

**ZXMN10A08E6**

**100V N-CHANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = 25^\circ C$
100V	0.25Ω	1.9A

**Description and Applications**

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

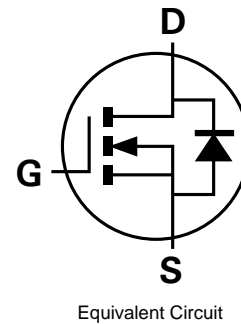
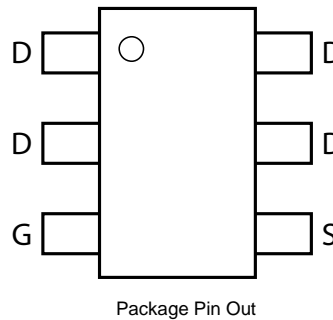
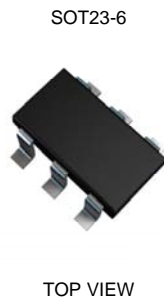
- DC-DC Converters
- Power management functions
- Disconnect Switches
- Motor control

**Features and Benefits**

- Low on-resistance
- Fast switching speed
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

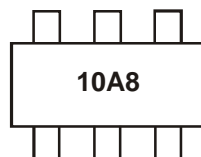
- Case: SOT23-6
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.015 grams (approximate)



**Ordering Information**

Product	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN10A08E6TA	7	8	3,000
ZXMN10A08E6TC	13	8	10,000

**Marking Information**



10A8 = Product Type Marking Code

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

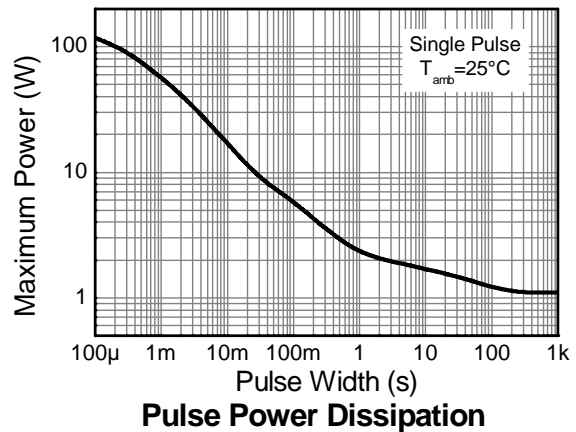
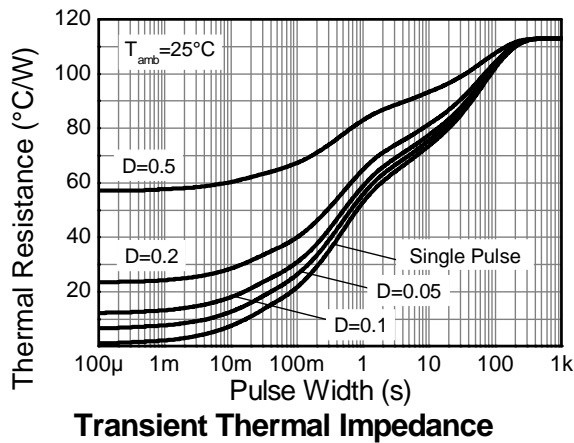
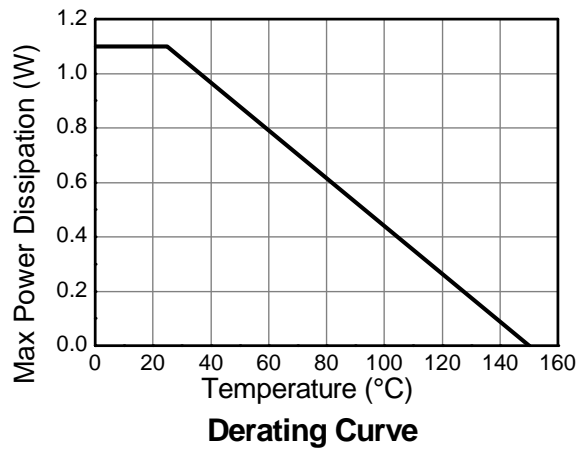
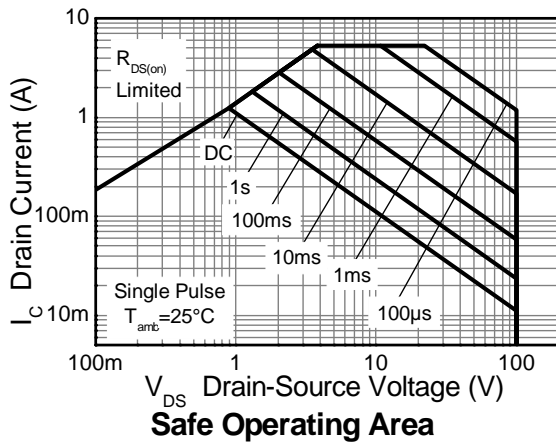
Characteristic		Symbol	Value	Unit
Drain-Source voltage		$V_{DSS}$	100	V
Gate-Source voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain current	$V_{GS} = 10\text{V}$	$I_D$	(Note 2)	1.9
			$T_A = 70^\circ\text{C}$ (Note 2)	1.5
			(Note 1)	1.5
Pulsed Drain current (Note 3)		$I_{DM}$	8.6	A
Continuous Source current (Body diode) (Note 2)		$I_S$	2.5	A
Pulsed Source current (Body diode) (Note 3)		$I_{SM}$	8.6	A

