

# ZXMN3A02X8

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## 30V N-CHANNEL ENHANCEMENT MODE MOSFET

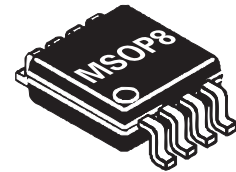
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### SUMMARY

$V_{(BR)DSS}=30V$ ;  $R_{DS(ON)}=0.025\Omega$   $I_D=6.7A$

### 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.

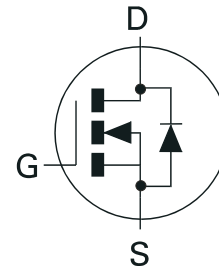


### FEATURES

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

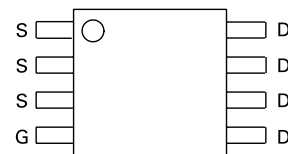
### APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control



### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A02X8TA	7"	12mm	1000 units
ZXMN3A02X8TC	13"	12mm	4000 units



Top View

### DEVICE MARKING

- ZXMN  
3A02

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## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current V <sub>GS</sub> =10V; T <sub>A</sub> =25°C (b) V <sub>GS</sub> =10V; T <sub>A</sub> =70°C (b) V <sub>GS</sub> =10V; T <sub>A</sub> =25°C (a)	I <sub>D</sub>	6.7 5.4 5.3	A
Pulsed Drain Current (c)	I <sub>DM</sub>	24	A
Continuous Source Current (Body Diode) (b)	I <sub>S</sub>	3.2	A
Pulsed Source Current (Body Diode) (c)	I <sub>SM</sub>	24	A
Power Dissipation at T <sub>A</sub> =25°C (a) Linear Derating Factor	P <sub>D</sub>	1.1 8.8	W mW/°C
Power Dissipation at T <sub>A</sub> =25°C (b) Linear Derating Factor	P <sub>D</sub>	1.8 14.4	W mW/°C
Operating and Storage Temperature Range	T <sub>j</sub> :T <sub>stg</sub>	-55 to +150	°C

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	R <sub>θJA</sub>	113	°C/W
Junction to Ambient (b)	R <sub>θJA</sub>	70	°C/W

## NOTES

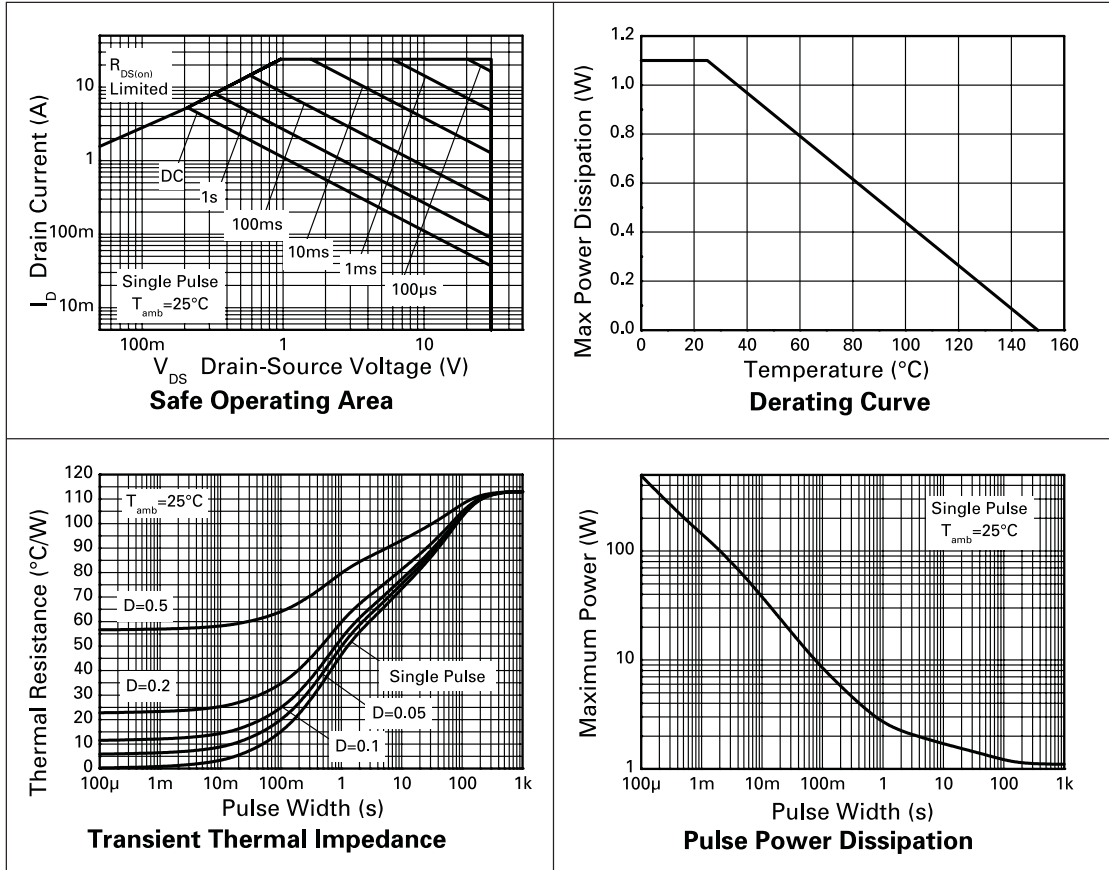
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at t ≤ 10 secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D = 0.05, pulse width 10μs - pulse width limited by maximum junction temperature.

