

ZXMN6A09DN8

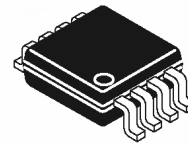
DUAL 60V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}=60V$; $R_{DS(ON)}=0.045\Omega$ $I_D=5.2A$

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.



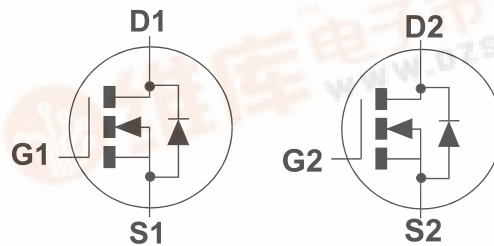
SO8

FEATURES

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

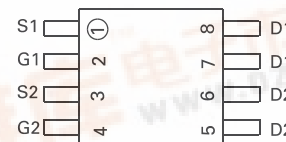
APPLICATIONS

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



ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN6A09DN8TA	7"	12mm	500 units
ZXMN6A09DN8TC	13"	12mm	2500 units



Top View

DEVICE MARKING

- ZXMN
6A09D

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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Gate Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($V_{GS}=10V$; $T_A=25^\circ C$)(b)(d) ($V_{GS}=10V$; $T_A=70^\circ C$)(b)(d) ($V_{GS}=10V$; $T_A=25^\circ C$)(a)(d)	I_D	5.2 4.1 3.9	A
Pulsed Drain Current (c)	I_{DM}	17.6	A
Continuous Source Current (Body Diode) (b)	I_S	3.5	A
Pulsed Source Current (Body Diode)(c)	I_{SM}	15	A
Power Dissipation at $T_A=25^\circ C$ (a)(d) Linear Derating Factor	P_D	1.25 10	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (a)(e) Linear Derating Factor	P_D	1.81 14.5	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b)(d) Linear Derating Factor	P_D	2.16 17.3	W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^\circ C$

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)(d)	$R_{\theta JA}$	100	$^\circ C/W$
Junction to Ambient (a)(e)	$R_{\theta JA}$	69	$^\circ C/W$
Junction to Ambient (b)(d)	$R_{\theta JA}$	58	$^\circ C/W$

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 $t \leq 10$ secs.

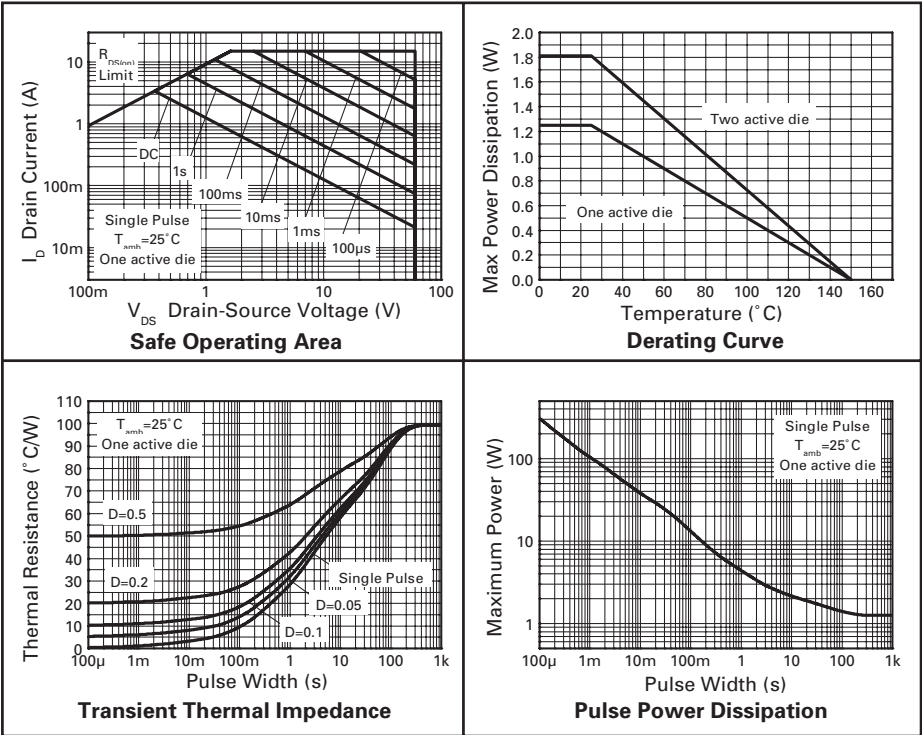
(c) Repetitive rating 25mm x 25mm FR4 PCB, $D=0.05$ pulse width=10 μs - pulse width limited by maximum junction temperature.

