

ZXMN3B04N8

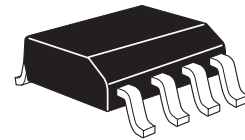
30V N-CHANNEL ENHANCEMENT MODE MOSFET 2.5V GATE DRIVE

SUMMARY

$V_{(BR)DSS}=30V$; $R_{DS(on)}=0.025\Omega$; $I_D= 8.9A$

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.



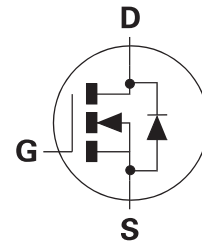
SO8

FEATURES

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

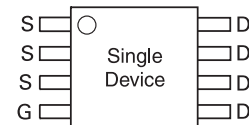
APPLICATIONS

- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control



ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3B04N8TA	7"	12mm	500 units
ZXMN3B04N8TC	13"	12mm	2500 units



Top View

DEVICE MARKING

- ZXMN
3B04

ISSUE 2 - MAY 2004

ZXMN3B04N8

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V_{DSS}	30	V
Gate source voltage	V_{GS}	± 12	V
Continuous drain current @ $V_{GS}=4.5V$; $T_A=25^\circ C$ ^(b) @ $V_{GS}=4.5V$; $T_A=70^\circ C$ ^(b) @ $V_{GS}=4.5V$; $T_A=25^\circ C$ ^(a)	I_D	8.9	A
		7.3	A
		7.2	A
Pulsed drain current ^(c)	I_{DM}	45	A
Continuous source current (body diode) ^(b)	I_S	4.5	A
Pulsed source current (body diode) ^(c)	I_{SM}	45	A
Power dissipation at $T_A=25^\circ C$ ^(a)	P_D	2	W
Linear derating factor		16	mW/ $^\circ C$
Power dissipation at $T_A=25^\circ C$ ^(b)	P_D	3	W
Linear derating factor		24	mW/ $^\circ C$
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	$^\circ C$

THERMAL RESISTANCE

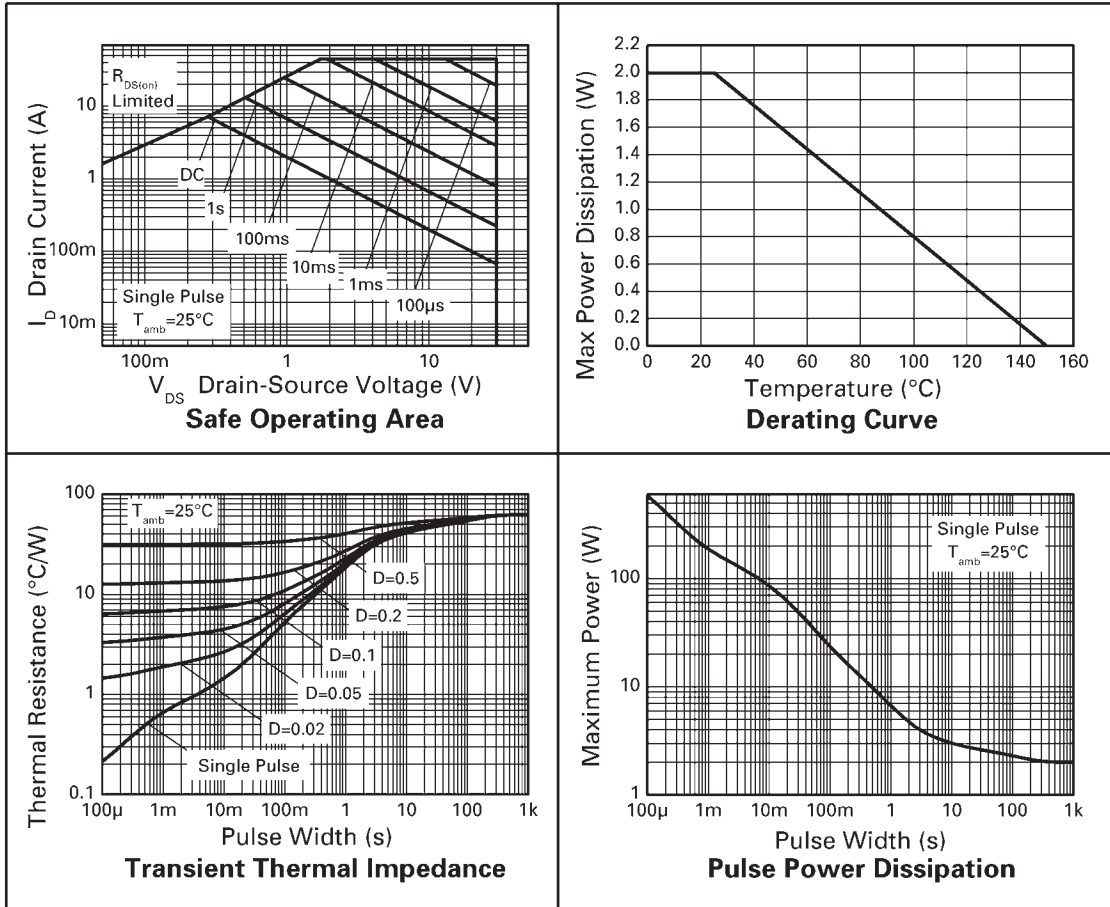
PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to ambient ^(b)	$R_{\theta JA}$	41.4	$^\circ C/W$

