

# ZXMN3B04N8

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

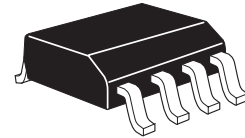
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### SUMMARY

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

### 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.



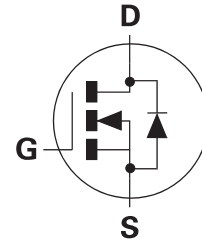
SO8

### FEATURES

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

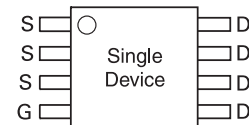
### APPLICATIONS

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

## THERMAL RESISTANCE

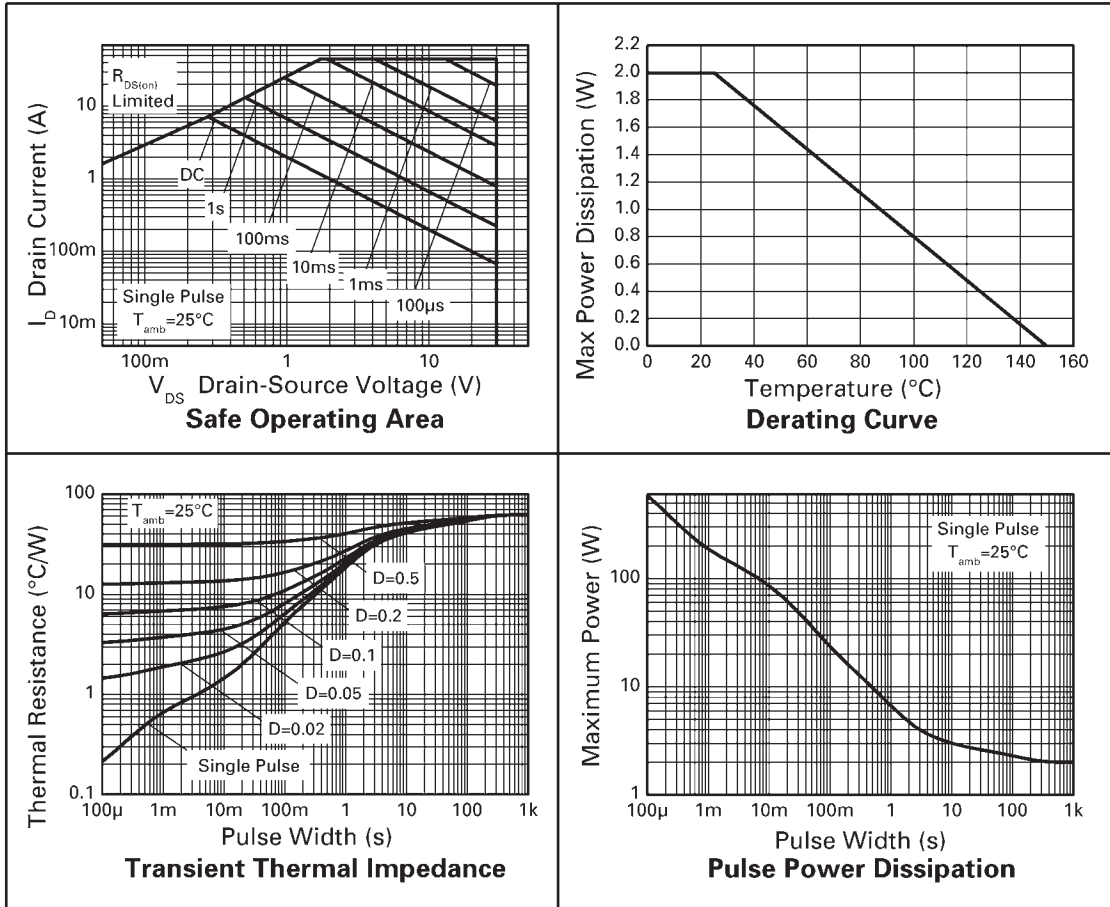
PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	41.4	$^\circ C/W$

### 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 $\mu s$  - 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)

