

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

**Product Summary**

$V_{(BR)DSS}$	Max $R_{DS(on)}$	Max $I_D$ $T_A = 25^\circ C$ (Note 5)
100V	250m $\Omega$ @ $V_{GS} = 10V$	1.9A
	300m $\Omega$ @ $V_{GS} = 6V$	1.68A

**Description and Applications**

This new generation trench MOSFET from Zetex features a unique structure combining the benefits of low on-resistance and fast switching, making 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
- **Totally Lead-Free & Fully RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

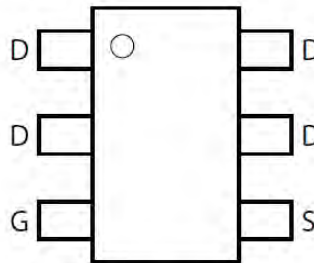
**Mechanical Data**

- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.015 grams (approximate)

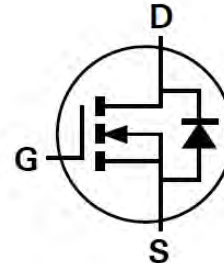
SOT26



Top View



Pinout Top-view



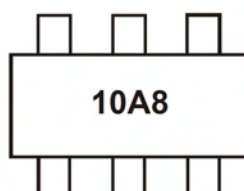
Device symbol

**Ordering Information** (Note 3)

Part Number	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZXMN10A08E6TA	7	8	3000
ZXMN10A08E6TC	13	8	10,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  3. For packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**



10A8 = Product Type Marking Code

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

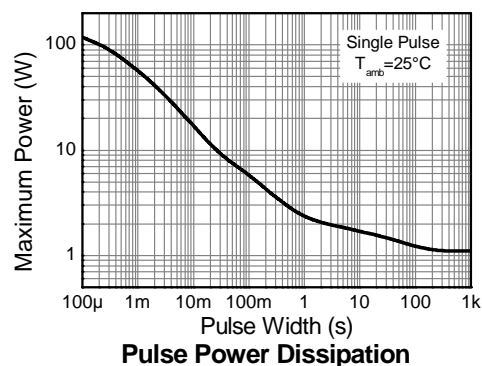
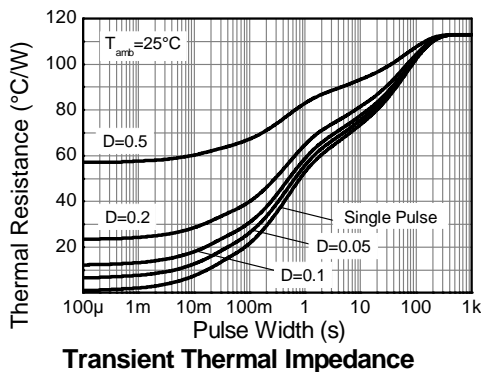
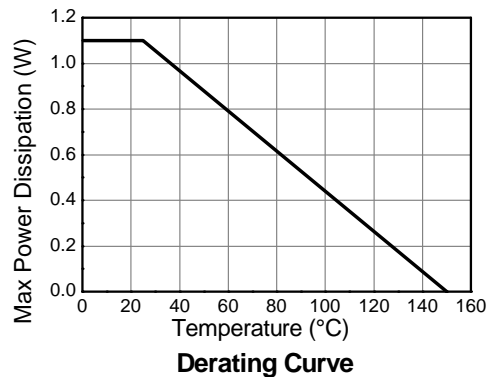
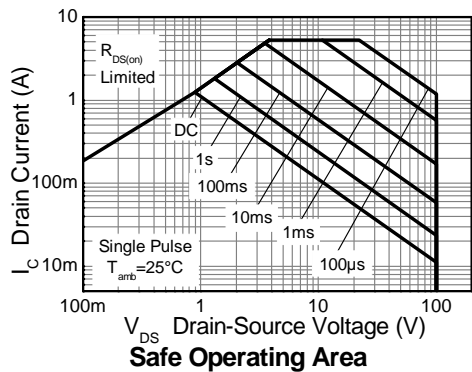
Characteristic		Symbol	Value	Unit	
Drain-Source voltage		$V_{DS}$	100	V	
Gate-Source voltage		$V_{GS}$	$\pm 20$	V	
Continuous Drain current	$V_{GS} = 10\text{V}$	$I_D$	Note 5)	1.9	A
			$T_A = 70^\circ\text{C}$ (Note 5)	1.5	
			(Note 4)	1.5	
			(Note 7)	3.5	
Pulsed Drain current		$I_{DM}$	8.6	A	
Continuous Source Current (Body Diode)		$I_S$	2.5	A	
Pulsed Source Current (Body Diode)		$I_{SM}$	8.6	A	

