优尚

YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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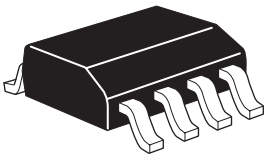
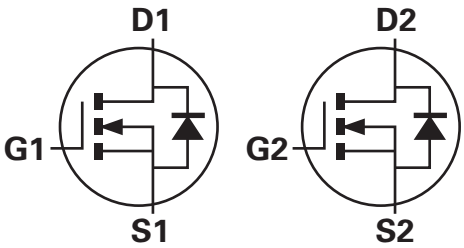
Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ (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.

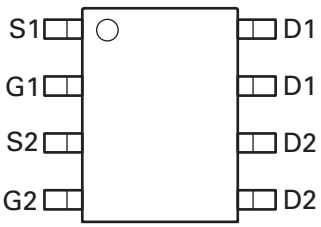


Features

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

Applications

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



Pin out - top view

Ordering information

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

Device marking

NK-ZXMN
6A25D

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°C[b] [d]	I_D	5	A
@V_{GS}=10V; T_{amb}=70°C[b] [d]		4	A
@V_{GS}=10V; T_{amb}=25°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°C[a] [d]	P_D	1.25	W
Linear derating factor		10	mW/°C
Power dissipation at T_{amb}=25°C[a] [e]	P_D	1.8	W
Linear derating factor		14	mW/°C
Power dissipation at T_{amb}=25°C[b] [d]	P_D	2.1	W
Linear derating factor		17	mW/°C
Operating and storage temperature range	T_j:T_{stg}	-55 to +150	°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:

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

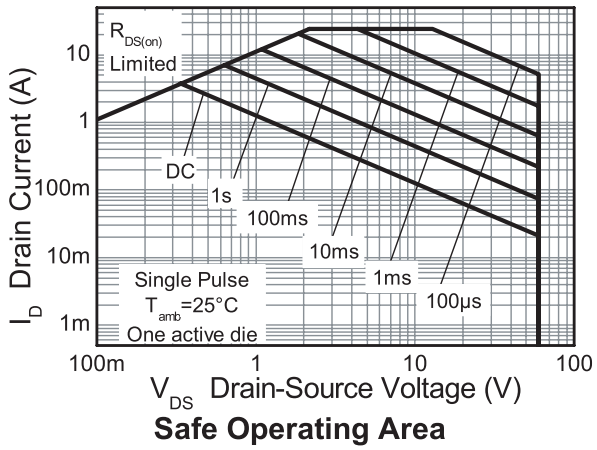
(b) For a device surface mounted on FR4 PCB measured at t ≤10 sec.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D=0.02, pulse width=300μs - pulse width limited by maximum junction temperature.

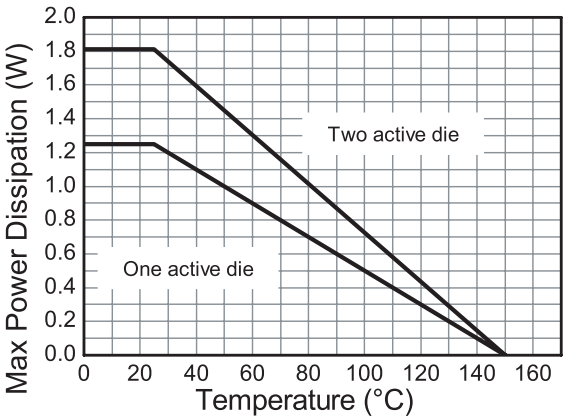
(d) For a dual device with one active die.

(e) For a device with two active die running at equal power.