**Thermal Characteristics**

Characteristic		Symbol	Value	Unit
Power dissipation	(Note 1)	$P_D$	1.1	W
Linear derating factor	(Note 1)		8.8	mW/ $^\circ\text{C}$
Power dissipation	(Note 2)	$P_D$	1.7	W
Linear derating factor	(Note 2)		13.6	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to ambient	(Note 1)	$R_{\theta JA}$	113	$^\circ\text{C}/\text{W}$
	(Note 2)		73	$^\circ\text{C}/\text{W}$
Operating and storage temperature range		$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

- Notes:
1. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
  2. For a device surface mounted on FR4 PCB measured at  $t \leq 5$  sec.
  3. Repetitive rating 25mm x 25mm FR4 PCB,  $D = 0.02$ , pulse current 300 $\mu\text{s}$  - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph

**Thermal Characteristics**

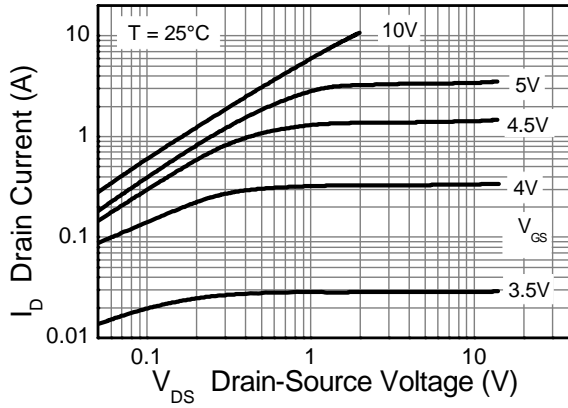


**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

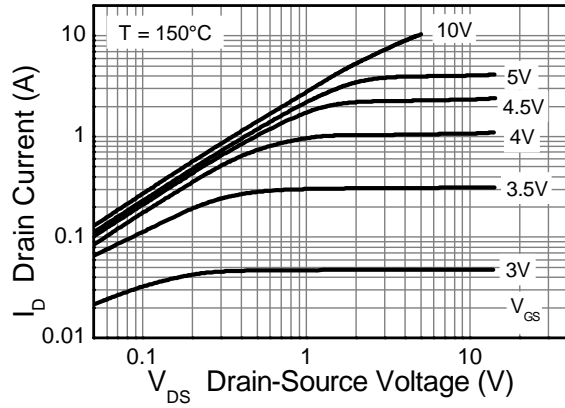
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	100	—	—	V	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V
Gate-Source 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	I <sub>D</sub> = 250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 4)	R <sub>DS(on)</sub>	—	—	0.25 0.30	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.2A V <sub>GS</sub> = 6V, I <sub>D</sub> = 2.6A
Forward Transconductance (Notes 4 & 6)	g <sub>fs</sub>	—	5.0	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 3.2A
Diode Forward Voltage (Note 4)	V <sub>SD</sub>	—	0.87	0.95	V	I <sub>S</sub> = 3.2A, V <sub>GS</sub> = 0V
Reverse recovery time (Note 6)	t <sub>rr</sub>	—	27	—	ns	I <sub>F</sub> = 1.2A, di/dt = 100A/μs
Reverse recovery charge (Note 6)	Q <sub>rr</sub>	—	32	—	nC	
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	C <sub>iss</sub>	—	405	—	pF	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	28.2	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	14.2	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	4.2	—	nC	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 5V I <sub>D</sub> = 1.2A
Total Gate Charge	Q <sub>g</sub>	—	7.7	—	nC	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V I <sub>D</sub> = 1.2A
Gate-Source Charge	Q <sub>gs</sub>	—	1.8	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	2.1	—	nC	
Turn-On Delay Time (Note 5)	t <sub>D(on)</sub>	—	3.4	—	ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V I <sub>D</sub> = 1.2A, R <sub>G</sub> ≅ 6.0Ω
Turn-On Rise Time (Note 5)	t <sub>r</sub>	—	2.2	—	ns	
Turn-Off Delay Time (Note 5)	t <sub>D(off)</sub>	—	8	—	ns	
Turn-Off Fall Time (Note 5)	t <sub>f</sub>	—	3.2	—	ns	

