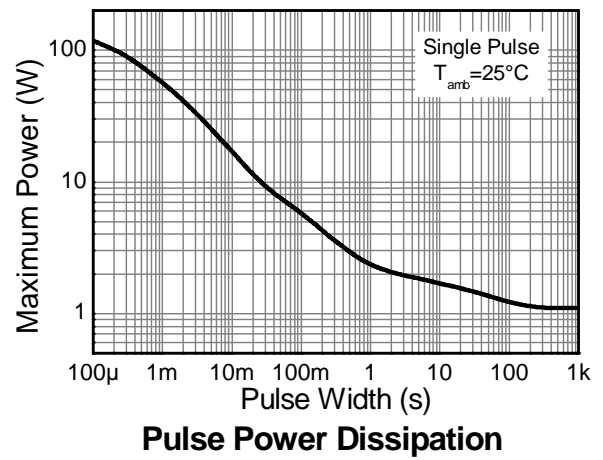
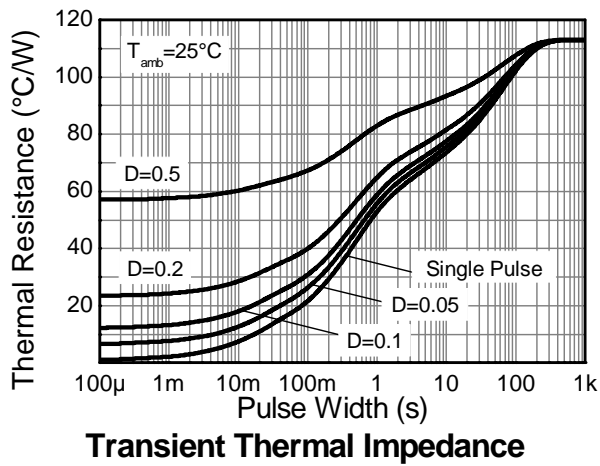
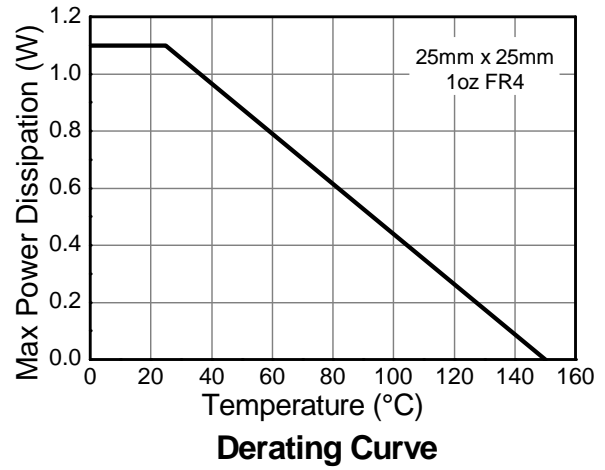
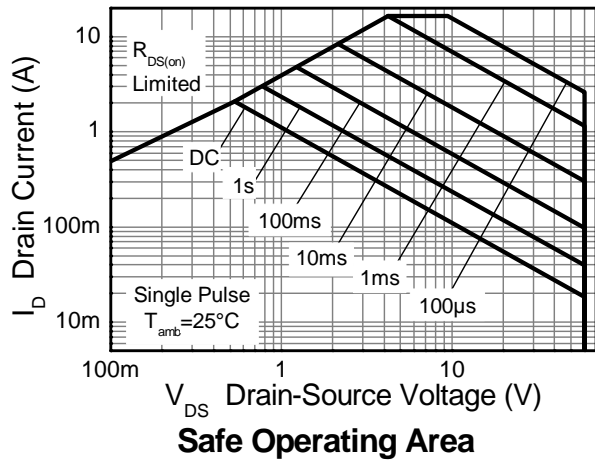
Characteristic			Symbol	Value	Unit	
Drain-Source voltage			$V_{DSS}$	60	V	
Gate-Source voltage			$V_{GS}$	$\pm 20$	V	
Continuous Drain current	$V_{GS} = 10\text{V}$	(Note 3)	$I_D$	3.5	A	
		$T_A = 70^\circ\text{C}$ (Note 3)		2.8		
		(Note 2)		2.8		
Pulsed Drain current	$V_{GS} = 10\text{V}$	(Note 4)	$I_{DM}$	16	A	
Continuous Source current (Body diode)			(Note 3)	$I_S$	2.6	A
Pulsed Source current (Body diode)			(Note 4)	$I_{SM}$	16	A

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic			Symbol	Value	Unit
Power dissipation Linear derating factor		(Note 2)	$P_D$	1.1	W mW/ $^\circ\text{C}$
				8.8	
		(Note 3)		1.7	
Thermal Resistance, Junction to Ambient		(Note 1)	$R_{\theta JA}$	113	$^\circ\text{C}/\text{W}$
		(Note 3)		73	
Operating and storage temperature range			$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

- Notes:
2. 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.
  3. Same as note (2), except the device is measured at  $t \leq 10$  sec.
  4. Same as note (2), except the device is pulsed with  $D = 0.02$  and pulse width 300 $\mu\text{s}$ . The pulse current is limited by the maximum junction temperature.

