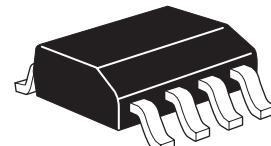


ZXMN6A25DN8

Dual 60V SO8 N-channel enhancement mode MOSFET

Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ (Ω)	I_D (A)
60	0.050 @ $V_{GS} = 10V$	5
	0.070 @ $V_{GS} = 4.5V$	4.2

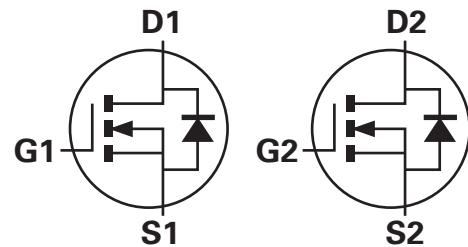


Description

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.

Features

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

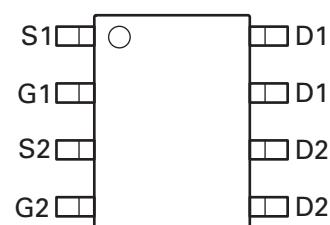


Applications

- DC - DC converters
- Power management functions
- Motor control

Ordering information

Device	Reel (inches)	Tape width (mm)	Quantity per reel
ZXMN6A25DN8TA	7	12	500
ZXMN6A25DN8TC	13	12	2500



Pin out - top view

Device marking

ZXMN
6A25D

ZXMN6A25DN8

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DSS}	60	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current @ $V_{GS}=10V$; $T_{amb}=25^{\circ}C$ (b) (d)	I_D	5	A
@ $V_{GS}=10V$; $T_{amb}=70^{\circ}C$ (b) (d)		4	A
@ $V_{GS}=10V$; $T_{amb}=25^{\circ}C$ (a) (d)		3.8	A
Pulsed drain current ^(c)	I_{DM}	24	A
Continuous source current (body diode) ^(b)	I_S	3.4	A
Pulsed source current (body diode) ^(c)	I_{SM}	24	A
Power dissipation at $T_{amb}=25^{\circ}C$ (a) (d)	P_D	1.25	W
Linear derating factor		10	$mW/^{\circ}C$
Power dissipation at $T_{amb}=25^{\circ}C$ (a) (e)	P_D	1.8	W
Linear derating factor		14	$mW/^{\circ}C$
Power dissipation at $T_{amb}=25^{\circ}C$ (b) (d)	P_D	2.1	W
Linear derating factor		17	$mW/^{\circ}C$
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

