

ZXMN2A04DN8

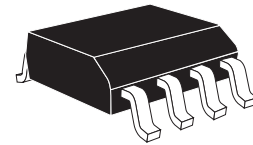
DUAL 20V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 20V$; $R_{DS(ON)} = 0.025\Omega$; $I_D = 7.7A$

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.



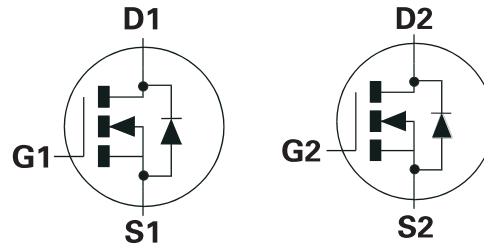
SO8

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



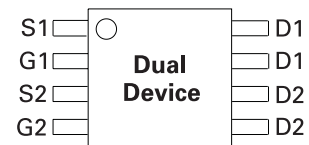
ORDERING INFORMATION

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

DEVICE MARKING

ZXMN
2A04D

PINOUT



Top view

ZXMN2A04DN8

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate Source Voltage	V_{GS}	± 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	7.7	A
		6.2	A
		5.9	A
Pulsed Drain Current ^(c)	I_{DM}	38	A
Continuous Source Current (Body Diode) ^(b)	I_S	2.9	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	38	A
Power Dissipation at $T_A=25^\circ C$ ^{(a) (d)}	P_D	1.25	W
Linear Derating Factor		10	mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ ^{(a) (e)}	P_D	1.8	W
Linear Derating Factor		14	mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ ^{(b) (d)}	P_D	2.1	W
Linear Derating Factor		17	mW/ $^\circ C$
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^\circ C$

THERMAL RESISTANCE

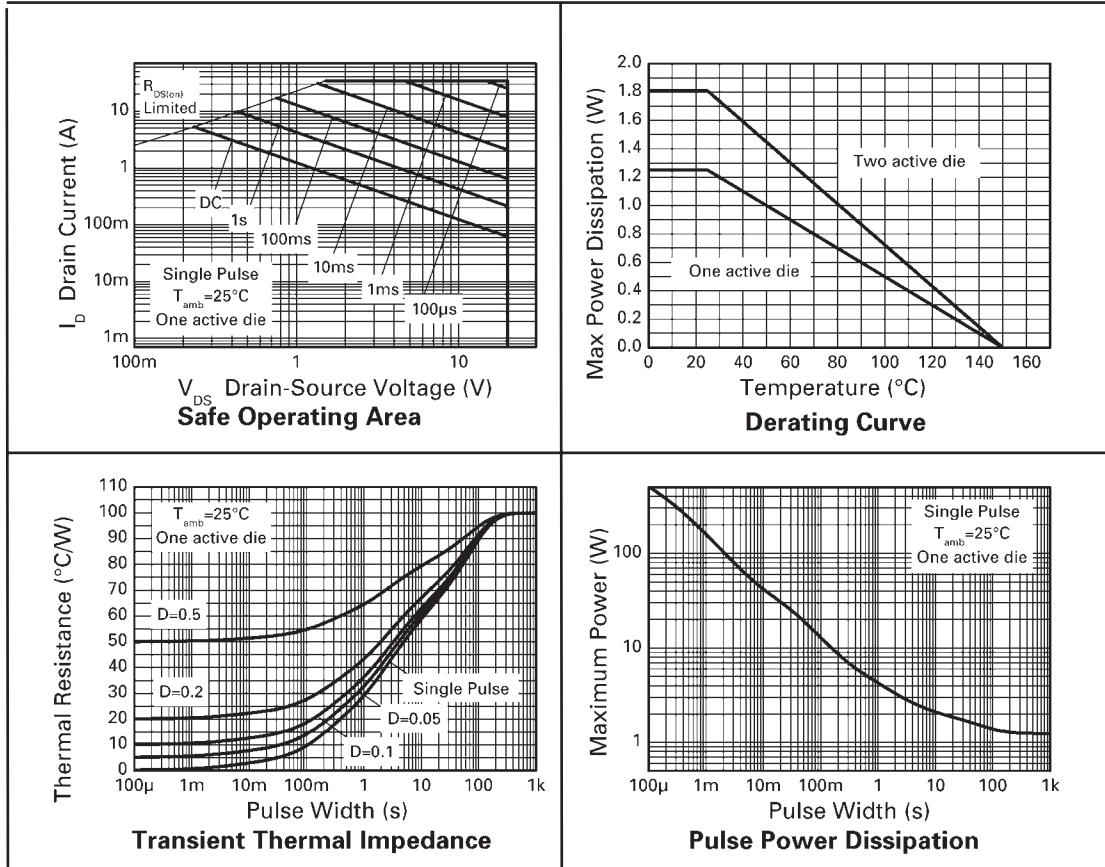
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient ^{(a) (d)}	$R_{\theta JA}$	100	$^\circ C/W$
Junction to Ambient ^{(b) (e)}	$R_{\theta JA}$	70	$^\circ C/W$
Junction to Ambient ^{(b) (d)}	$R_{\theta JA}$	60	$^\circ C/W$

