

ZXMN3B04N8

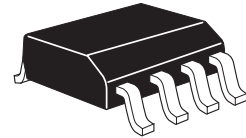
30V N-CANNEL ENHANCEMENT MODE MOSFET 2.5V GATE DRIVE

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.



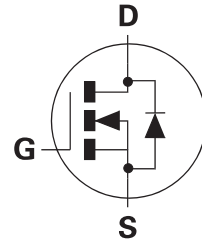
SO8

FEATURES

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

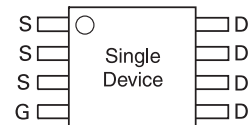
APPLICATIONS

- 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

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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)	I_D	8.9	A
@ $V_{GS}=4.5V$; $T_A=70^\circ C$ ^(b)		7.3	A
@ $V_{GS}=4.5V$; $T_A=25^\circ C$ ^(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

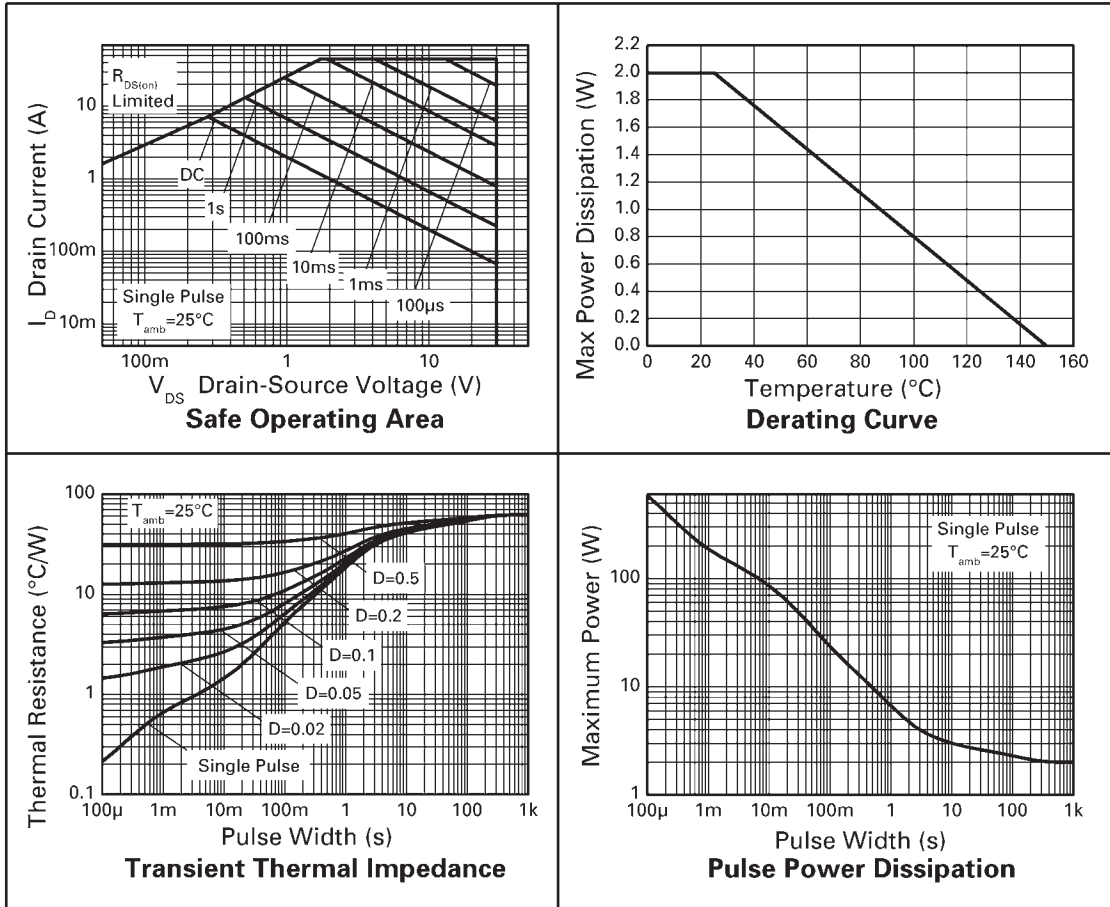
PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to ambient ^(b)	$R_{\theta JA}$	41.4	$^\circ C/W$

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.