Thermal resistance

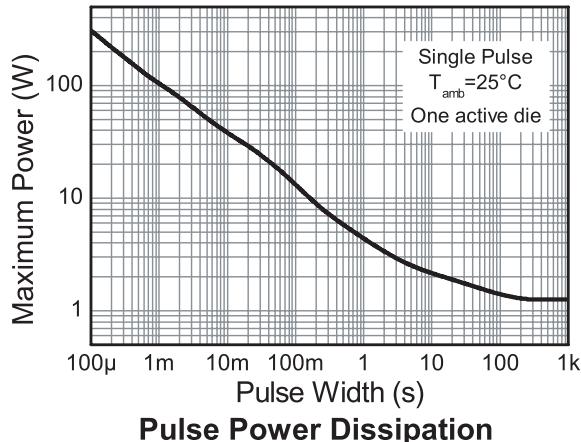
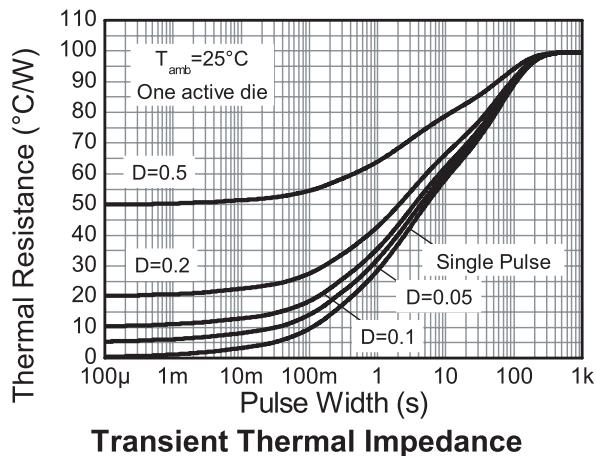
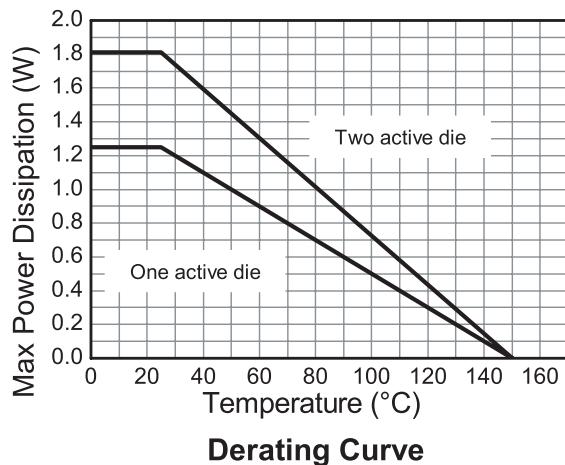
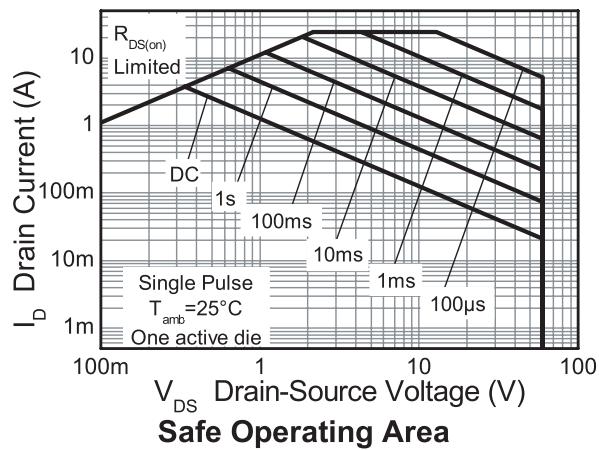
Parameter	Symbol	Limit	Unit
Junction to ambient ^{(a) (d)}	$R_{\Theta JA}$	100	°C/W
Junction to ambient ^{(a) (e)}	$R_{\Theta JA}$	70	°C/W
Junction to ambient ^{(b) (d)}	$R_{\Theta JA}$	60	°C/W

NOTES:

NOTES:

- (a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- (b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ sec.
- (c) Repetitive rating 25mm x 25mm FR4 PCB, $D=0.02$, pulse width=300 μ s - pulse width limited by maximum junction temperature.
- (d) For a dual device with one active die.
- (e) For a device with two active die running at equal power.

