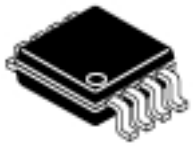
ZXMN6A11DN8

DUAL 60V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}$=60V; $R_{DS(ON)}$=0.15Ω I_D=2.7A



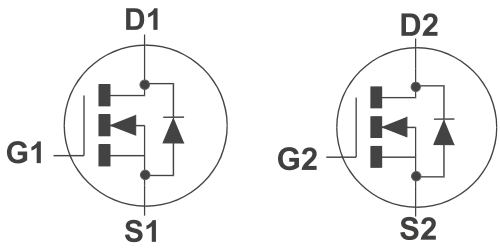
SO8

DESCRIPTION

This new generation of TRENCH MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

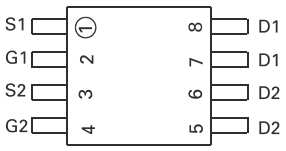
FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package



APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control



Top View

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN6A11DN8TA	7”	12mm	500 units
ZXMN6A11DN8TC	13”	12mm	2500 units

DEVICE MARKING

- ZXMN
  6A11D

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_A=25°C)(b)(d) (V_{GS}=10V; T_A=70°C)(b)(d) (V_{GS}=10V; T_A=25°C)(a)(d)	I_D	2.7 2.2 2.1	A
Pulsed Drain Current (c)	I_{DM}	8.3	A
Continuous Source Current (Body Diode) (b)	I_S	3.2	A
Pulsed Source Current (Body Diode)(c)	I_{SM}	8.3	A
Power Dissipation at T_A=25°C (a)(d) Linear Derating Factor	P_D	1.25 10	W mW/°C
Power Dissipation at T_A=25°C (a)(e) Linear Derating Factor	P_D	1.8 14	W mW/°C
Power Dissipation at T_A=25°C (b)(d) Linear Derating Factor	P_D	2.1 17	W mW/°C
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	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

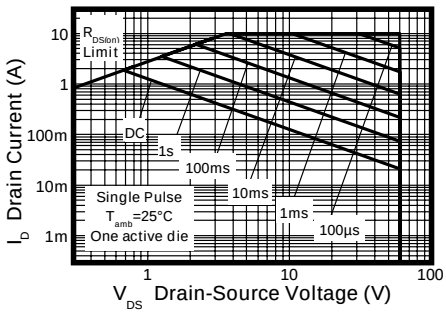
(b) For a device surface mounted on FR4 PCB measured at t⩽10 secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D=0.05 pulse width=10µs - pulse width limited by maximum junction temperature.

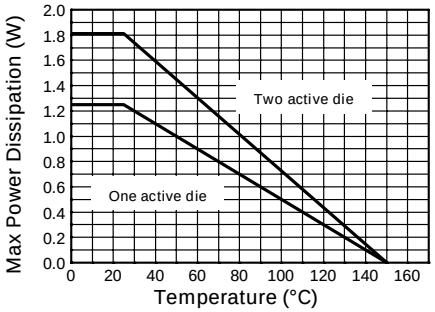
(d) For device with one active die

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

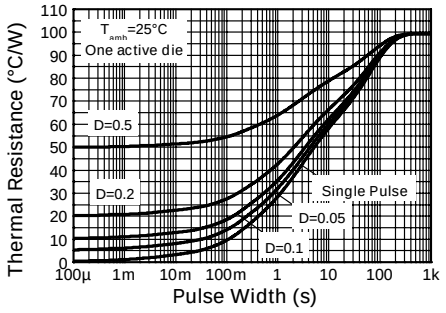
TYPICAL CHARACTERISTICS



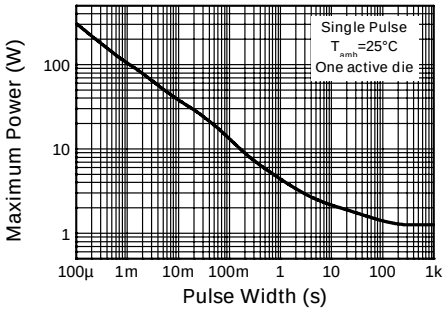
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