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 4)	$P_D$	1.1	W
	(Note 5)		1.7	
	(Note 7)		6.3	
Thermal Resistance, Junction to Ambient	(Note 4)	$R_{\theta JA}$	114	$^\circ\text{C/W}$
	(Note 5)		73.5	
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	19.7	$^\circ\text{C/W}$
Operating and Storage Temperature Range		$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

**Thermal Characteristics**

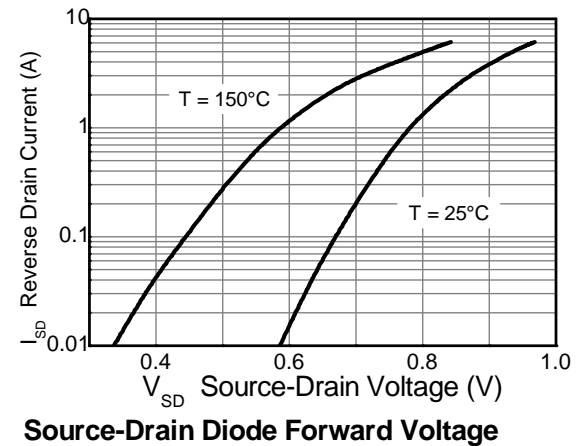
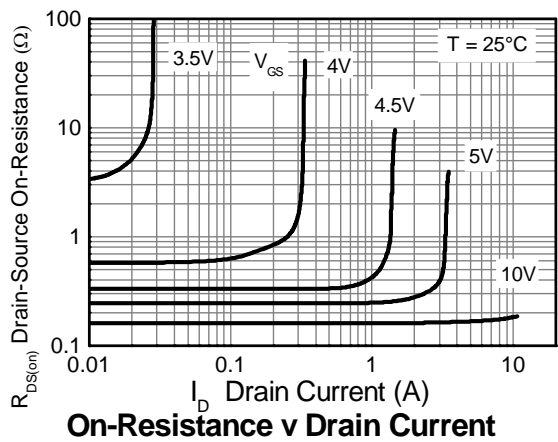
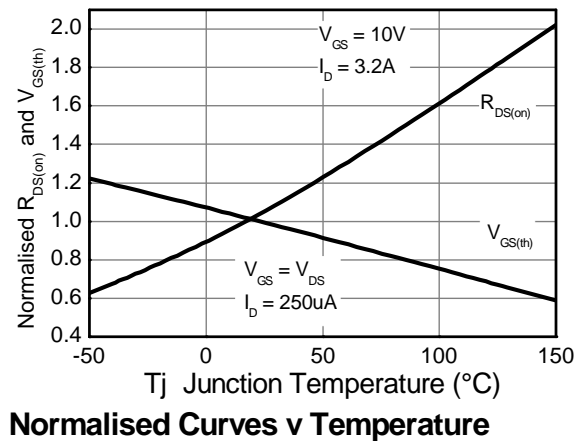
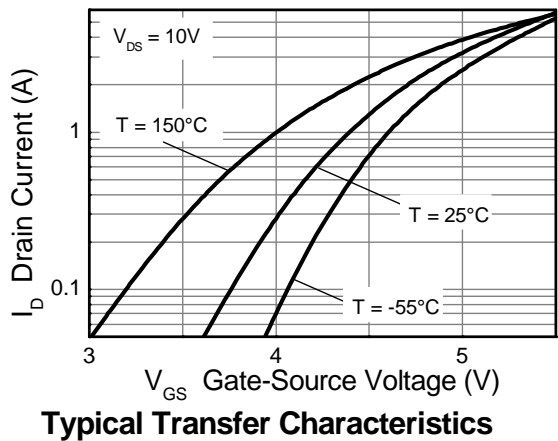
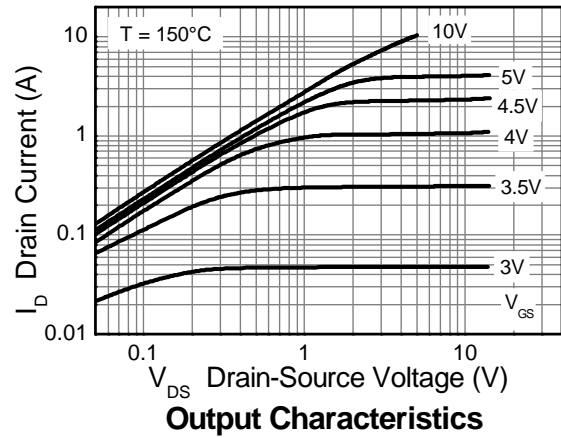
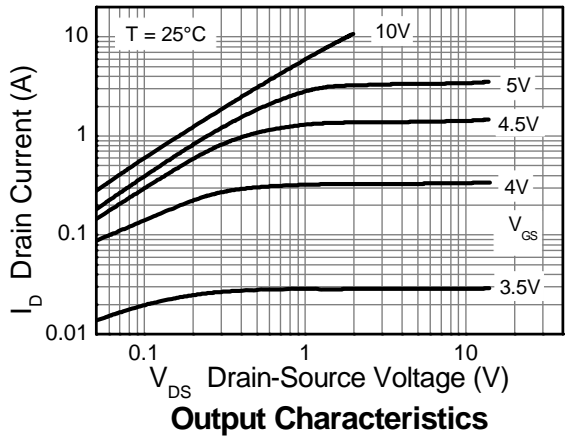