(d) For device with one active die

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

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THERMAL CHARACTERISTICS



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ELECTRICAL CHARACTERISTICS (at $T_A = 25^\circ\text{C}$ unless otherwise stated).

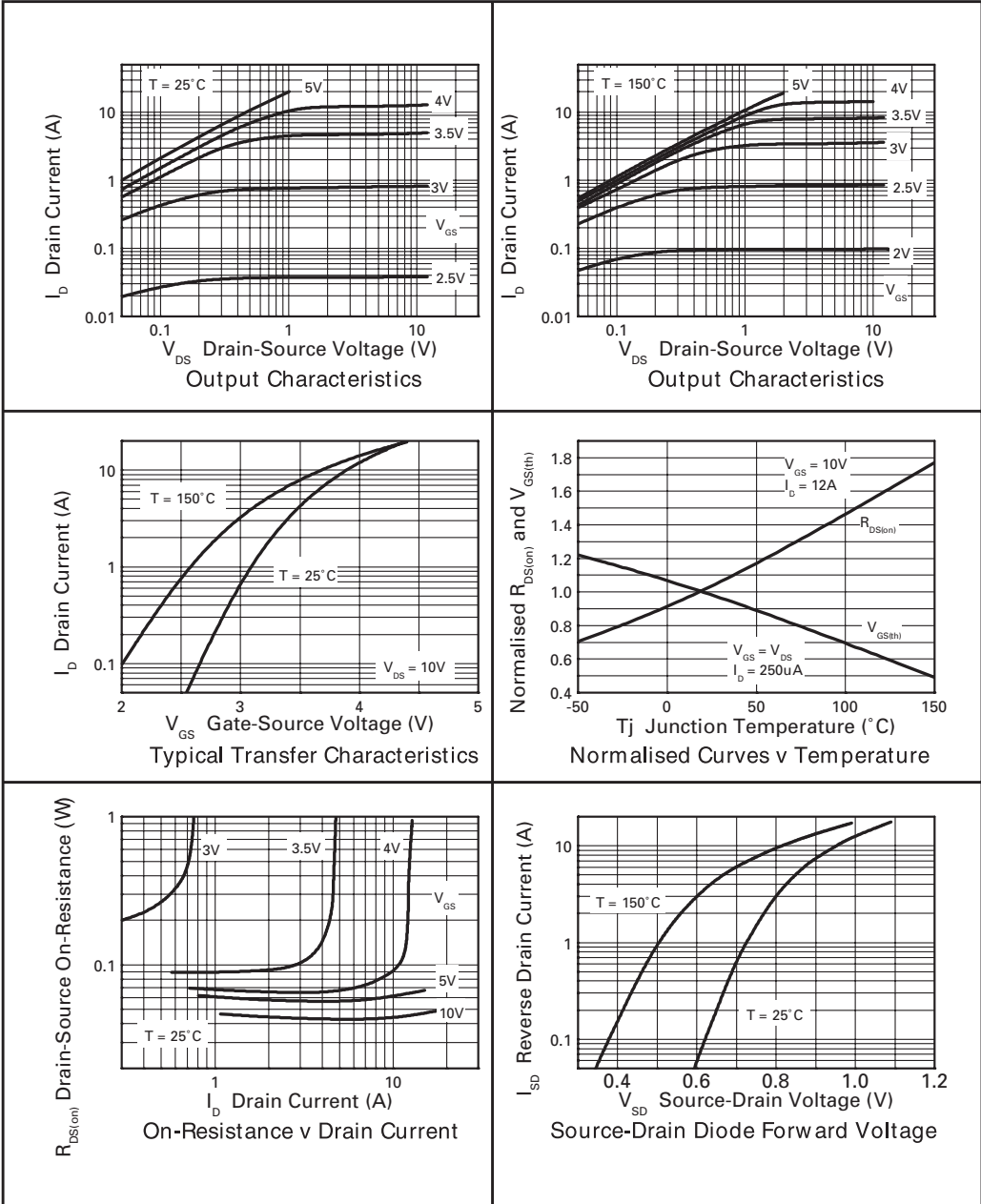
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	60			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	$V_{DS}=60\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			V	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.045 0.075	Ω Ω	$V_{GS}=10\text{V}, I_D=8.2\text{A}$ $V_{GS}=4.5\text{V}, I_D=7.4\text{A}$
Forward Transconductance (3)	g_{fs}		15		S	$V_{DS}=15\text{V}, I_D=8.2\text{A}$
DYNAMIC (3)						
Input Capacitance	C_{iss}		1407		pF	$V_{DS}=40\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	C_{oss}		121		pF	
Reverse Transfer Capacitance	C_{rss}		59		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		4.9		ns	$V_{DD}=15\text{V}, I_D=3.5\text{A}$ $R_G=6.0\Omega, V_{GS}=10\text{V}$ (refer to test circuit)
Rise Time	t_r		5.0		ns	
Turn-Off Delay Time	$t_{d(off)}$		25.3		ns	
Fall Time	t_f		4.6		ns	
Gate Charge	Q_g		12.4		nC	$V_{DS}=15\text{V}, V_{GS}=5\text{V},$ $I_D=3.5\text{A}$
Total Gate Charge	Q_g		24.2		nC	$V_{DS}=15\text{V}, V_{GS}=10\text{V},$ $I_D=3.5\text{A}$
Gate-Source Charge	Q_{gs}		5.2		nC	
Gate-Drain Charge	Q_{gd}		3.5		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}		0.85	0.95	V	$T_J=25^\circ\text{C}, I_S=6.6\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	t_{rr}		26.3		ns	$T_J=25^\circ\text{C}, I_F=3.5\text{A},$ $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	Q_{rr}		26.6		nC	