Typical characteristics



ZXMN6A25DN8

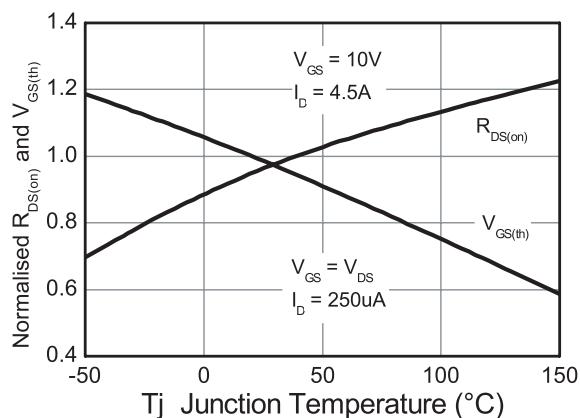
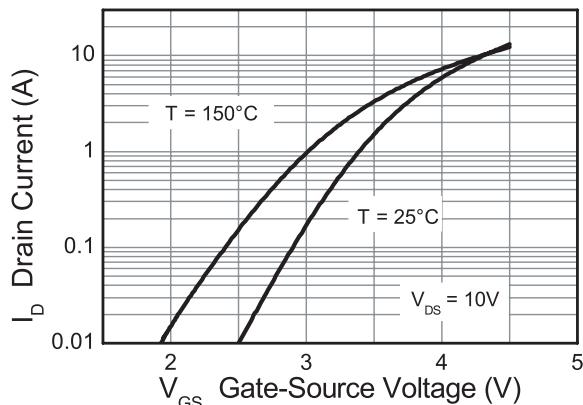
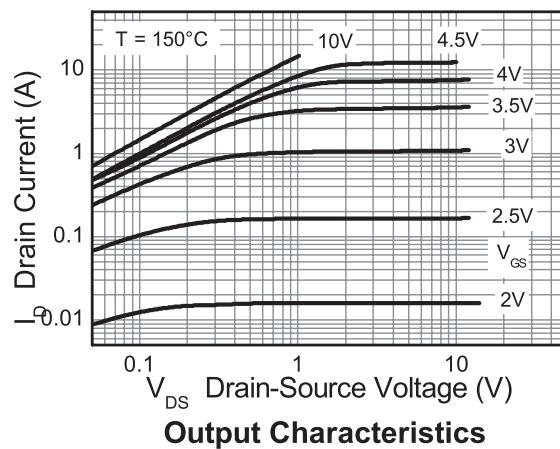
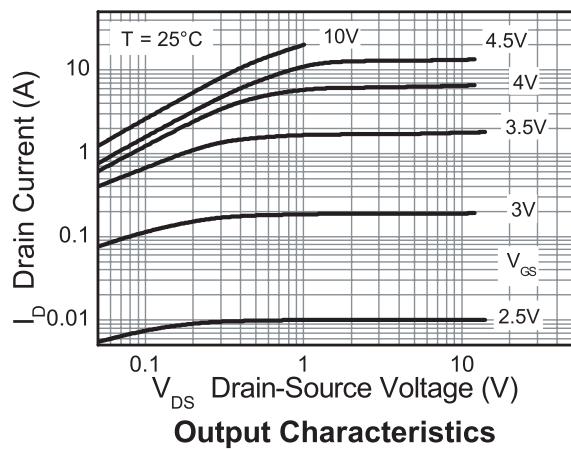
Electrical characteristics (at $T_{amb} = 25^\circ C$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	60			V	$I_D=250\mu A, V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}			1.0	mA	$V_{DS}=60V, V_{GS}=0V$
Gate-body leakage	I_{GSS}			100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Gate-source threshold voltage	$V_{GS(th)}$	1.0			V	$I_D=250\mu A, V_{DS}=V_{GS}$
Static drain-source on-state resistance (*)	$R_{DS(on)}$			0.050 0.070	Ω	$V_{GS}=10V, I_D=3.6A$ $V_{GS}=4.5V, I_D=3A$
Forward transconductance ^(*) (‡)	g_{fs}		10.2		S	$V_{DS}=15V, I_D=4.5A$
Dynamic^(‡)						
Input capacitance	C_{iss}		1063		pF	$V_{DS}=30V, V_{GS}=0V, f=1MHz$
Output capacitance	C_{oss}		104		pF	
Reverse transfer capacitance	C_{rss}		64		pF	
Switching^(†) (‡)						
Turn-on delay time	$t_{d(on)}$		3.8		ns	$V_{DD}=30V, I_D=1A$ $RG \approx 6.0\Omega, V_{GS}=10V$
Rise time	t_r		4.0		ns	
Turn-off delay time	$t_{d(off)}$		26.2		ns	
Fall Time	t_f		10.6		ns	
Gate charge	Q_g		11.0		nC	$V_{DS}=30V, V_{GS}=5V, I_D=4.5A$
Total gate charge	Q_g		20.4		nC	$V_{DS}=30V, V_{GS}=10V, I_D=4.5A$
Gate-source charge	Q_{gs}		4.1		nC	
Gate-drain charge	Q_{gd}		5.1		nC	
Source-drain diode						
Diode Forward Voltage ^(*)	V_{SD}		0.85	0.95	V	$T_J=25^\circ C, I_S=5.5A, V_{GS}=0V$
Reverse recovery time ^(‡)	t_{rr}		22.0		ns	$T_J=25^\circ C, I_F=2.2A, di/dt= 100A/\mu s$
Reverse recovery charge ^(‡)	Q_{rr}		21.4		nC	