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

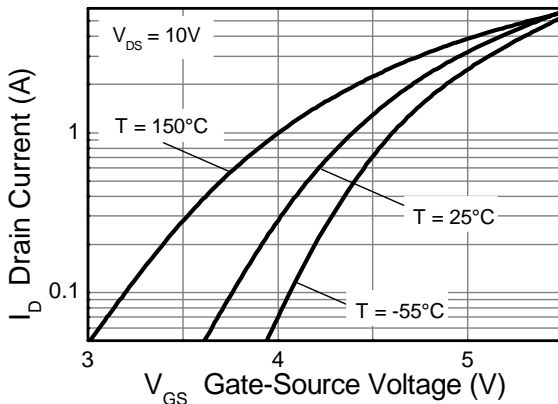
**Typical Characteristics**



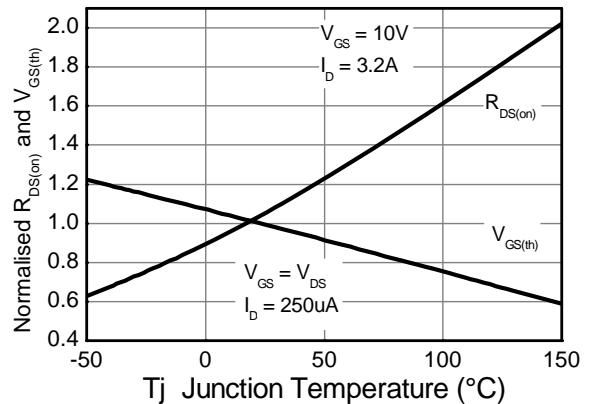
**Output Characteristics**



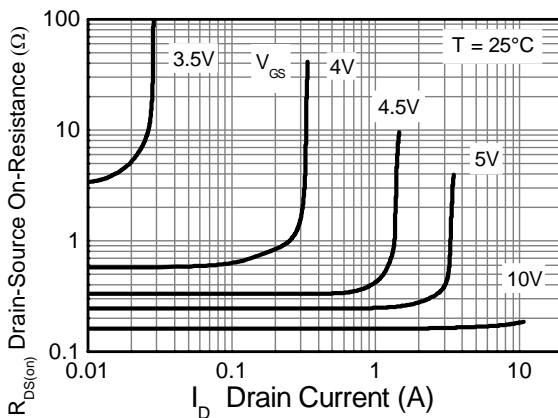
**Output Characteristics**



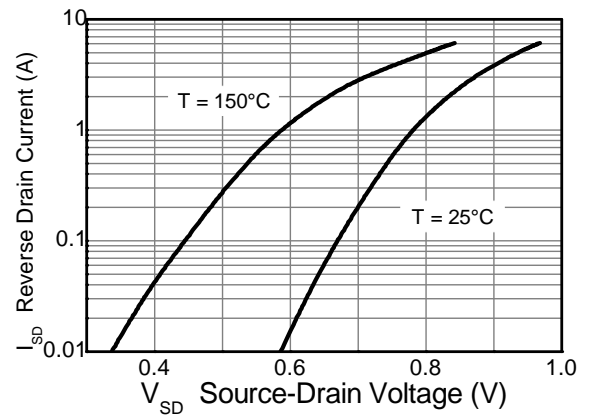
**Typical Transfer Characteristics**



**Normalised Curves v Temperature**

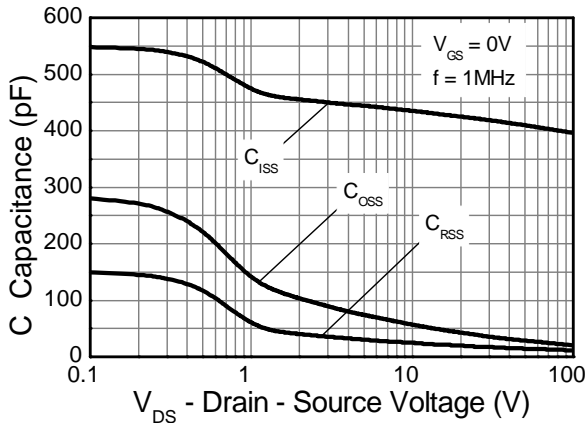


**On-Resistance v Drain Current**

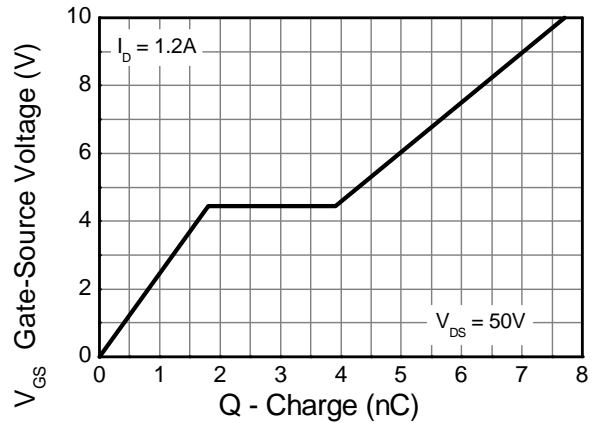