**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

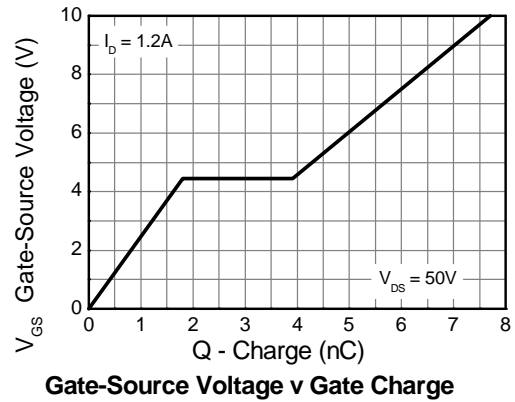
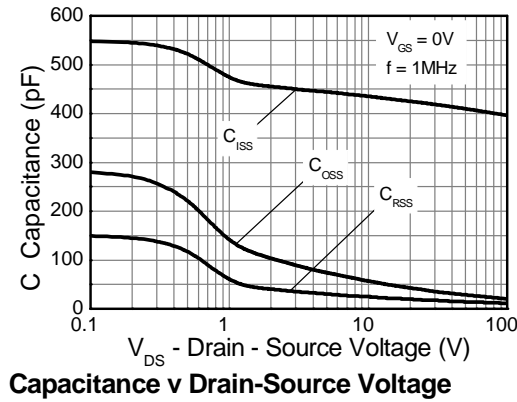
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	—	—	V	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V
Gate-Source 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>	2.0	—	4.0	V	I <sub>D</sub> = 250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(on)</sub>	—	—	0.25	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.2A
				0.30		V <sub>GS</sub> = 6V, I <sub>D</sub> = 2.6A
Forward Transconductance (Notes 8 & 10)	g <sub>fs</sub>	—	5.0	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 3.2A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	0.87	0.95	V	I <sub>S</sub> = 3.2A, V <sub>GS</sub> = 0V
Reverse recovery time (Note 10)	t <sub>rr</sub>	—	27	—	ns	I <sub>S</sub> = 1.2A, di/dt = 100A/μs
Reverse recovery charge (Note 10)	Q <sub>rr</sub>	—	32	—	nC	
<b>DYNAMIC CHARACTERISTICS (Note 10)</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	
Gate Charge (Note 9)	Q <sub>g</sub>	—	4.2	—	nC	V <sub>GS</sub> = 5V, V <sub>DS</sub> = 50V I <sub>D</sub> = 1.2A
Total Gate Charge (Note 9)	Q <sub>g</sub>	—	7.7	—	nC	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V I <sub>D</sub> = 1.2A
Gate-Source Charge (Note 9)	Q <sub>gs</sub>	—	1.8	—	nC	
Gate-Drain Charge (Note 9)	Q <sub>gd</sub>	—	2.1	—	nC	
Turn-On Delay Time (Note 9)	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 9)	t <sub>r</sub>	—	2.2	—	ns	
Turn-Off Delay Time (Note 9)	t <sub>d(off)</sub>	—	8	—	ns	
Turn-Off Fall Time (Note 9)	t <sub>f</sub>	—	3.2	—	ns	