ELECTRICAL CHARACTERISTICS (at T_A = 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	μA	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 (1)	$R_{DS(on)}$			0.150 0.250	Ω Ω	V_{GS}=10V, I_D=4.4A V_{GS}=4.5V, I_D=3.8A
Forward Transconductance (3)	g_{fs}		4.9		S	V_{DS}=15V,I_D=2.5A
DYNAMIC (3)						
Input Capacitance	C_{iss}		330		pF	V_{DS}=40 V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		35.2		pF	
Reverse Transfer Capacitance	C_{rss}		17.1		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		1.95		ns	V_{DD} =15V, I_D=2.5A R_G=6.0Ω, V_{GS}=10V (refer to test circuit)
Rise Time	t_r		3.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		8.2		ns	
Fall Time	t_f		4.6		ns	
Gate Charge	Q_g		3.0		nC	V_{DS}=15V,V_{GS}=5V, I_D=2.5A
Total Gate Charge	Q_g		5.7		nC	V_{DS}=15V,V_{GS}=10V, I_D=2.5A (refer to test circuit)
Gate-Source Charge	Q_{gs}		1.25		nC	
Gate-Drain Charge	Q_{gd}		0.86		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}		0.85	0.95	V	T_J=25°C, I_S=2.8A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		21.5		ns	T_J=25°C, I_F=2.5A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		20.5		nC	

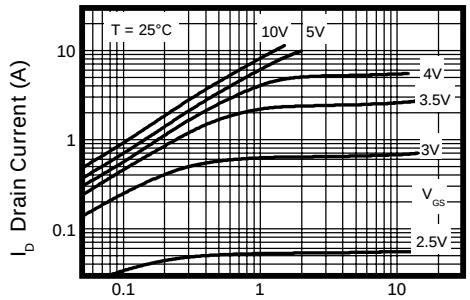
NOTES

(1) Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2% .

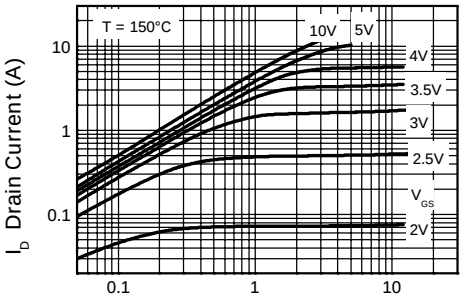
(2) Switching characteristics are independent of operating junction temperature.

(3) For design aid only, not subject to production testing.