NOTES:

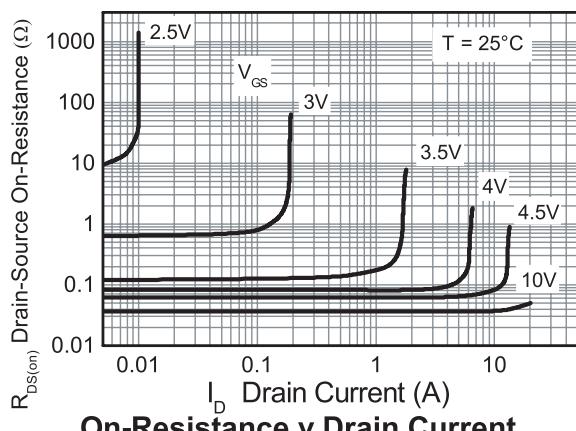
- (*) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
- (†) Switching characteristics are independent of operating junction temperature.
- (‡) For design aid only, not subject to production testing.

Typical characteristics

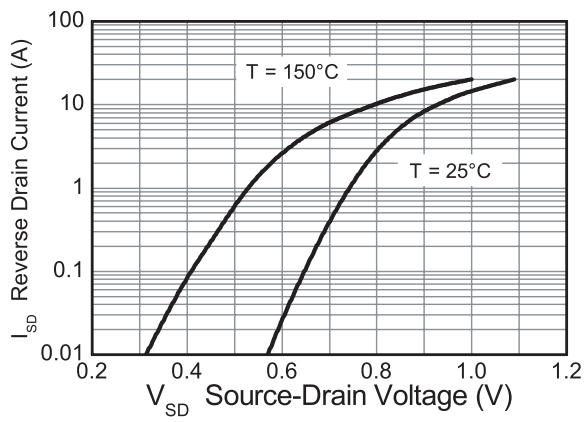


Typical Transfer Characteristics

Normalised Curves v Temperature

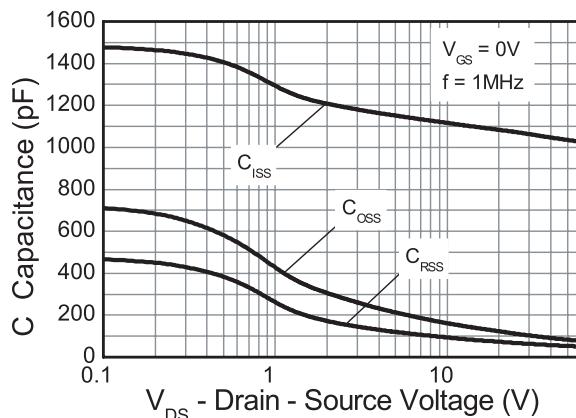


On-Resistance v Drain Current

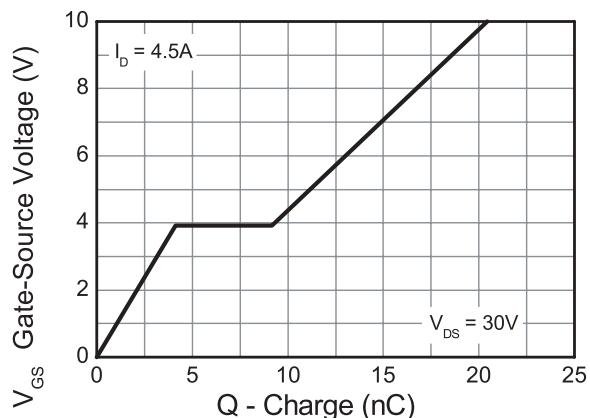


Source-Drain Diode Forward Voltage

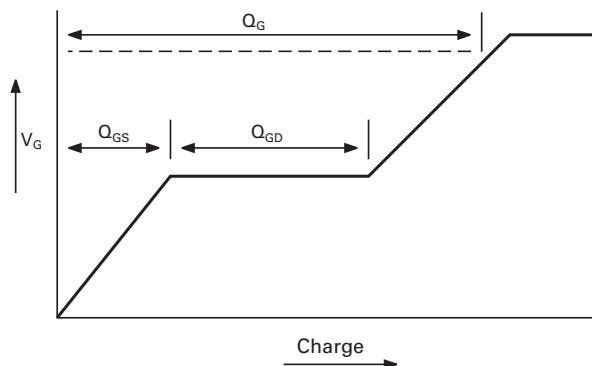
Typical characteristics



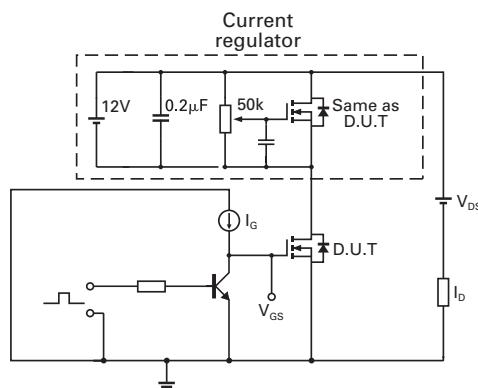