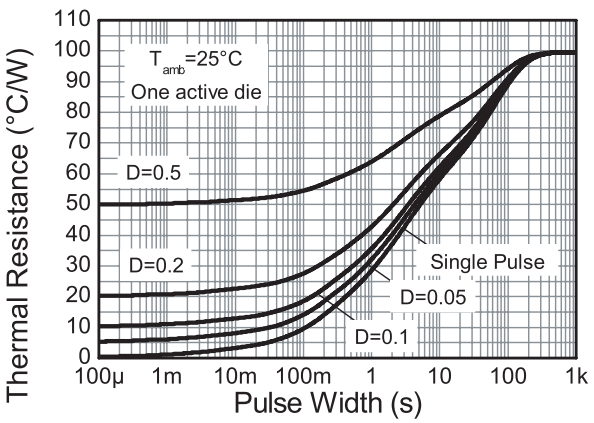
Typical characteristics



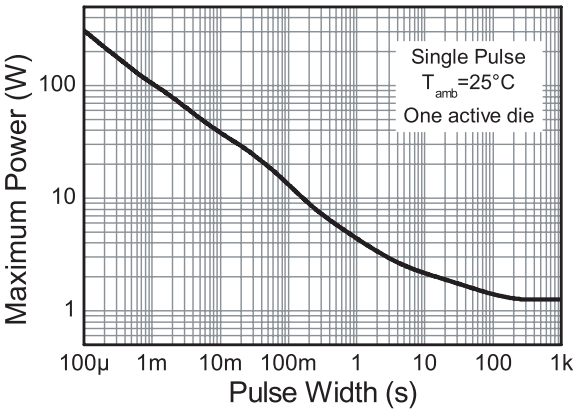
Safe Operating Area



Derating Curve



Transient Thermal Impedance



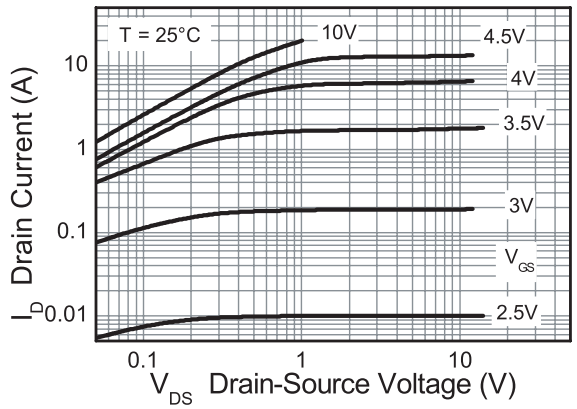
Pulse Power Dissipation

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

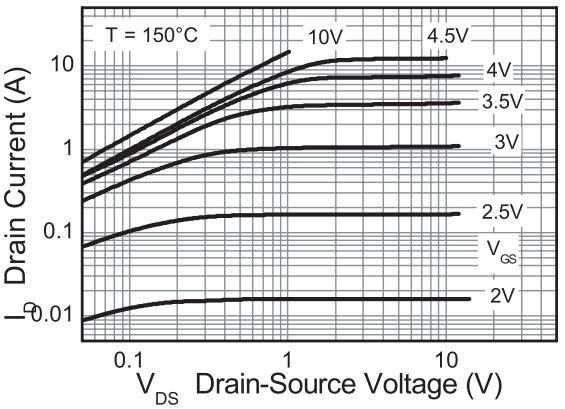
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	60			V	I_D=250μA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}			1.0	mA	V_{DS}=60V, V_{GS}=0V
Gate-body leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-source threshold voltage	$V_{GS(th)}$	1.0			V	I_D=250μA, V_{DS}= V_{GS}
Static drain-source on-state resistance (*)	$R_{DS(on)}$			0.050 0.070	Ω 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≅6.0Ω, 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°C, I_S=5.5A,V_{GS}=0V
Reverse recovery time(‡)	t_{rr}		22.0		ns	T_J=25°C, I_F=2.2A, di/dt= 100A/μs
Reverse recovery charge(‡)	Q_{rr}		21.4		nC	