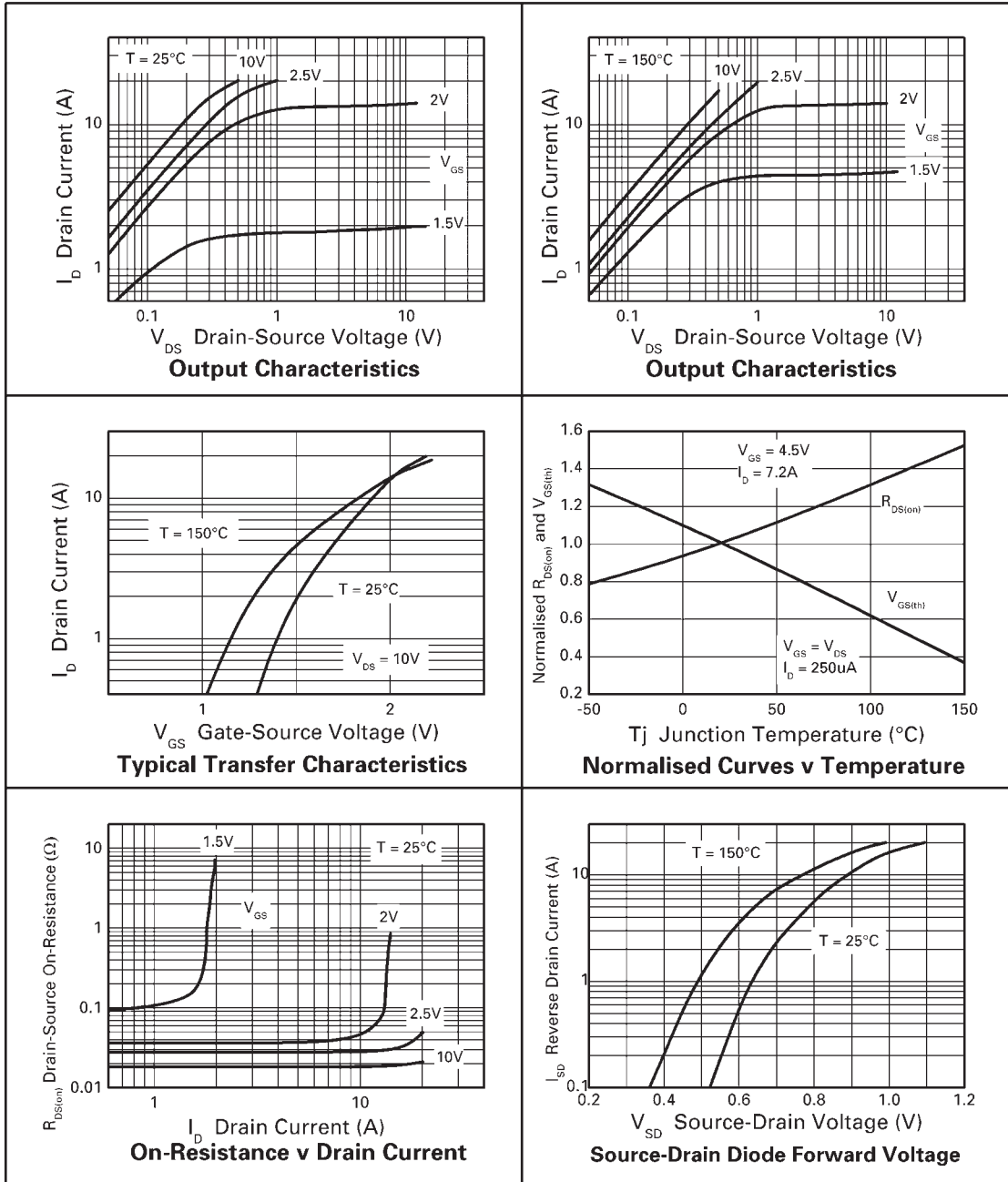
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
<b>STATIC</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero gate voltage drain current	$I_{DSS}$			0.5	$\mu\text{A}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
Gate-body leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
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 <sup>(1)</sup>	$R_{DS(on)}$		0.021	0.025	$\Omega$	$V_{GS}=4.5\text{V}, I_D=7.2\text{A}$
			0.028	0.040	$\Omega$	$V_{GS}=2.5\text{V}, I_D=5.7\text{A}$
Forward transconductance <sup>(1) (3)</sup>	$g_{fs}$		24		S	$V_{DS}=15\text{V}, I_D=7.2\text{A}$
<b>DYNAMIC</b> <sup>(3)</sup>						
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	
<b>SWITCHING</b> <sup>(2) (3)</sup>						
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	
<b>SOURCE-DRAIN DIODE</b>						
Diode forward voltage <sup>(1)</sup>	$V_{SD}$		0.85	0.95	V	$T_J=25^{\circ}\text{C}, I_S=8\text{A},$ $V_{GS}=0\text{V}$
Reverse recovery time <sup>(3)</sup>	$t_{rr}$		17.9		ns	$T_J=25^{\circ}\text{C}, I_F=3.2\text{A},$
Reverse recovery charge <sup>(3)</sup>	$Q_{rr}$		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.