Notes: 8. Measured under pulsed conditions. Width 300μs. Duty cycle 2%.  
 9. Switching characteristics are independent of operating junction temperature.  
 10. For design aid only, not subject to production testing.

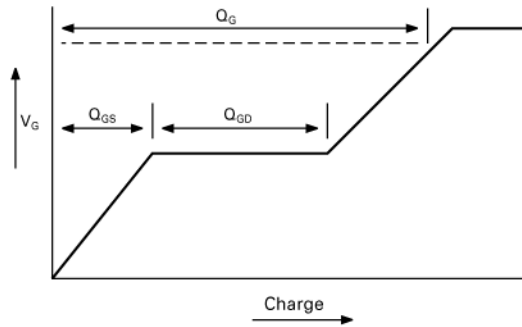
**Typical characteristics**



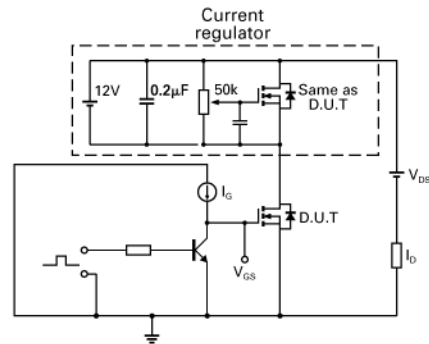
**Typical characteristics - Continued**



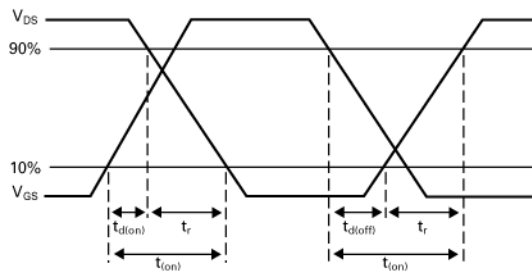
**Test Circuits**



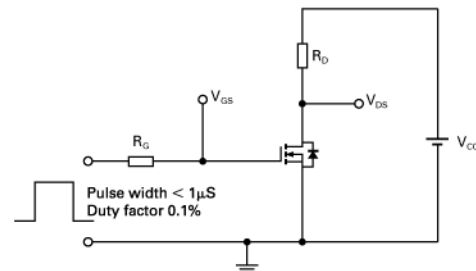
**Basic gate charge waveform**



**Gate charge test circuit**

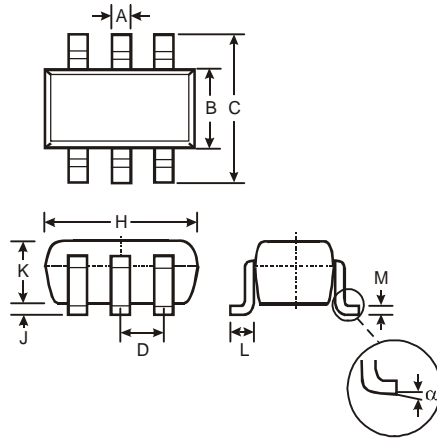


**Switching time waveforms**



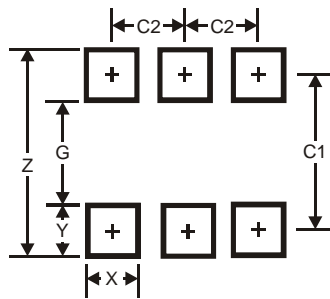
**Switching time test circuit**

**Package Outline Dimensions**



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**



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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