NOTES

- (a) For a device surface mounted on 50mm x 50mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
(b) For a 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.

ZXMN3B04N8

CHARACTERISTICS



ZXMN3B04N8

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

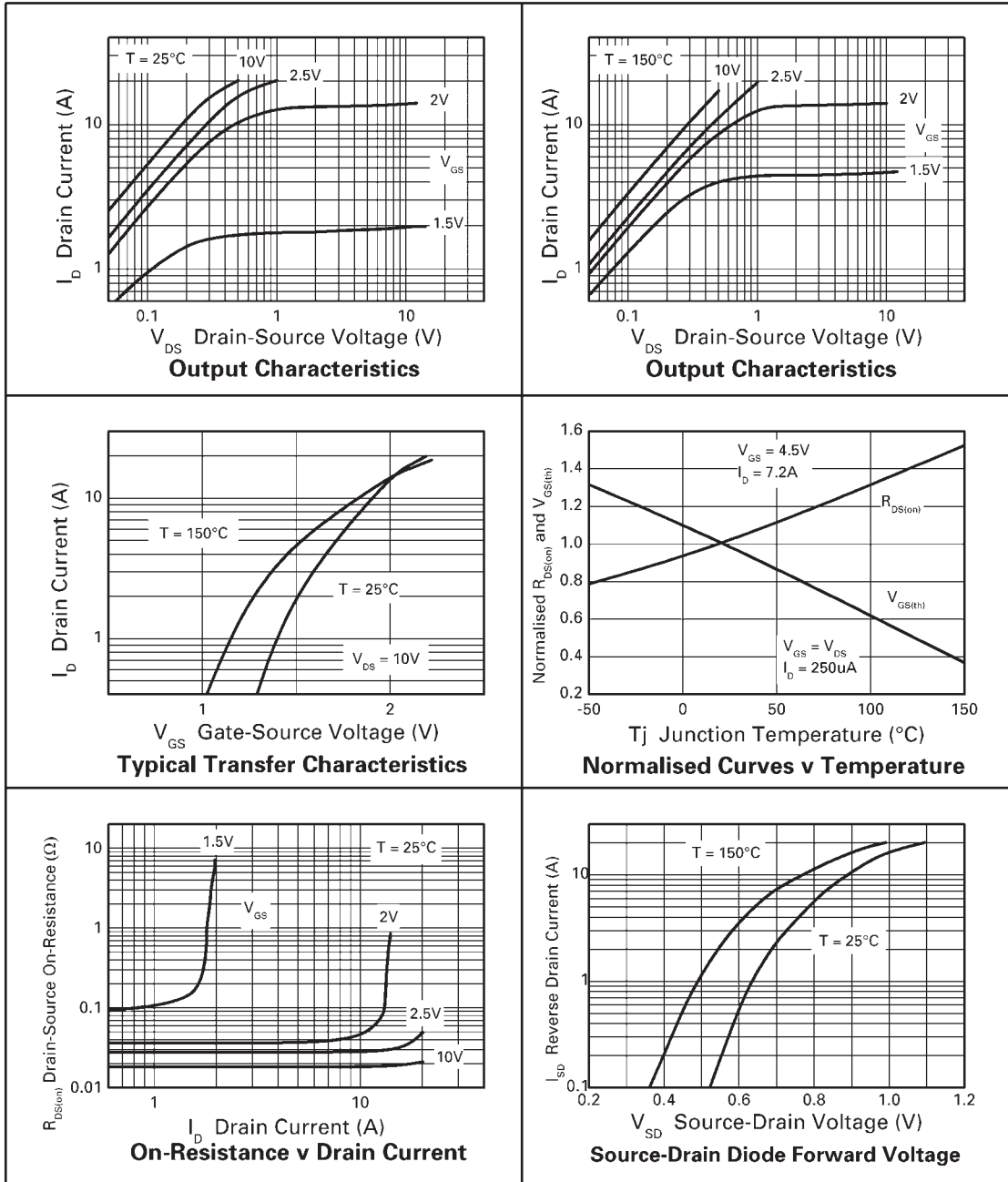
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-source breakdown voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero gate voltage drain current	I_{DSS}			0.5	μA	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
Gate-body leakage	I_{GSS}			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
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⁾	$R_{DS(on)}$		0.021	0.025	Ω	$V_{GS}=4.5\text{V}, I_D=7.2\text{A}$
			0.028	0.040	Ω	$V_{GS}=2.5\text{V}, I_D=5.7\text{A}$
Forward transconductance ^{(1) (3)}	g_{fs}		24		S	$V_{DS}=15\text{V}, I_D=7.2\text{A}$