**Thermal Characteristics**

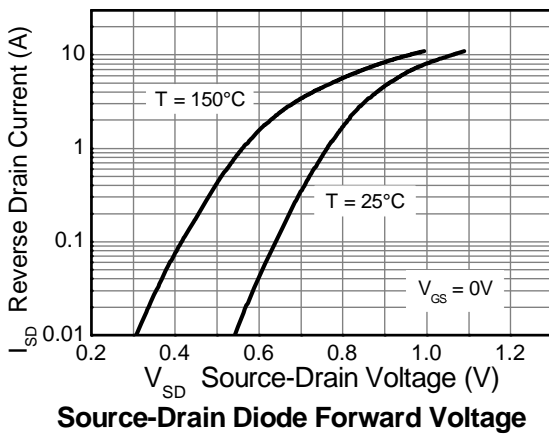
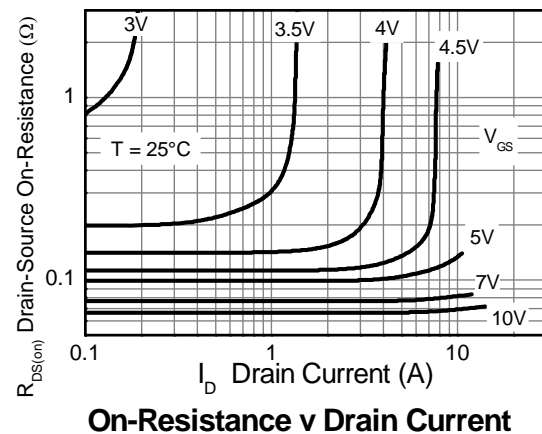
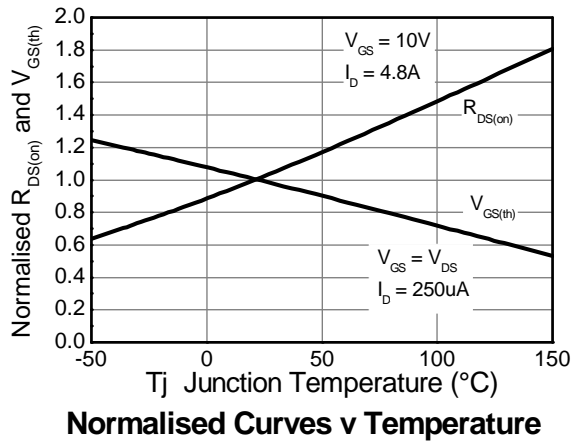
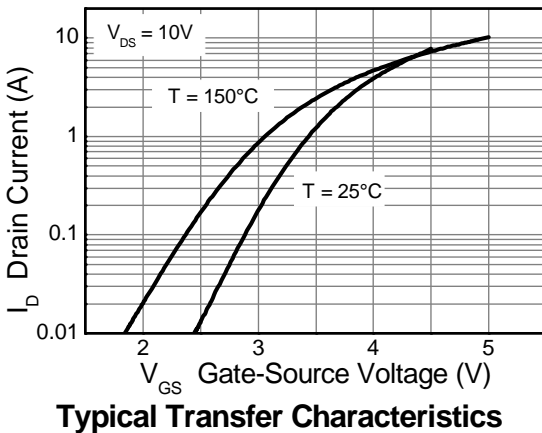
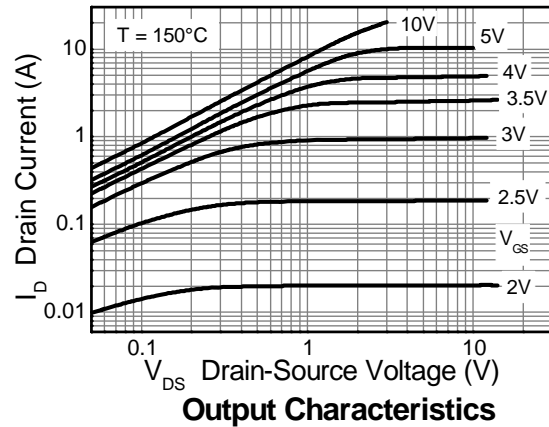
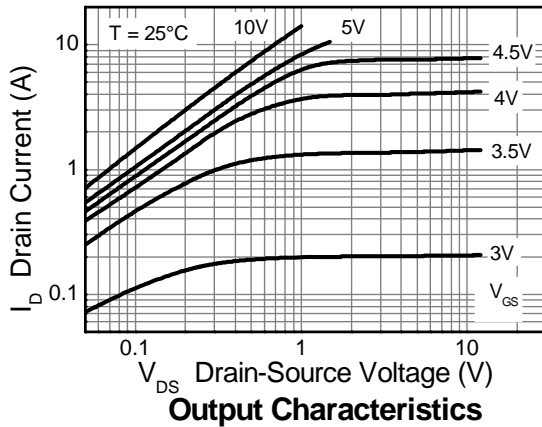