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CHARACTERISTICS



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

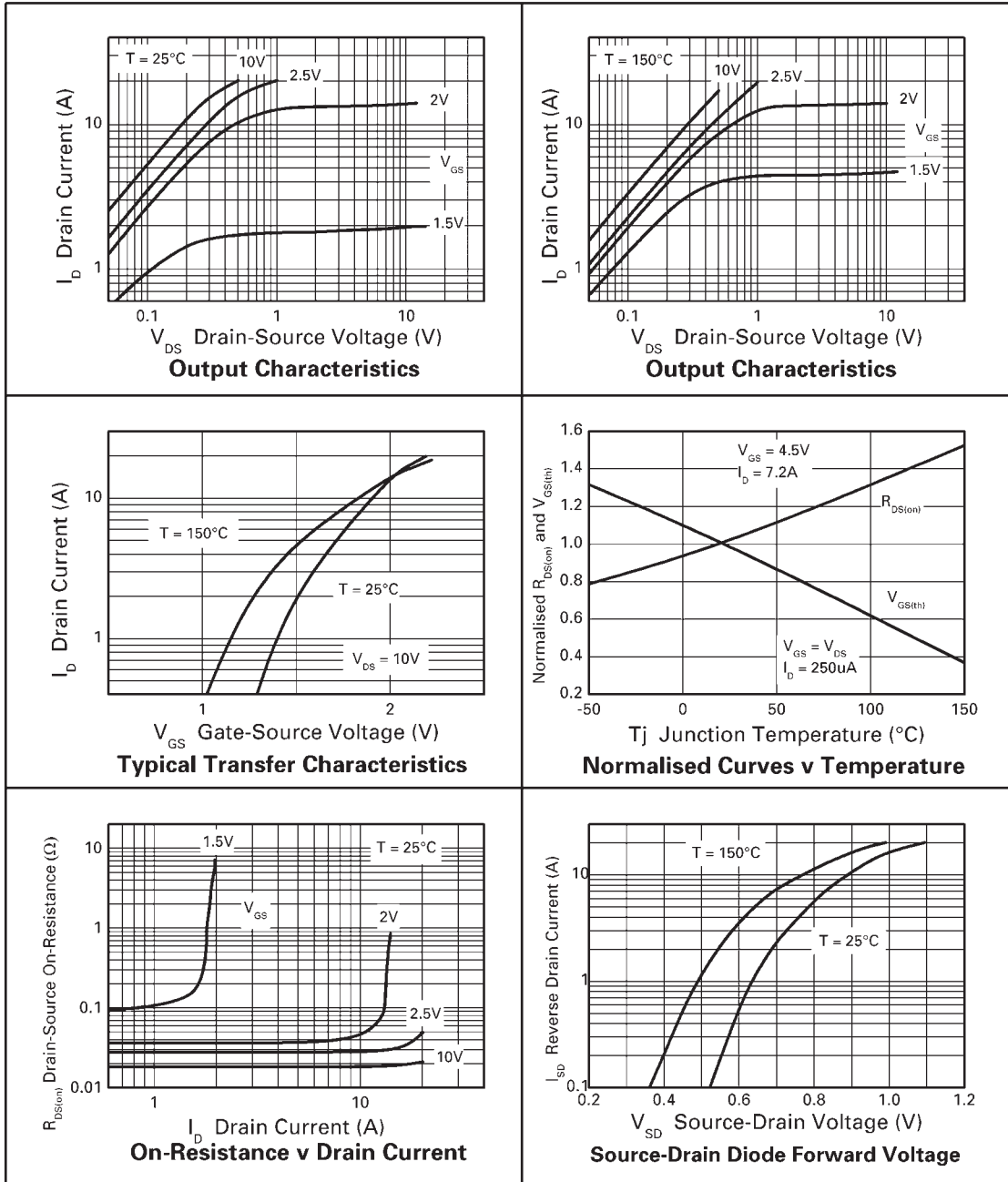
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-source breakdown voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero gate voltage drain current	I_{DSS}			0.5	μA	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
Gate-body leakage	I_{GSS}			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
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.