DYNAMIC ⁽³⁾						
Input capacitance	C_{iss}		2480		pF	$V_{DS}=15\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output capacitance	C_{oss}		318		pF	
Reverse transfer capacitance	C_{rss}		184		pF	
SWITCHING ^{(2) (3)}						
Turn-on delay time	$t_{d(on)}$		9		ns	$V_{DD}=15\text{V}, V_{GS}=4.5\text{V}$ $I_D=1\text{A}$ $R_G=6.0\Omega,$
Rise time	t_r		11.5		ns	
Turn-off delay time	$t_{d(off)}$		40		ns	
Fall time	t_f		16.6		ns	
Total gate charge	Q_g		23.1		nC	$V_{DS}=15\text{V}, V_{GS}=4.5\text{V},$ $I_D=7.2\text{A}$
Gate-source charge	Q_{gs}		4.9		nC	
Gate-drain charge	Q_{gd}		6.2		nC	
SOURCE-DRAIN DIODE						
Diode forward voltage ⁽¹⁾	V_{SD}		0.85	0.95	V	$T_J=25^{\circ}\text{C}, I_S=8\text{A},$ $V_{GS}=0\text{V}$
Reverse recovery time ⁽³⁾	t_{rr}		17.9		ns	$T_J=25^{\circ}\text{C}, I_F=3.2\text{A},$
Reverse recovery charge ⁽³⁾	Q_{rr}		10		nC	$di/dt=100\text{A}/\mu\text{s}$