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 μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance Graph.
- (d) For a dual device with one active die.
- (e) For dual device with 2 active die running at equal power.

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CHARACTERISTICS



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

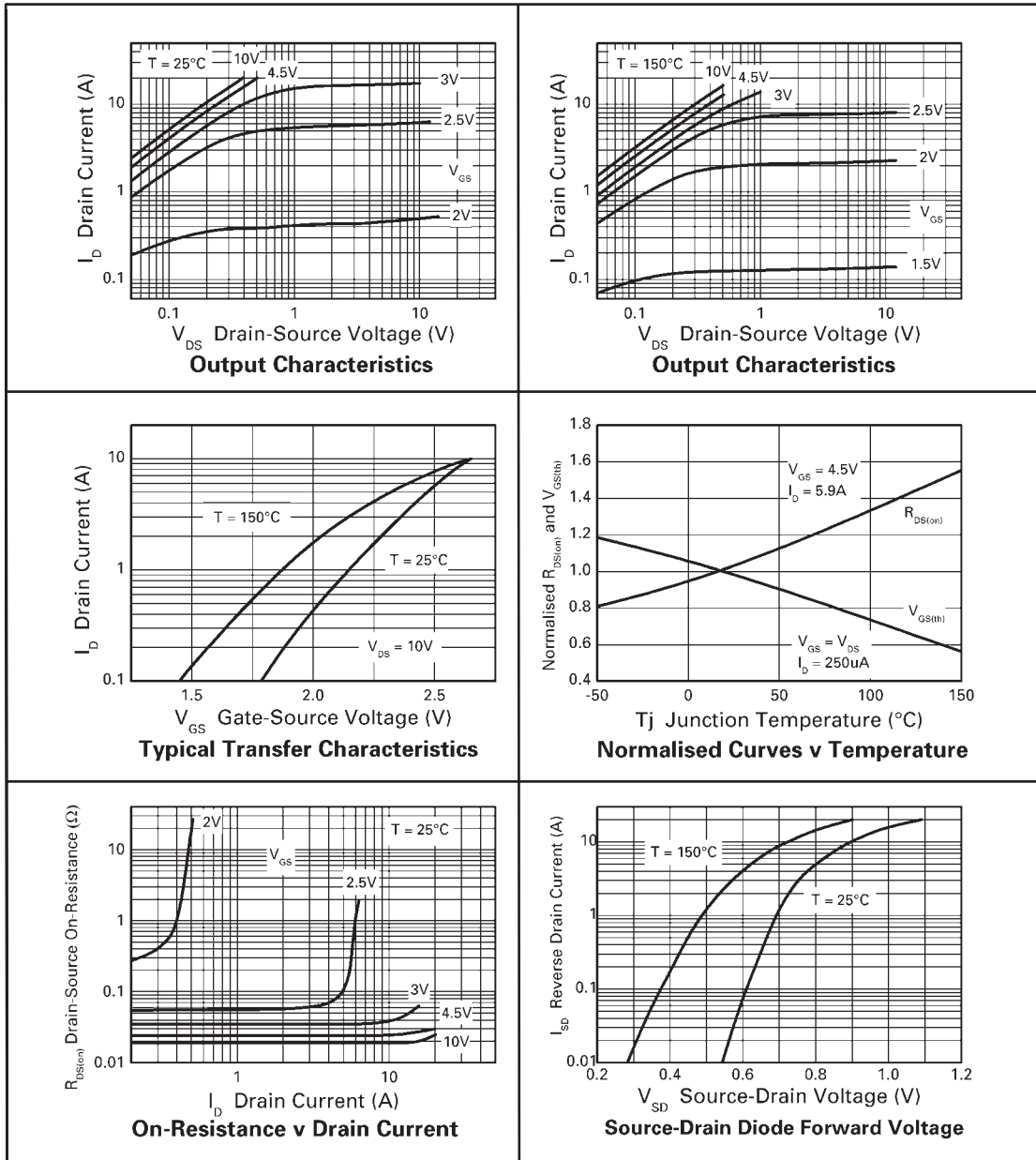
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			0.5	μA	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
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⁾	$R_{DS(on)}$			0.025	Ω	$V_{GS}=4.5\text{V}, I_D=5.9\text{A}$
				0.035	Ω	$V_{GS}=2.5\text{V}, I_D=5\text{A}$
Forward Transconductance ⁽³⁾	g_{fs}		40		S	$V_{DS}=10\text{V}, I_D=5.9\text{A}$
DYNAMIC ⁽³⁾						
Input Capacitance	C_{ISS}		1880		pF	$V_{DS}=10\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	C_{OSS}		506		pF	
Reverse Transfer Capacitance	C_{RSS}		386		pF	
SWITCHING ^{(2) (3)}						
Turn-On Delay Time	$t_{d(on)}$		7.9		ns	$V_{DD}=10\text{V}, I_D=1\text{A}$ $R_G=6\Omega, V_{GS}=5\text{V}$
Rise Time	t_r		14.8		ns	
Turn-Off Delay Time	$t_{d(off)}$		50.5		ns	
Fall Time	t_f		30.6		ns	
Gate Charge	Q_g		22.1		nC	$V_{DS}=15\text{V}, V_{GS}=5\text{V},$ $I_D=3.5\text{A}$
Total Gate Charge	Q_g		40.5		nC	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V},$ $I_D=5.9\text{A}$
Gate-Source Charge	Q_{gs}		5.6		nC	
Gate-Drain Charge	Q_{gd}		8.0		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V_{SD}		0.85	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}		18.0		ns	$T_J=25^\circ\text{C}, I_F=1.9\text{A},$
Reverse Recovery Charge ⁽³⁾	Q_{rr}		8.9		nC	$di/dt= 100\text{A}/\mu\text{s}$

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.