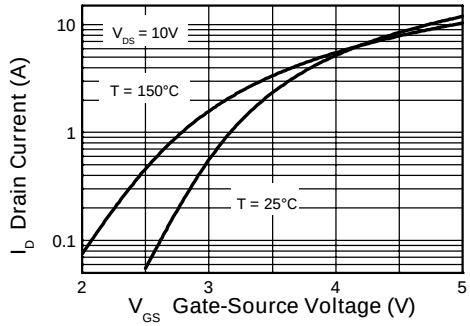
TYPICAL CHARACTERISTICS



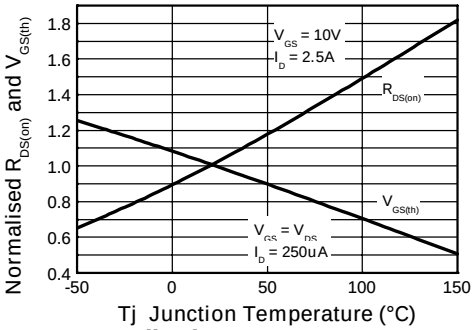
Output Characteristics



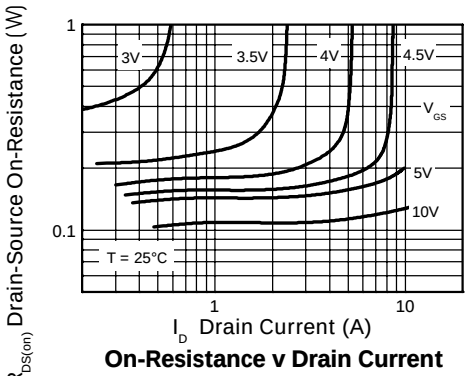
Output Characteristics



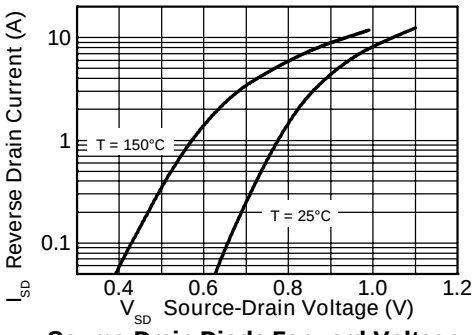
Typical Transfer Characteristics



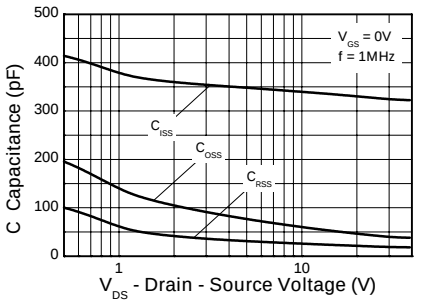
Normalised Curves v Temperature



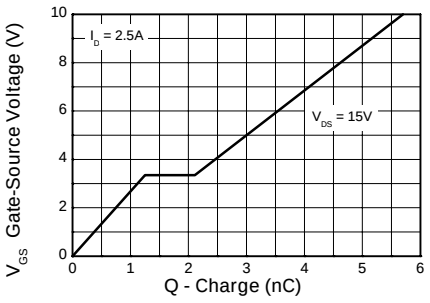
On-Resistance v Drain Current



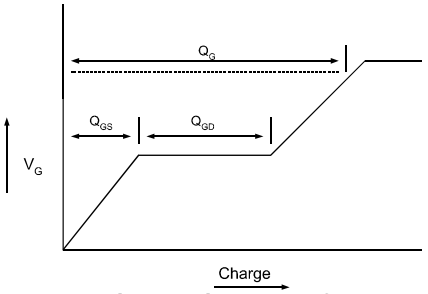
Source-Drain Diode Forward Voltage



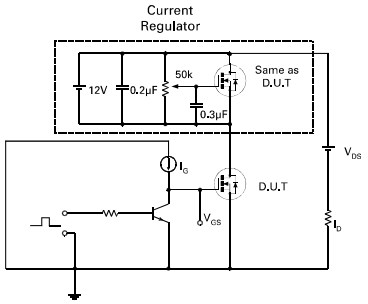
Capacitance v Drain-Source Voltage



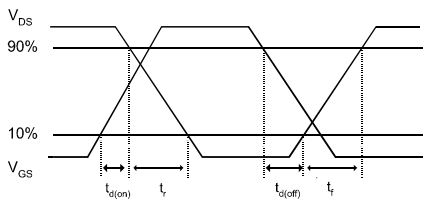
Gate-Source Voltage v Gate Charge



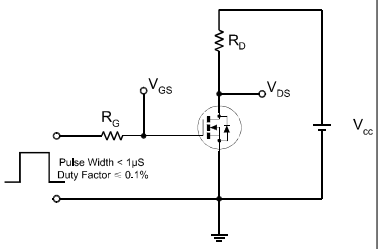
Basic Gate Charge Waveform



Gate Charge Test Circuit

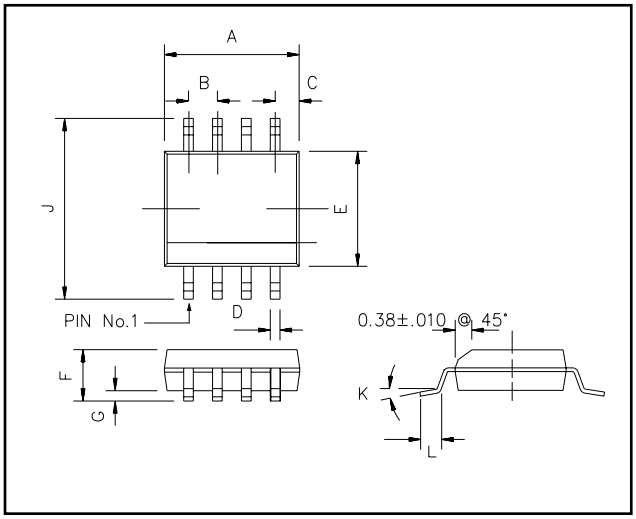


Switching Time Waveforms



Switching Time Test Circuit

ZXMN6A11DN8
PACKAGE DIMENSIONS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	4.80	4.98	0.189	0.196
B	1.27 BSC		0.05 BSC	
C	0.53 REF		0.02 REF	
D	0.36	0.46	0.014	0.018
E	3.81	3.99	0.15	0.157
F	1.35	1.75	0.05	0.07
G	0.10	0.25	0.004	0.010
J	5.80	6.20	0.23	0.24
K	0°	8°	0°	8°
L	0.41	1.27	0.016	0.050

Zetex plc.
Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.
Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)
Fax: (44)161 622 4420

Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49

Zetex Inc.
Suite 315
700 Veterans Mororial Highway
Hauppauge NY 11788
USA
Telephone: (631) 360-2222
Fax: (631)360-8222

Zetex (Asia) Ltd.
3701-04 Metroplaza, Tower 1
Hing Fong Road,
Kwai Fong
Hong Kong
Telephone:(852) 26100 611
Fax: (852) 24250 494

These are supported by
agents and distributors in
major countries world-wide

www.zetex.com