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

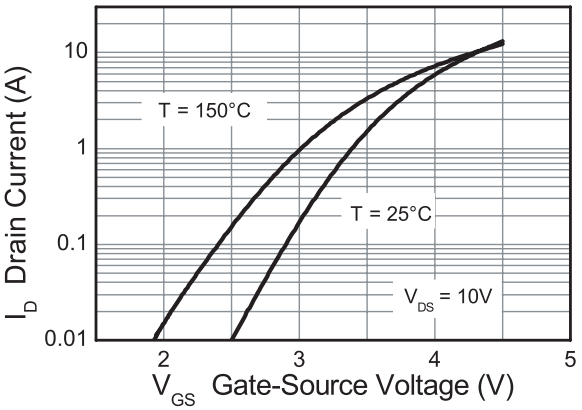
Typical characteristics



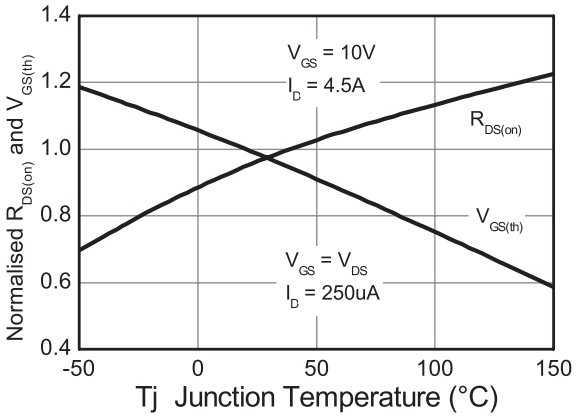
Output Characteristics



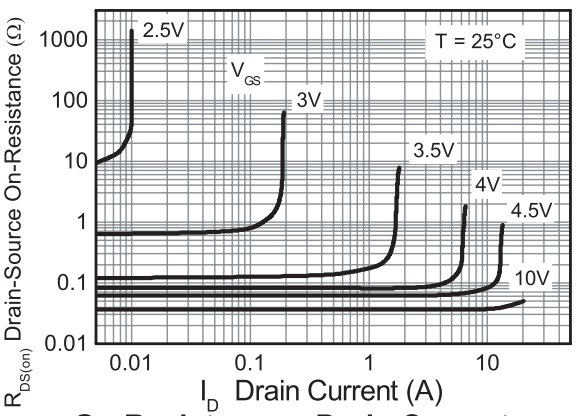
Output Characteristics



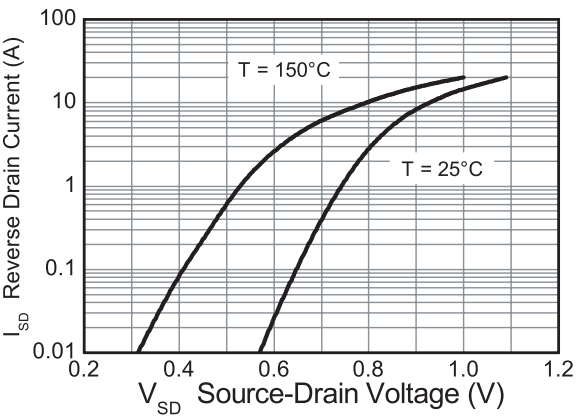
Typical Transfer Characteristics



Normalised Curves v Temperature

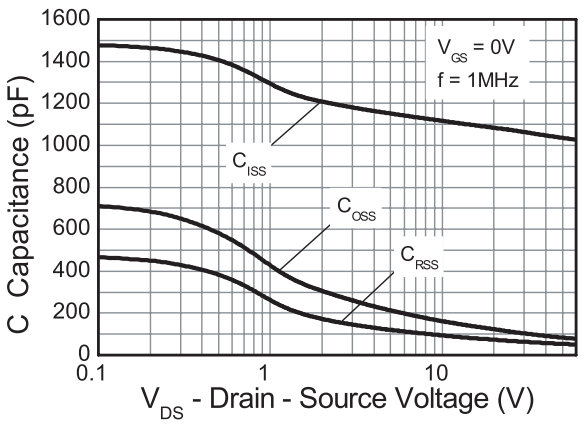


On-Resistance v Drain Current

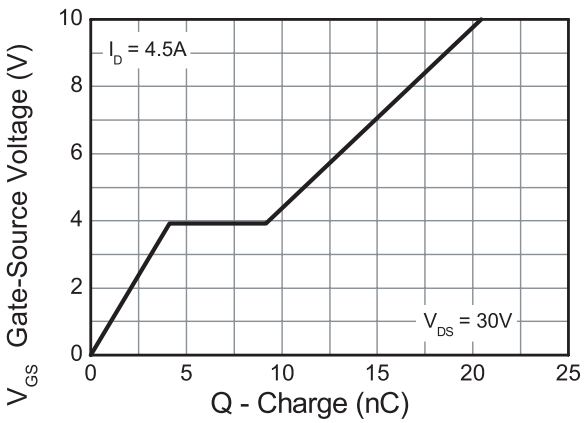