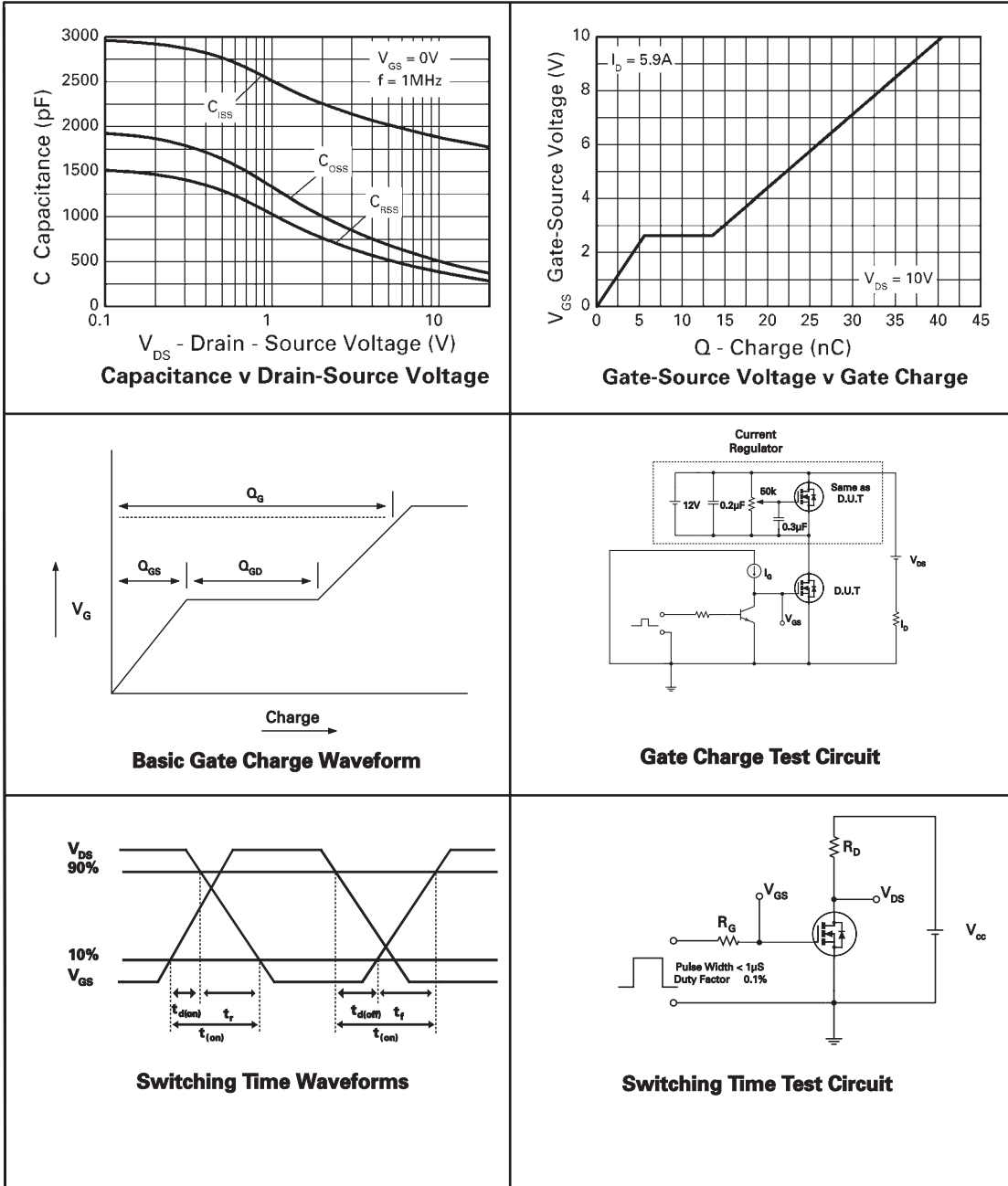
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TYPICAL CHARACTERISTICS



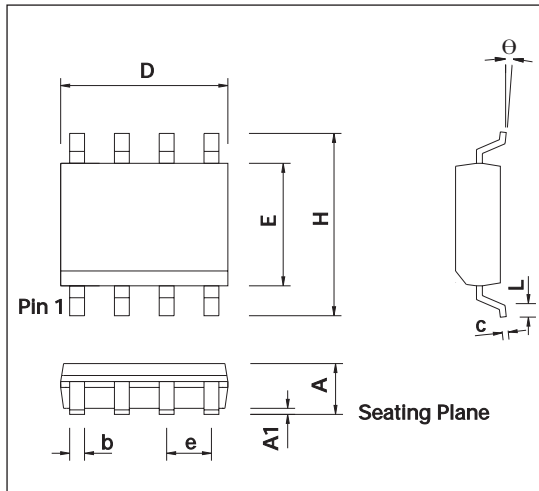
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TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES
APPROX IN MILLIMETRES

PACKAGE DIMENSIONS

DIM	INCHES		MILLIMETERS	
	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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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA	Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex plc Lansdowne Road, Chadderton Oldham, OL9 9TY United Kingdom
Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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