

# ZXMN2A04DN8

## DUAL 20V N-CANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

$V_{(BR)DSS}=20V$ ;  $R_{DS(ON)}=0.030\Omega$  ;  $I_D=6.8A$

### DESCRIPTION

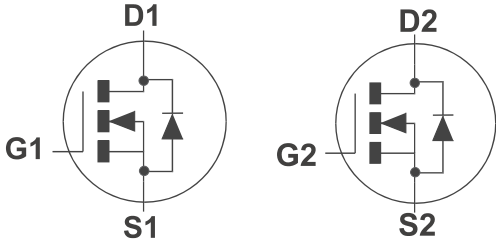
This new generation of TRENCH MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



SO8

### FEATURES

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

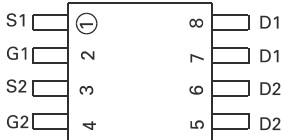


### APPLICATIONS

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

### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN2A04DN8TA	7"	12mm	500 units
ZXMN2A04DN8TC	13"	12mm	2500 units



Top View

### DEVICE MARKING

- ZXMN  
2A04D

# ZXMN2A04DN8

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DS}$	20	V
Gate Source Voltage	$V_{GS}$	$\pm 12$	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)	$I_D$	6.8 5.4 5.2	A
Pulsed Drain Current (c)	$I_{DM}$	23	A
Continuous Source Current (Body Diode) (b)	$I_S$	12	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	23	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	$P_D$	1.8 14	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b)(d) Linear Derating Factor	$P_D$	2.1 17	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)	$R_{\theta JA}$	70	$^\circ C/W$
Junction to Ambient (b)(d)	$R_{\theta JA}$	60	$^\circ C/W$

### 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= $10\mu s$  - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

(d) For device with one active die

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



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

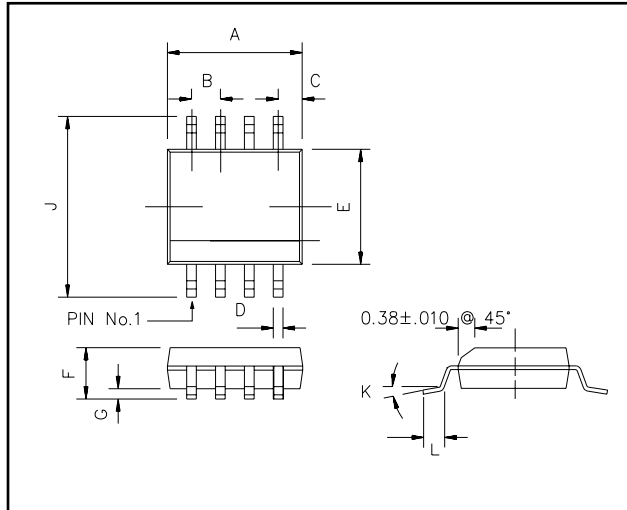
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			0.5	$\mu\text{A}$	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.7			V	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.030 0.045	$\Omega$ $\Omega$	$V_{GS}=4.5\text{V}, I_D=11\text{A}$ $V_{GS}=2.5\text{V}, I_D=5\text{A}$
Forward Transconductance (3)	$g_{fs}$		40		S	$V_{DS}=10\text{V}, I_D=6\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		2300		pF	$V_{DS}=15\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$		450		pF	
Reverse Transfer Capacitance	$C_{rss}$		260		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		6.3		ns	$V_{DD}=10\text{V}, I_D=6\text{A}$ $R_G=6.0\Omega, V_{GS}=5\text{V}$
Rise Time	$t_r$		8.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		25		ns	
Fall Time	$t_f$		5		ns	
Gate Charge	$Q_g$		19.4		nC	$V_{DS}=15\text{V}, V_{GS}=5\text{V},$ $I_D=3.5\text{A}$
Total Gate Charge	$Q_g$		24		nC	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V},$ $I_D=6\text{A}$
Gate-Source Charge	$Q_{gs}$		5		nC	
Gate-Drain Charge	$Q_{gd}$		4		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$		TBA?	0.95	V	$T_j=25^\circ\text{C}, I_s=5.1\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		15		ns	$T_j=25^\circ\text{C}, I_f=6\text{A},$ $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		5		nC	

### NOTES

- (1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . 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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## 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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