**Source-Drain Diode Forward Voltage**

**Typical Characteristics - continued**

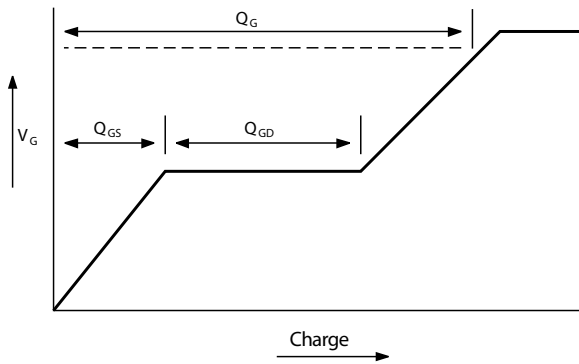


**Capacitance v Drain-Source Voltage**

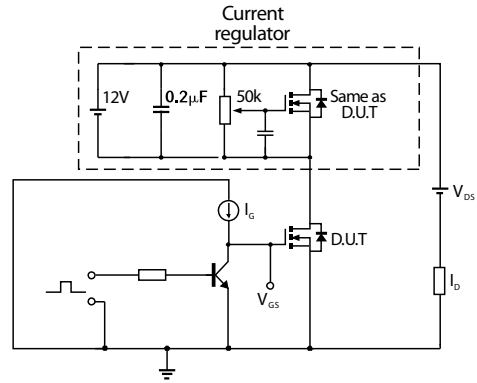


**Gate-Source Voltage v Gate Charge**

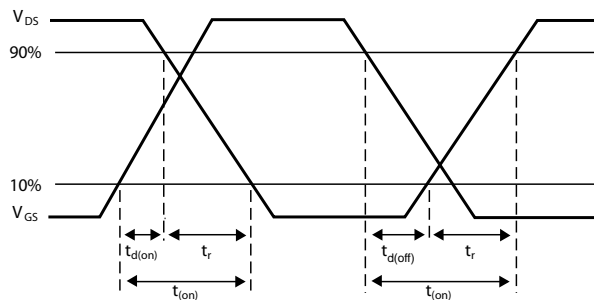
**Test Circuits**



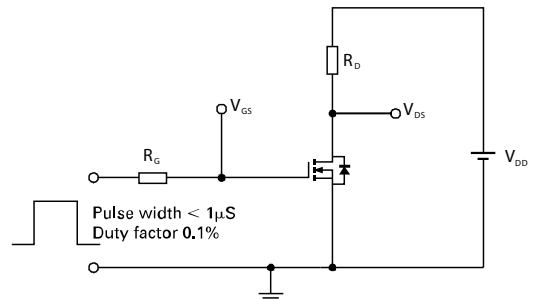
**Basic gate charge waveform**



**Gate charge test circuit**



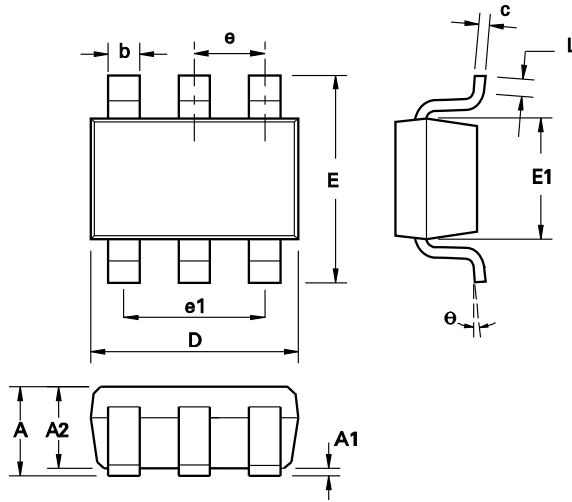
**Switching time waveforms**



**Switching time test circuit**

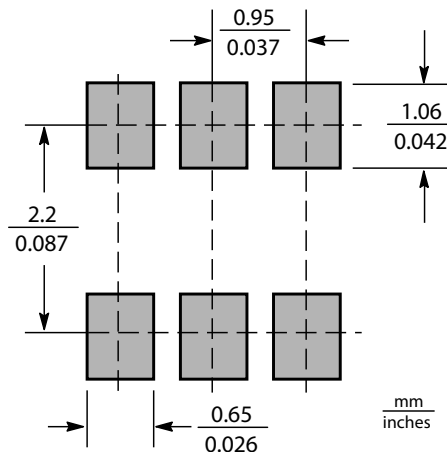
**ZXMN10A08E6**

**Package Outline Dimensions**



DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.45	0.35	0.057
A1	0.00	0.15	0	0.006
A2	0.90	1.30	0.035	0.051
b	0.35	0.50	0.014	0.019
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
L	0.10	0.60	0.004	0.002
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.074 REF	
L	0°	10°	0°	10°

**Suggested Pad Layout**



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