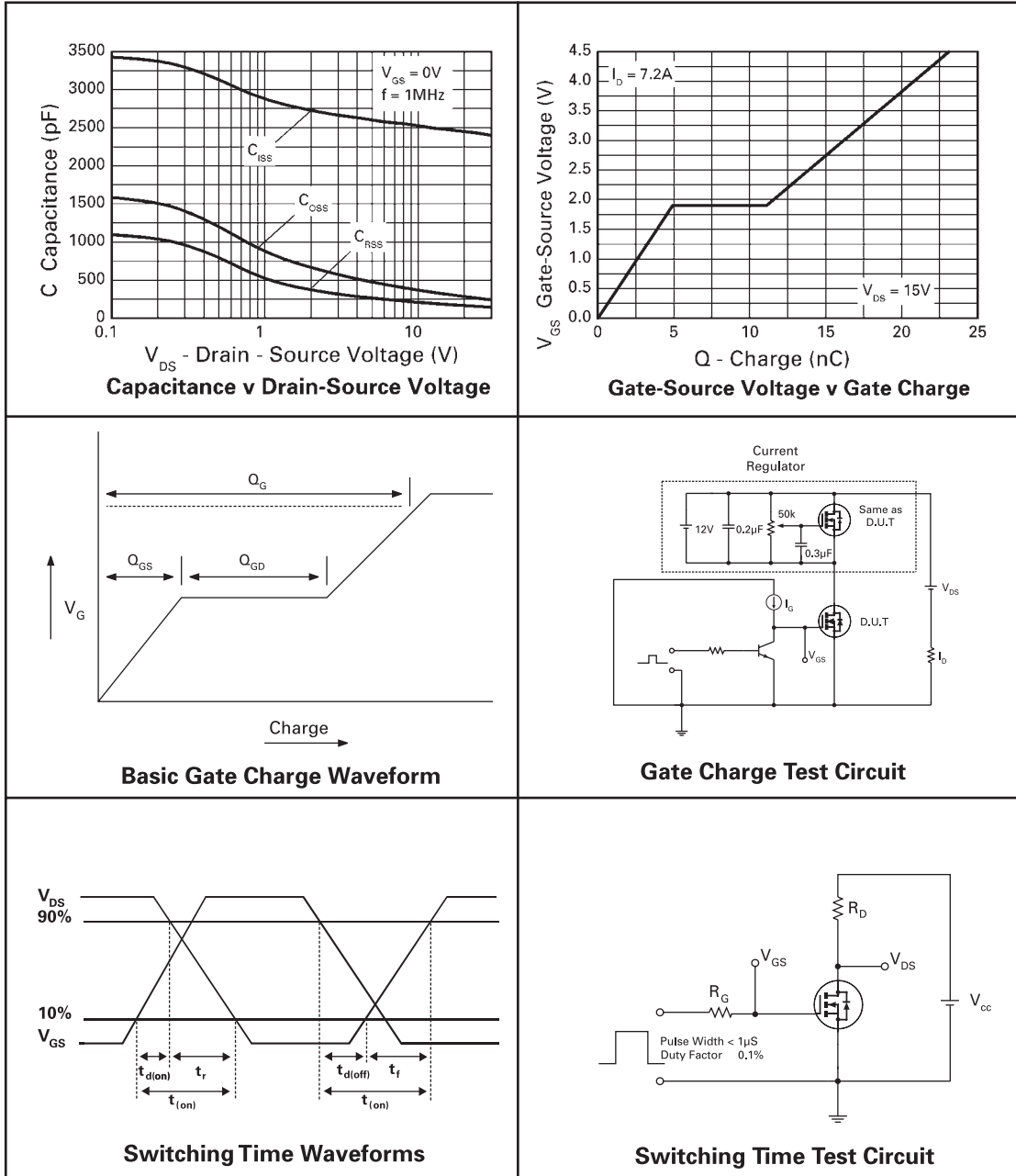
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TYPICAL CHARACTERISTICS



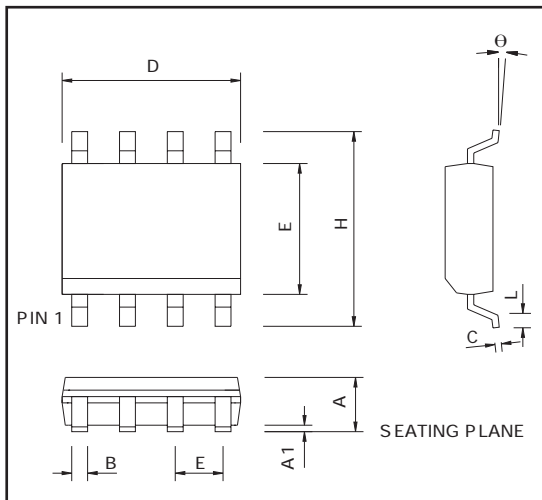
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TYPICAL CHARACTERISTICS



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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					

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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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ISSUE 2 - MAY 2004