

# ZXMN3A04DN8

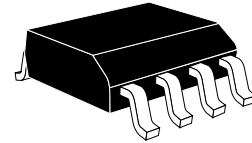
## DUAL 30V N-CANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

$V_{(BR)DSS} = 30V$ ;  $R_{DS(ON)} = 0.02\Omega$ ;  $I_D = 8.5A$

### 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.



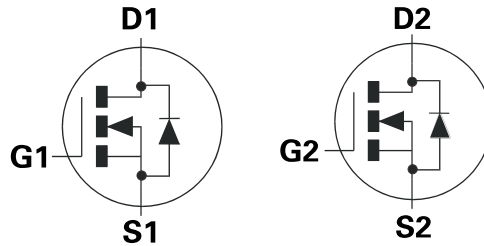
SO8

### 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



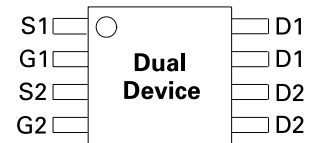
### ORDERING INFORMATION

DEVICE	REEL	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A04DN8TA	7"	12mm	500 units
ZXMN3A04DN8TC	13"	12mm	2500 units

### DEVICE MARKING

ZXMN  
3A04D

### PINOUT



Top view

# ZXMN3A04DN8

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	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)	$I_D$	8.5 6.8 6.5	A
Pulsed Drain Current (c)	$I_{DM}$	39	A
Continuous Source Current (Body Diode) (b)	$I_S$	3.6	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	39	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	$P_D$	2.15 17.2	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 (b)(e)	$R_{\theta JA}$	69	$^\circ C/W$
Junction to Ambient (b)(d)	$R_{\theta JA}$	58	$^\circ C/W$