**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

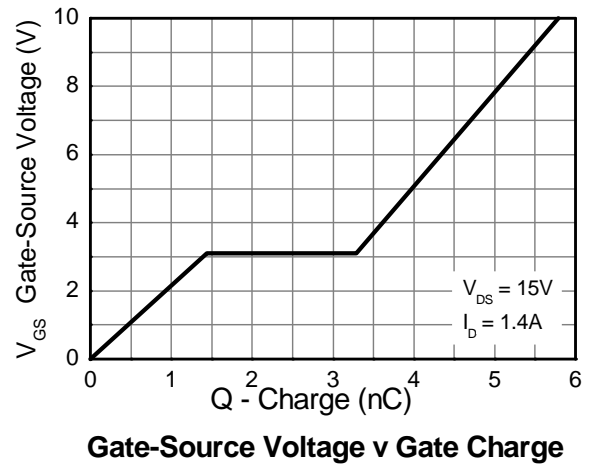
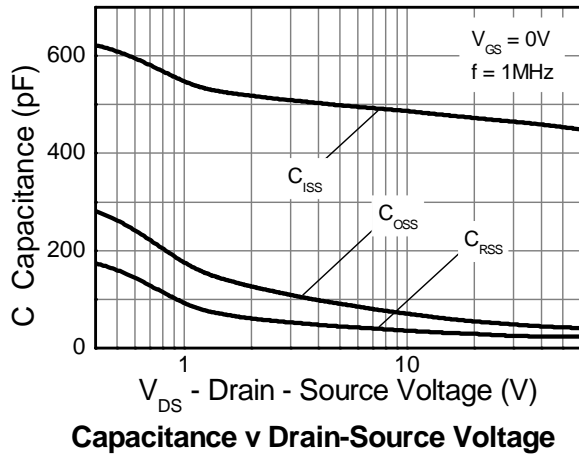
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source 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>	1.0	—	—	V	I <sub>D</sub> = 250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 5)	R <sub>DS(on)</sub>	—	0.067	0.080	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4.8A
			0.100	0.150		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.2A
Forward Transconductance (Notes 5 & 6)	g <sub>fs</sub>	—	6.6	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 4.8A
Diode Forward Voltage (Note 5)	V <sub>SD</sub>	—	0.88	1.2	V	I <sub>S</sub> = 4A, V <sub>GS</sub> = 0V, T <sub>J</sub> = 25°C
Reverse recovery time (Note 6)	t <sub>rr</sub>	—	19.2	—	ns	I <sub>F</sub> = 1.4A, di/dt = 100A/μs,
Reverse recovery charge (Note 6)	Q <sub>rr</sub>	—	30.3	—	nC	T <sub>J</sub> = 25°C
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	C <sub>iss</sub>	—	459	—	pF	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	44.2	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	24.1	—	pF	
Total Gate Charge (Note 7)	Q <sub>g</sub>	—	3.7	—	nC	V <sub>GS</sub> = 4.5V
Total Gate Charge (Note 7)	Q <sub>g</sub>	—	5.8	—	nC	V <sub>GS</sub> = 10V
Gate-Source Charge (Note 7)	Q <sub>gs</sub>	—	1.4	—	nC	
Gate-Drain Charge (Note 7)	Q <sub>gd</sub>	—	1.9	—	nC	
Turn-On Delay Time (Note 7)	t <sub>D(on)</sub>	—	2.6	—	ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V I <sub>D</sub> = 1.5A, R <sub>G</sub> ≅ 6.0Ω
Turn-On Rise Time (Note 7)	t <sub>r</sub>	—	2.1	—	ns	
Turn-Off Delay Time (Note 7)	t <sub>D(off)</sub>	—	12.3	—	ns	
Turn-Off Fall Time (Note 7)	t <sub>f</sub>	—	4.6	—	ns	

