

# ZXMN6A25N8 60V SO8 N-channel enhancement mode MOSFET

### **Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)
60	0.050 @ V <sub>GS</sub> =10V	7.0
	0.070 @ V <sub>GS</sub> =4.5V	



# **Description**

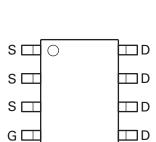
This new generation Trench MOSFET from Zetex features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

### **Features**

- · Low on-resistance
- · Fast switching speed
- · Low gate drive
- SO8 package

### **Applications**

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



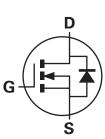
Top view

## **Ordering information**

Device	Reel size (inches)	Tape width (mm)	Quantity per reel	
ZXMN6A25N8TA	7	12	500	

### **Device marking**

ZXMN6A25



## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-Source voltage	$V_{DSS}$	60	V
Gate-Source voltage	$V_{GS}$	± 20	V
Continuous Drain current @ V <sub>GS</sub> = 10V; T <sub>A</sub> =25°C (b)	I <sub>D</sub>	5.7	Α
@ $V_{GS}$ = 10V; $T_A$ =70°C (D)		4.5	
@ $V_{GS}$ = 10V; $T_A$ =25°C <sup>(a)</sup>		4.3	
@ V <sub>GS</sub> = 10V; T <sub>L</sub> =25°C <sup>(a)(d)</sup>		7.0	
Pulsed Drain current (c)	I <sub>DM</sub>	25.7	А
Continuous Source current (Body diode) (b)	Is	4.1	А
Pulsed Source current (Body diode) (c)	I <sub>SM</sub>	25.7	А
Power dissipation at T <sub>A</sub> =25°C <sup>(a)</sup> Linear derating factor	P <sub>D</sub>	1.56 12.5	W mW/°C
Power dissipation at T <sub>A</sub> =25°C <sup>(b)</sup> Linear derating factor	P <sub>D</sub>	2.8 22.2	W mW/°C
Power dissipation at T <sub>L</sub> =25°C <sup>(d)</sup> Linear derating factor	P <sub>D</sub>	4.14 33.1	W mW/°C
Operating and storage temperature range	T <sub>j</sub> , T <sub>stg</sub>	-55 to 150	°C

### Thermal resistance

Parameter	Symbol	Value	Unit	
Junction to ambient <sup>(a)</sup>	$R_{ heta JA}$	80	°C/W	
Junction to ambient <sup>(b)</sup>	$R_{ heta JA}$	45	°C/W	
Junction to lead <sup>(d)</sup>	$R_{ heta JL}$	30.2	°C/W	

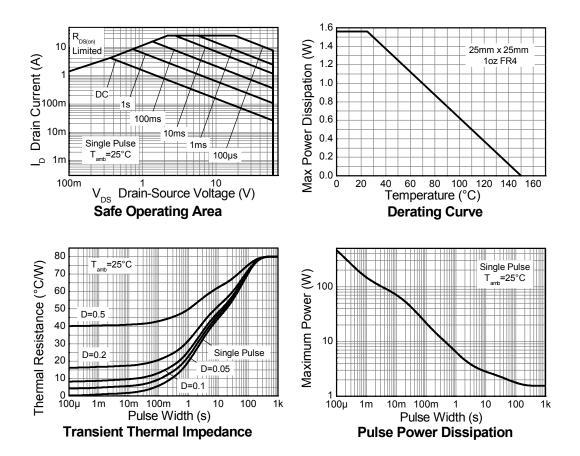
#### NOTES:

<sup>(</sup>a) 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.

<sup>(</sup>b) Mounted on FR4 PCB measured at  $t \le 10$  sec. (c) Repetitive rating on 25mm x 25mm FR4 PCB, D=0.02, pulse width 300us – pulse width limited by maximum junction temperature.

<sup>(</sup>d) Thermal resistance from junction to solder-point (at the end of the drain lead).