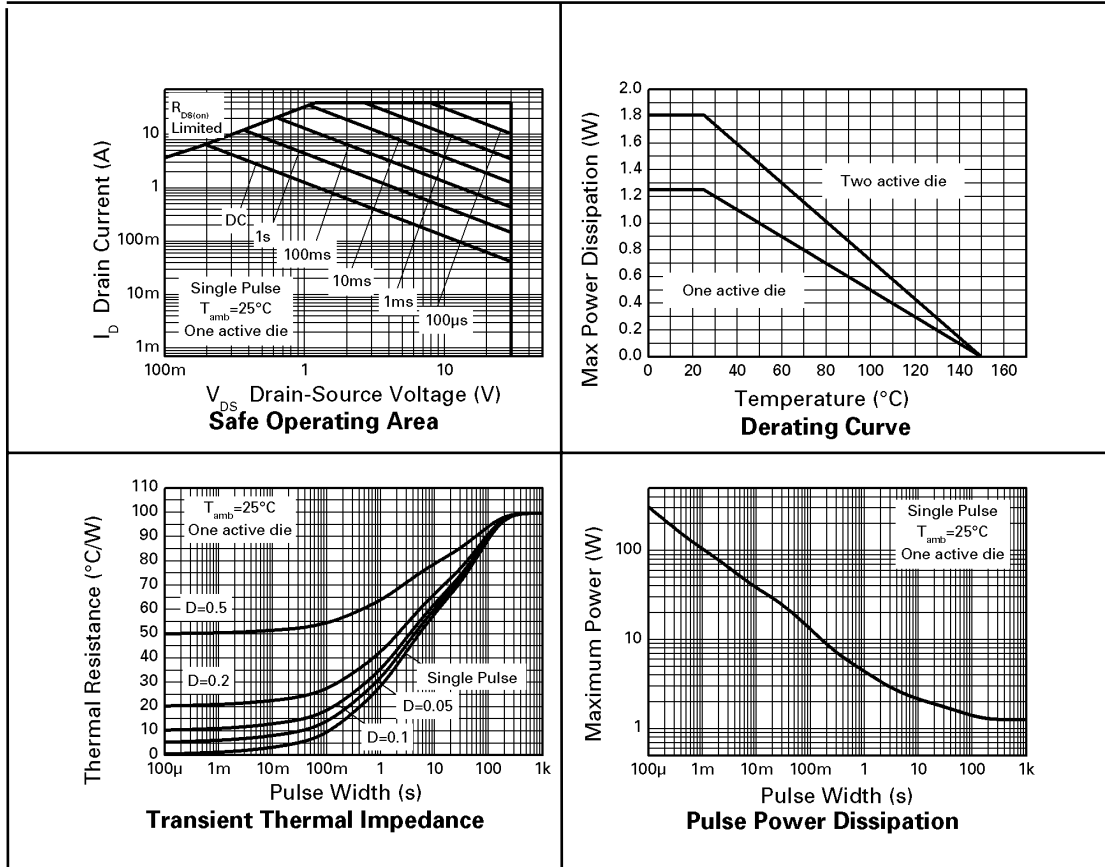
### Notes

- (a) For a dual device surface mounted on 25mm x 25mm FR4 PCB with coverage of single sided 1oz copper in still air conditions.  
 (b) For a dual 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 $\mu s$  - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance Graph.  
 (d) For a dual device with one active die.



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## CHARACTERISTICS



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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	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			0.5	$\mu\text{A}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
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)	$R_{DS(on)}$			0.02 0.03	$\Omega$ $\Omega$	$V_{GS}=10\text{V}, I_D=12.6\text{A}$ $V_{GS}=4.5\text{V}, I_D=10.6\text{A}$
Forward Transconductance (3)	$g_{fs}$		22.1		S	$V_{DS}=15\text{V}, I_D=12.6\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		1890		pF	$V_{DS}=15\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$
Output Capacitance	$C_{oss}$		349		pF	
Reverse Transfer Capacitance	$C_{rss}$		218		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		5.2		ns	$V_{DD}=15\text{V}, I_D=1\text{A}$ $R_G=6.0\Omega, V_{GS}=10\text{V}$
Rise Time	$t_r$		6.1		ns	
Turn-Off Delay Time	$t_{d(off)}$		38.1		ns	
Fall Time	$t_f$		20.2		ns	
Gate Charge	$Q_g$		19.9		nC	$V_{DS}=15\text{V}, V_{GS}=5\text{V}, I_D=6.5\text{A}$
Total Gate Charge	$Q_g$		36.8		nC	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=6.5\text{A}$
Gate-Source Charge	$Q_{gs}$		5.8		nC	
Gate-Drain Charge	$Q_{gd}$		7.1		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$		0.85	0.95	V	$T_J=25^\circ\text{C}, I_S=6.8\text{A}, V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		18.4		ns	$T_J=25^\circ\text{C}, I_F=2.3\text{A}, di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		11		nC	