Capacitance v Drain-Source Voltage



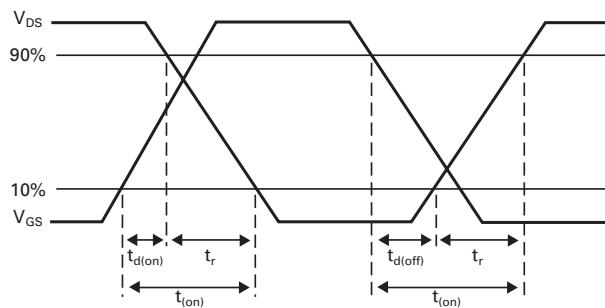
Gate-Source Voltage v Gate Charge



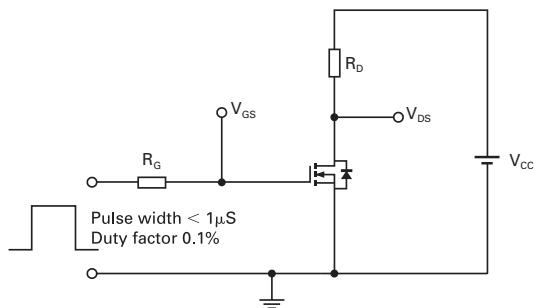
Basic gate charge waveform



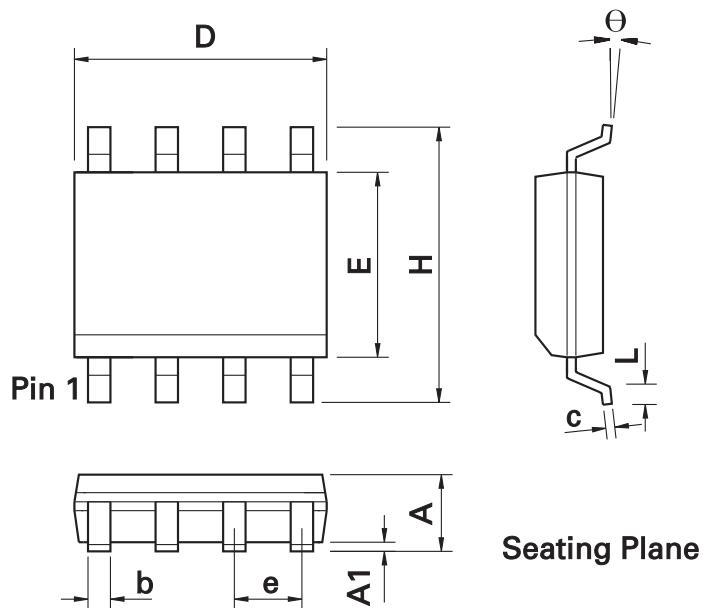
Gate charge test circuit



Switching time waveforms



Switching time test circuit

Package outline - SO8

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.053	0.069	1.35	1.75	e	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	c	0.008	0.010	0.19	0.25
H	0.228	0.244	5.80	6.20	Θ	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

ZXMN6A25DN8

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