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

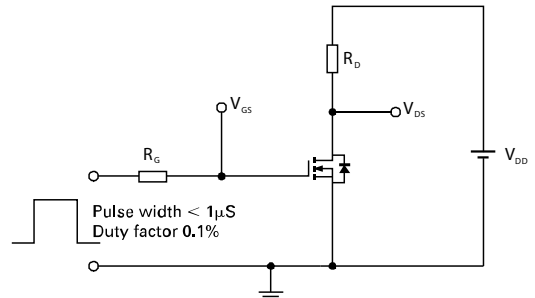
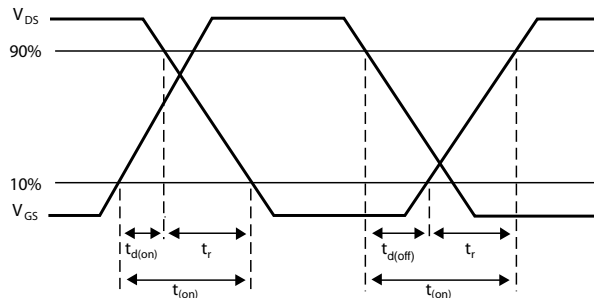
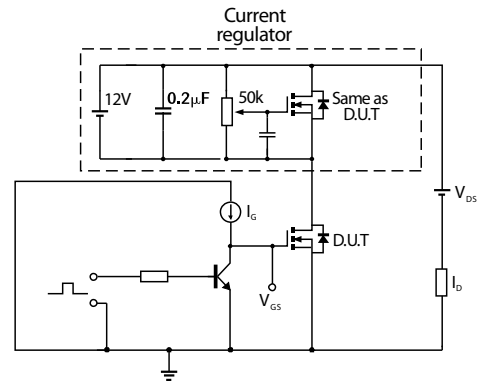
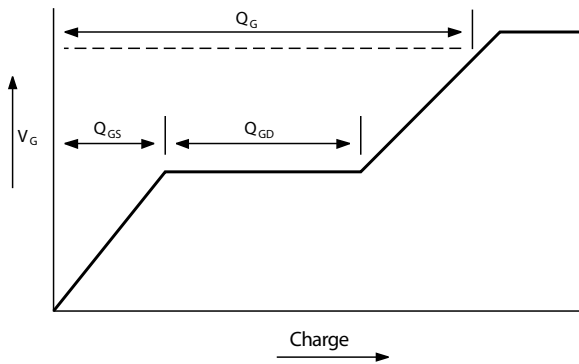
**Typical Characteristics**



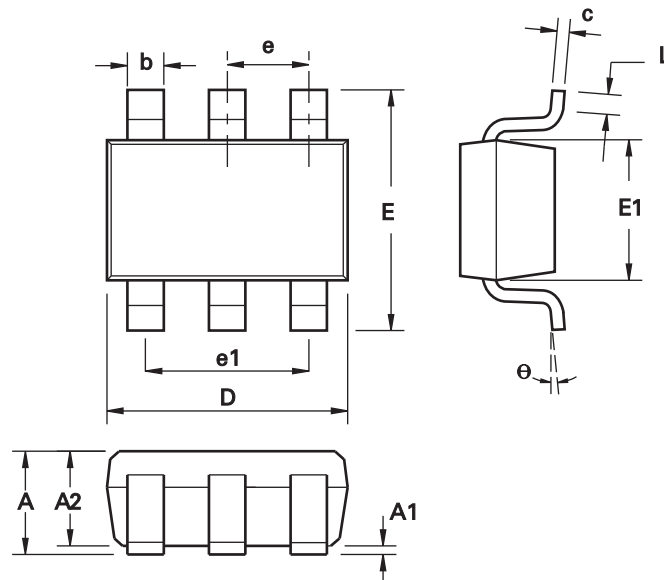
**Typical Characteristics – continued**



**Test Circuits**

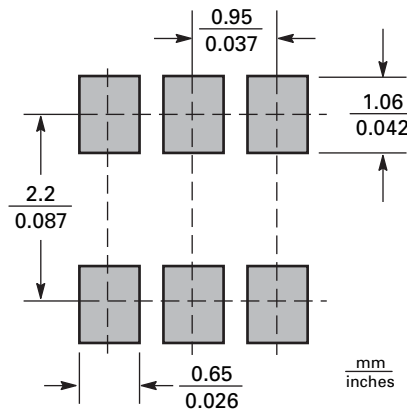


**Package Outline Dimensions**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.354	0.0570
A1	0.00	0.15	0.00	0.0059
A2	0.90	1.30	0.0354	0.0511
b	0.20	0.50	0.0078	0.0196
C	0.09	0.26	0.0035	0.0102
D	2.70	3.10	0.1062	0.1220
E	2.20	3.20	0.0866	0.1181
E1	1.30	1.80	0.0511	0.0708
L	0.10	0.60	0.0039	0.0236
e	0.95 REF		0.0374 REF	
e1	1.90 REF		0.0748 REF	
θ	0°	30°	0°	30°

**Suggested Pad Layout**



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