**NOTES**

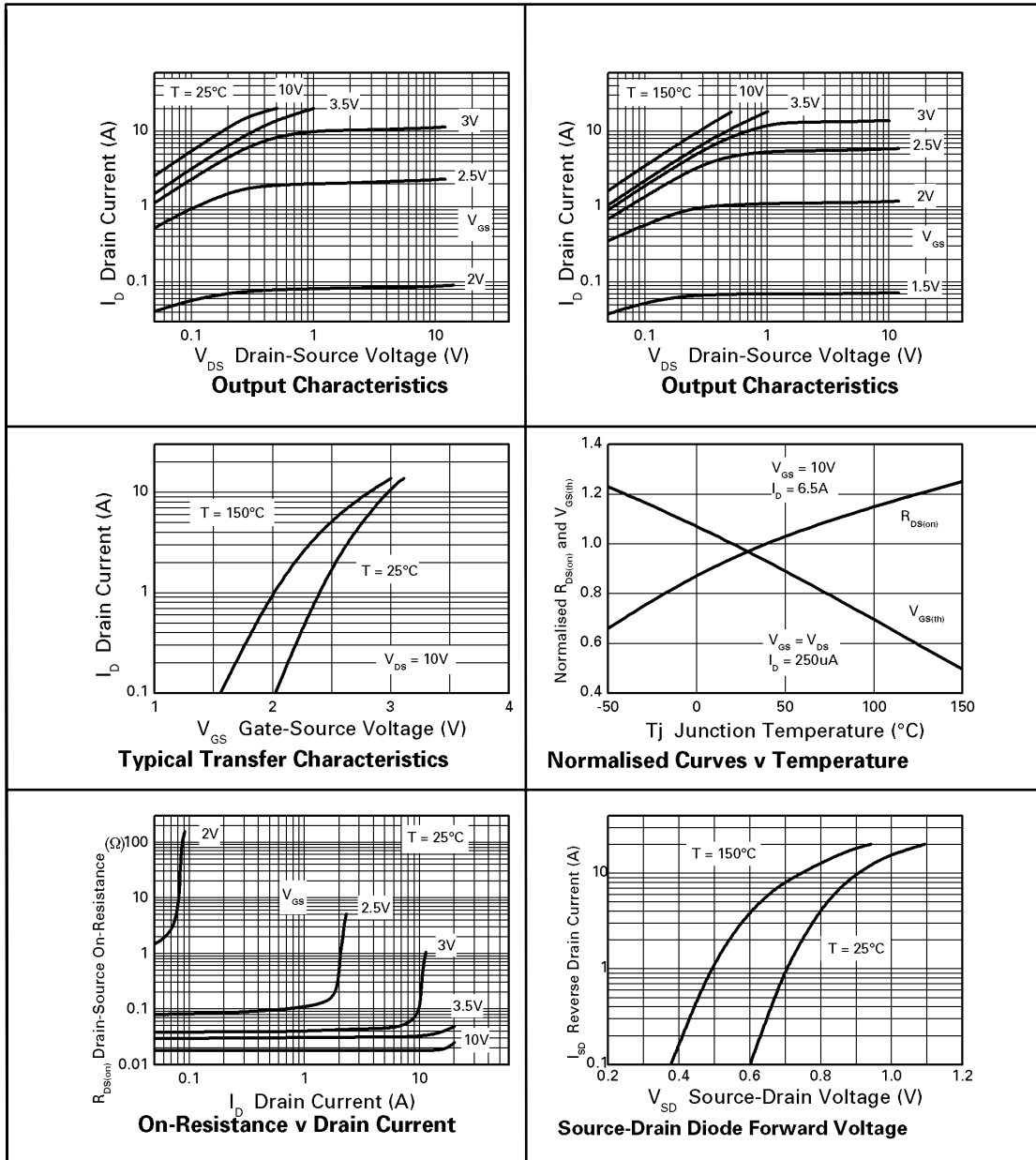
- (1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$  .  
 (2) Switching characteristics are independent of operating junction temperature.  
 (3) For design aid only, not subject to production testing.