NOTES

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

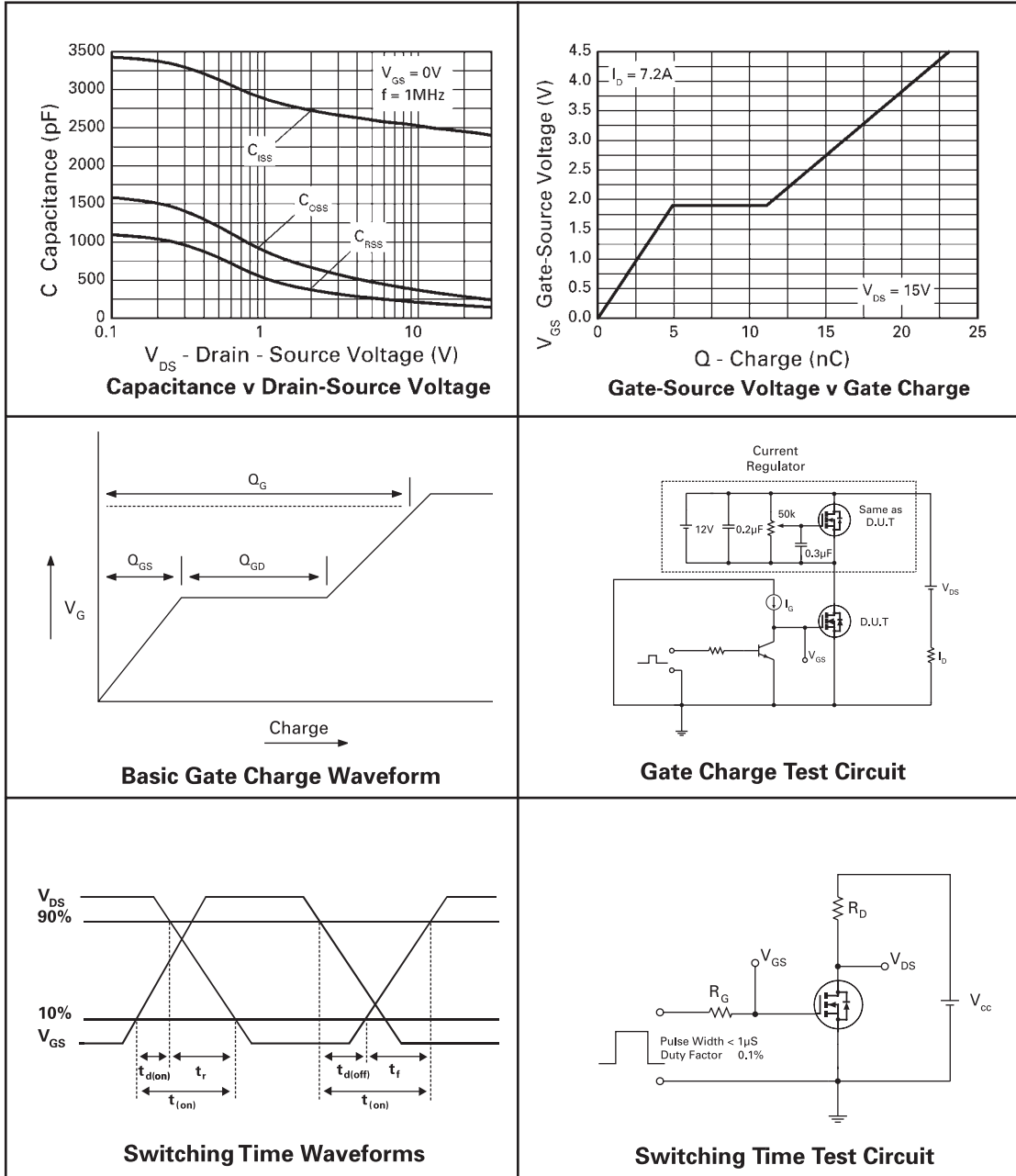
ZXMN3B04N8

TYPICAL CHARACTERISTICS



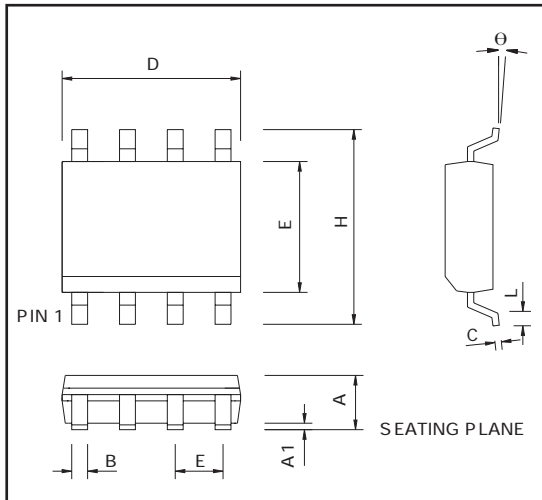
ZXMN3B04N8

TYPICAL CHARACTERISTICS



ZXMN3B04N8

PACKAGE OUTLINE



Controlling dimensions are in inches. Approximate conversions are given in millimeters

PACKAGE DIMENSIONS

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

© Zetex Semiconductors plc 2004

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

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

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.

For the latest product information, log on to www.zetex.com

ISSUE 2 - MAY 2004