NOTES

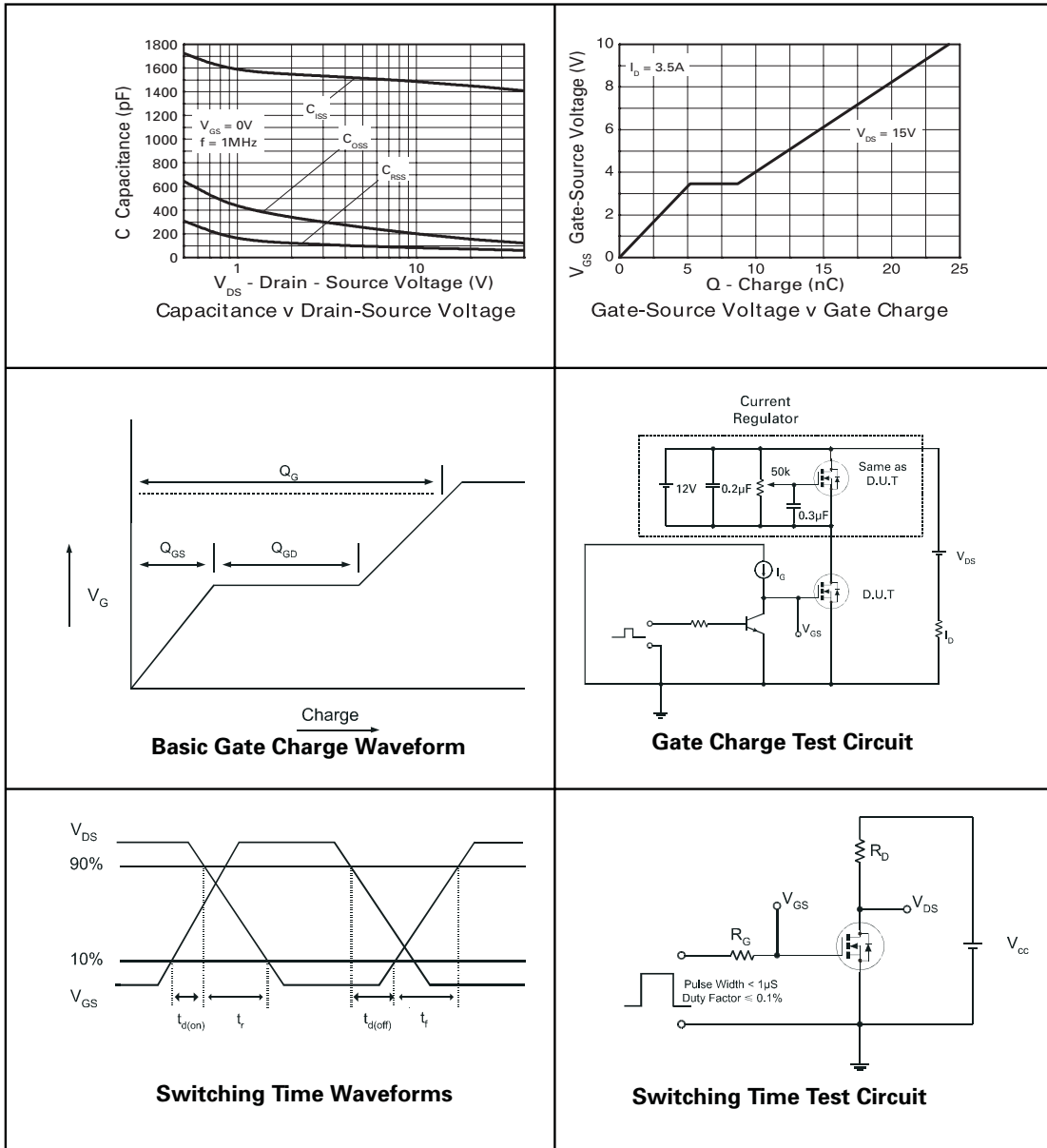
- (1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
 (2) Switching characteristics are independent of operating junction temperature.
 (3) For design aid only, not subject to production testing.

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TYPICAL CHARACTERISTICS



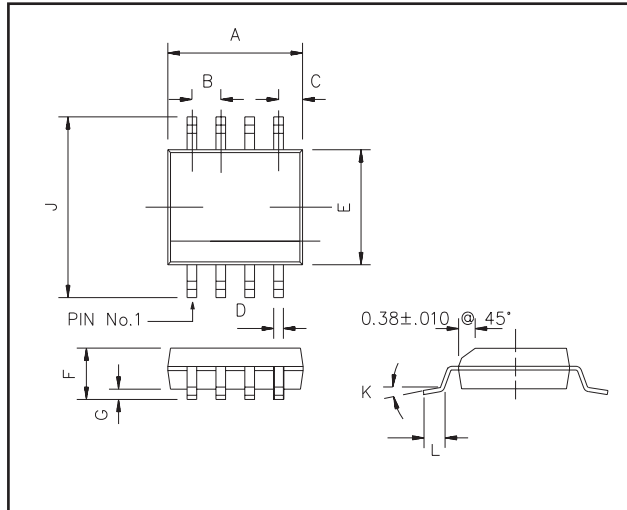
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PACKAGE DIMENSIONS



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

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