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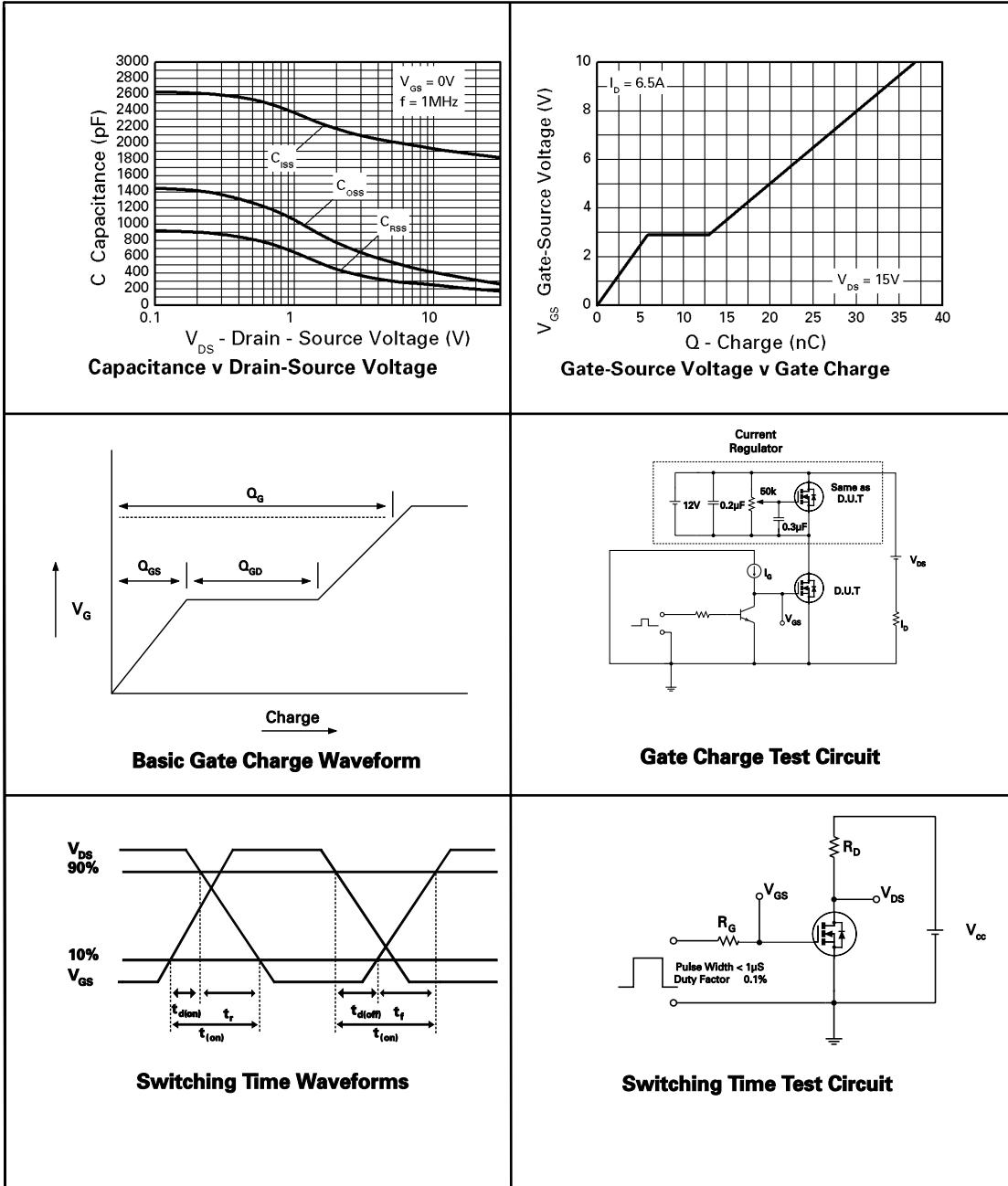
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## TYPICAL CHARACTERISTICS



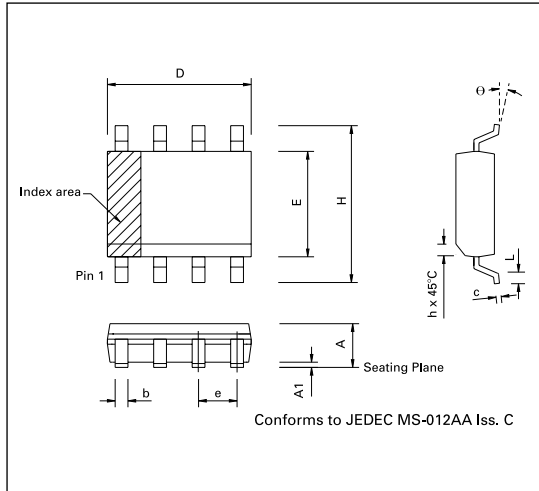
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## TYPICAL CHARACTERISTICS



# ZXMN3A04DN8

## PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES  
APPROX IN MILLIMETRES

## PACKAGE DIMENSIONS

DIM	INCHES		MILLIMETRES	
	MIN	MAX	MIN	MAX
A	0.053	0.069	1.35	1.75
A1	0.004	0.010	0.10	0.25
D	0.189	0.197	4.80	5.00
H	0.228	0.244	5.80	6.20
E	0.150	0.157	3.80	4.00
L	0.016	0.050	0.40	1.27
e	0.050 BSC		1.27 BSC	
b	0.013	0.020	0.33	0.51
c	0.008	0.010	0.19	0.25
θ	0°	8°	0°	8°
h	0.010	0.020	0.25	0.50

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