### Thermal characteristics



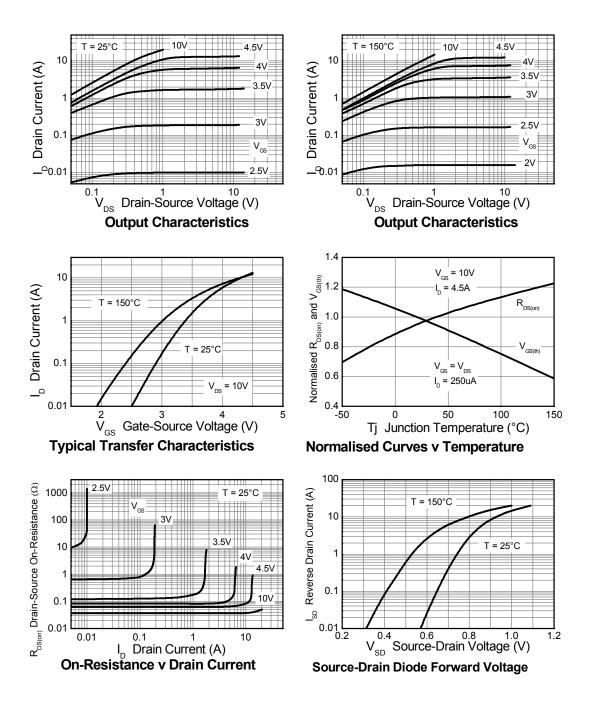
# Electrical characteristics (at $T_{amb} = 25$ °C unless otherwise stated)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Static	,		,	•	ı	1
Drain-Source breakdown voltage	V <sub>(BR)DSS</sub>	60			V	$I_D = 250 \mu A, V_{GS} = 0V$
Zero gate voltage drain current	I <sub>DSS</sub>			1.0	μA	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V
Gate-Body leakage	I <sub>GSS</sub>			100	nA	$V_{GS}$ =±20V, $V_{DS}$ =0V
Gate-Source threshold voltage	V <sub>GS(th)</sub>	1		3	V	$I_D$ =250 $\mu$ A, $V_{DS}$ = $V_{GS}$
Static Drain-Source on-state resistance (*)	R <sub>DS(on)</sub>			0.050 0.070	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.6A V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3.0A
Forward Transconductance (*)(†)	9 <sub>fs</sub>		10.2		S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 4.5A
Dynamic <sup>(†)</sup>						
Input capacitance	C <sub>iss</sub>		1063		pF	
Output capacitance	C <sub>oss</sub>		104		pF	V <sub>DS</sub> = 30V, V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>		64		pF	f=1MHz
Switching (‡)(†)						
Turn-on-delay time	t <sub>d(on)</sub>		3.8		ns	
Rise time	t <sub>r</sub>		4.0		ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V
Turn-off delay time	t <sub>d(off)</sub>		26.2		ns	I <sub>D</sub> = 1A R <sub>G</sub> ≅ 6.0Ω,
Fall time	t <sub>f</sub>		10.6		ns	TKG=0.052,
Gate charge	Qg		11.0		nC	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 5V I <sub>D</sub> = 4.5A
Total gate charge	Qg		20.4		nC	
Gate-Source charge	Q <sub>gs</sub>		4.1		nC	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 10V
Gate-Drain charge	Q <sub>gd</sub>		5.1		nC	I <sub>D</sub> = 4.5A
Source-Drain diode			ı		1	
Diode forward voltage (*)	V <sub>SD</sub>		0.85	0.95	V	I <sub>S</sub> = 5.5A,V <sub>GS</sub> =0V
Reverse recovery time (‡)	t <sub>rr</sub>		22.0		ns	L = 2.24 di/dt=4004/:-
Reverse recovery charge <sup>(‡)</sup>	Q <sub>rr</sub>		21.4		nC	-I <sub>S</sub> = 2.2A,di/dt=100A/μs

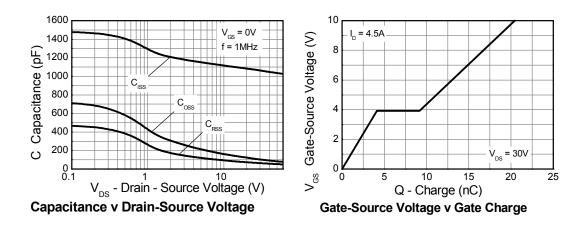
## NOTES:

<sup>(\*)</sup> Measured under pulsed conditions. Pulse width  $\leq 300 \mu s$ ; duty cycle  $\leq 2\%$ . (†)Switching characteristics are independent of operating junction temperature. (‡)For design aid only, not subject to production testing

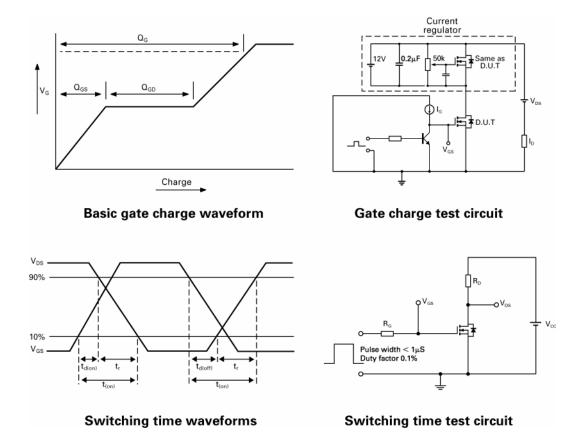
### **Typical characteristics**



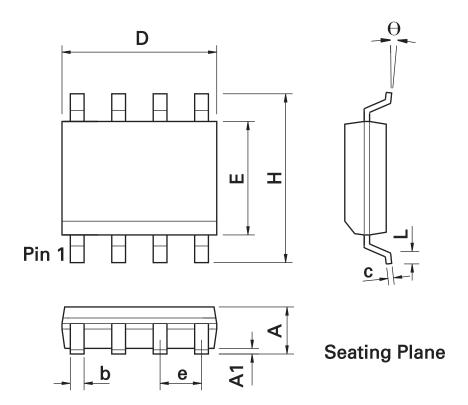
## **Typical characteristics**



### **Test circuits**



# Package outline SO8



**SO8 Package Information** 

DIM	Inc	hes	Millin	neters	DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
Α	0.053	0.069	1.35	1.75	е	0.050 BSC		1.27 BSC	
A1	0.004	0.010	0.10	0.25	b	0.013	0.020	0.33	0.51
D	0.189	0.197	4.80	5.00	С	0.008	0.010	0.19	0.25
Н	0.228	0.244	5.80	6.20	U	0°	8°	0°	8°
E	0.150	0.157	3.80	4.00	h	0.010	0.020	0.25	0.50
L	0.016	0.050	0.40	1.27	-	-	-	-	-

Note: Controlling dimensions are in inches. Approximate dimensions are provided in millimeters

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"Active" Product status recommended for new designs

"Active ULTB)" Device will be discontinued and last time buy period and delivery is in effect

"Not recommended for new designs"

"Obsolete" Device is still in production to support existing designs and production

Production has been discontinued

Datasheet status key:

"Draft version" This term denotes a very early datasheet version and contains highly provisional

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"Provisional version"

This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance.
However, changes to the test conditions and specifications may occur, at any time and without notice.

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