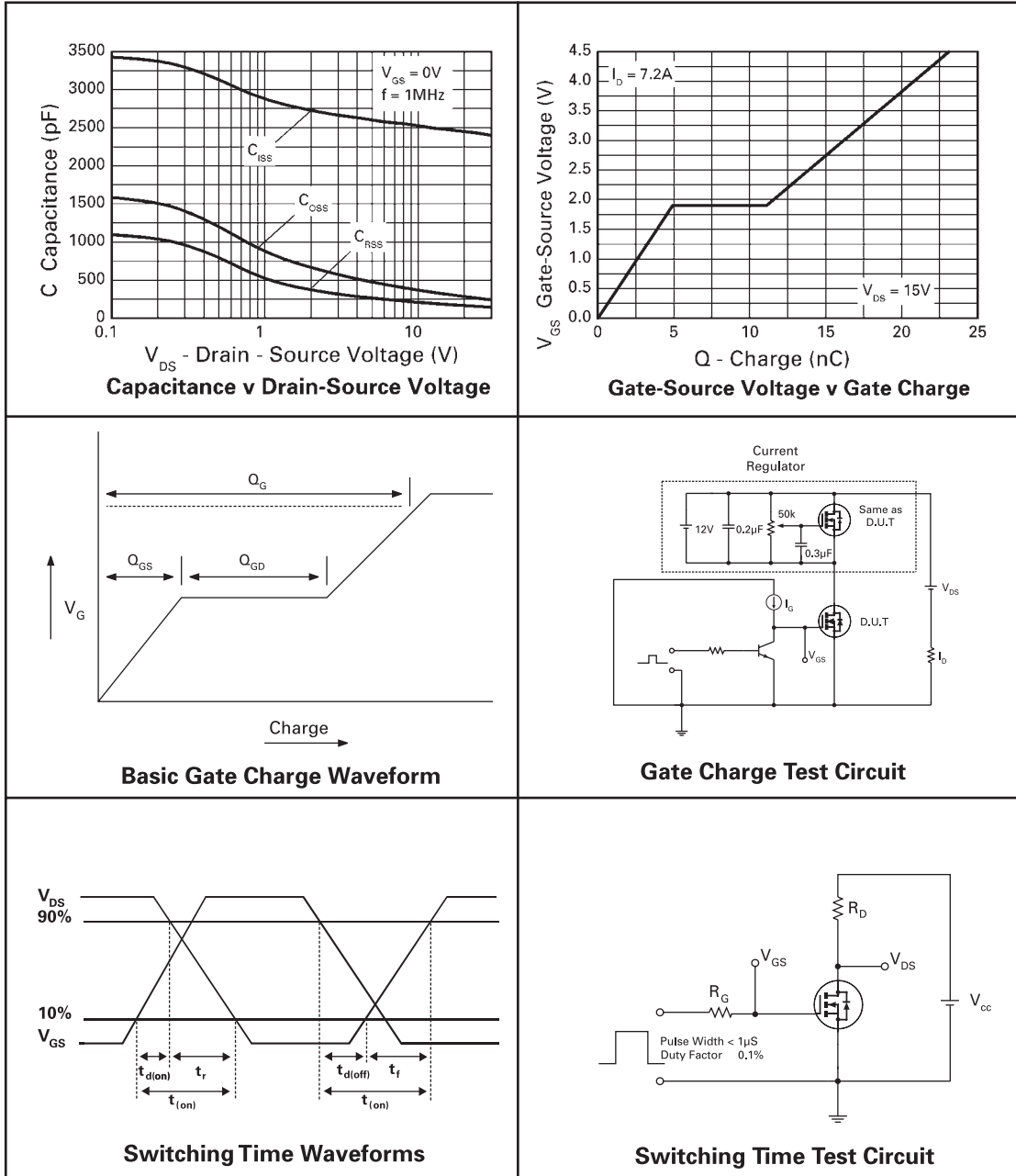
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## TYPICAL CHARACTERISTICS



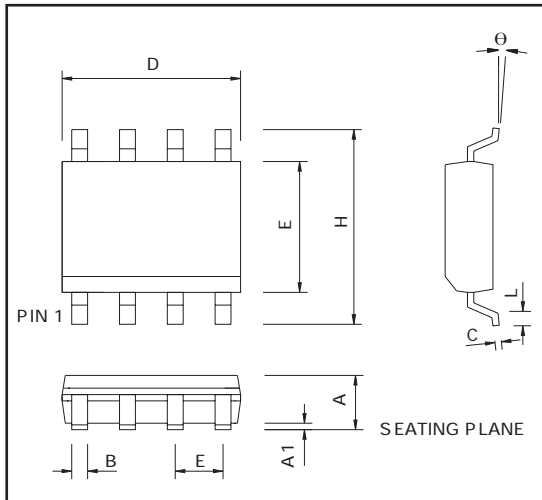
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## TYPICAL CHARACTERISTICS



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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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