Source-Drain Diode Forward Voltage

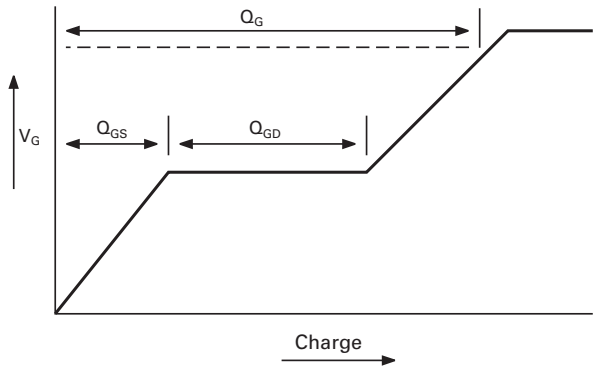
Typical characteristics



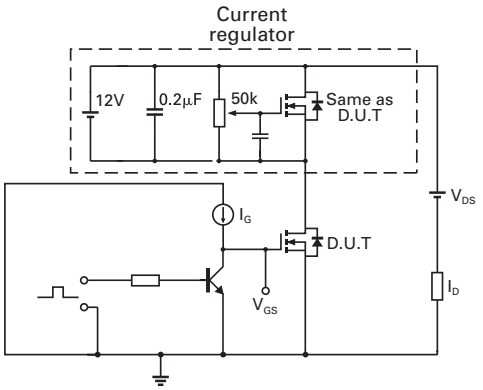
Capacitance v Drain-Source Voltage



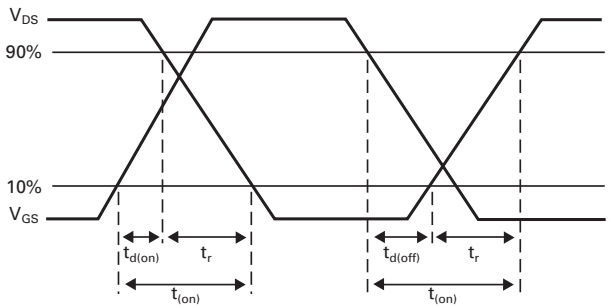
Gate-Source Voltage v Gate Charge



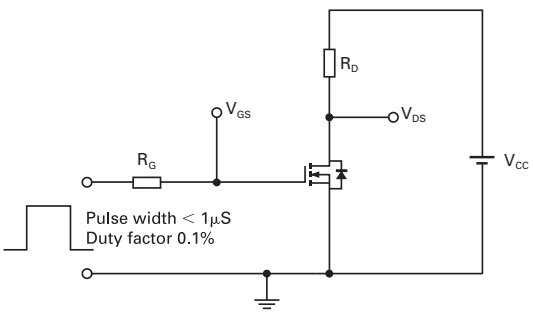
Basic gate charge waveform



Gate charge test circuit

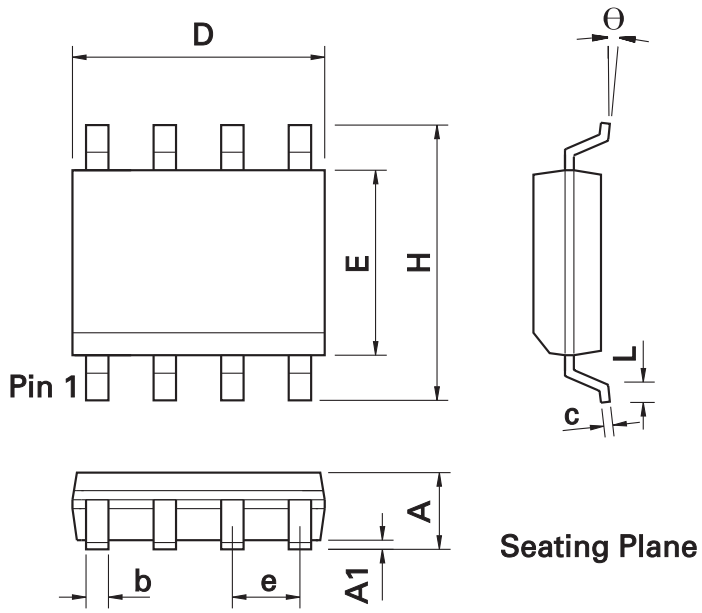


Switching time waveforms



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