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## CHARACTERISTICS



\* For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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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	$I_{DSS}$			1	$\mu\text{A}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
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			V	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.025 0.035	$\Omega$ $\Omega$	$V_{GS}=10\text{V}, I_D=12\text{A}$ $V_{GS}=4.5\text{V}, I_D=10.2\text{A}$
Forward Transconductance (1)(3)	$g_{fs}$		22		S	$V_{DS}=10\text{V}, I_D=12\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		1400		pF	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$		209		pF	
Reverse Transfer Capacitance	$C_{rss}$		120		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		3.9		ns	$V_{DD}=15\text{V}, I_D=5.5\text{A}$ $R_G=6.2\Omega, V_{GS}=10\text{V}$ (refer to test circuit)
Rise Time	$t_r$		5.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		35.0		ns	
Fall Time	$t_f$		7.6		ns	
Gate Charge	$Q_g$		14.5		nC	$V_{DS}=15\text{V}, V_{GS}=5\text{V},$ $I_D=5.5\text{A}$ (refer to test circuit)
Total Gate Charge	$Q_g$		26.8		nC	$V_{DS}=15\text{V}, V_{GS}=10\text{V},$ $I_D=5.5\text{A}$ (refer to test circuit)
Gate-Source Charge	$Q_{gs}$		4.7		nC	
Gate-Drain Charge	$Q_{gd}$		4.7		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			0.95	V	$T_J=25^\circ\text{C}, I_S=9\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		17		ns	$T_J=25^\circ\text{C}, I_F=5.5\text{A},$ $di/dt= 100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		8.3		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.

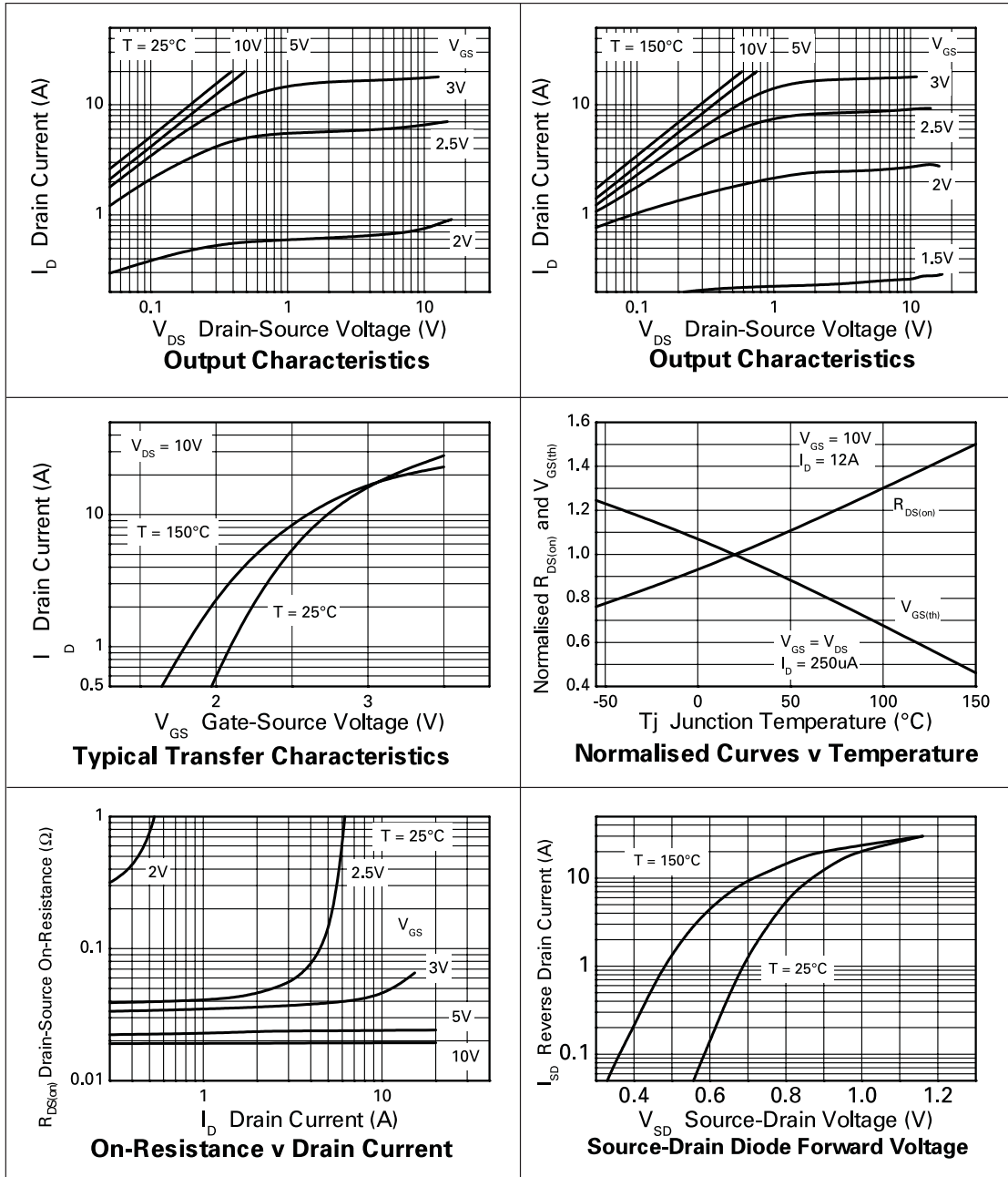
(3) For design aid only, not subject to production testing.



ISSUE 1 - JANUARY 2002

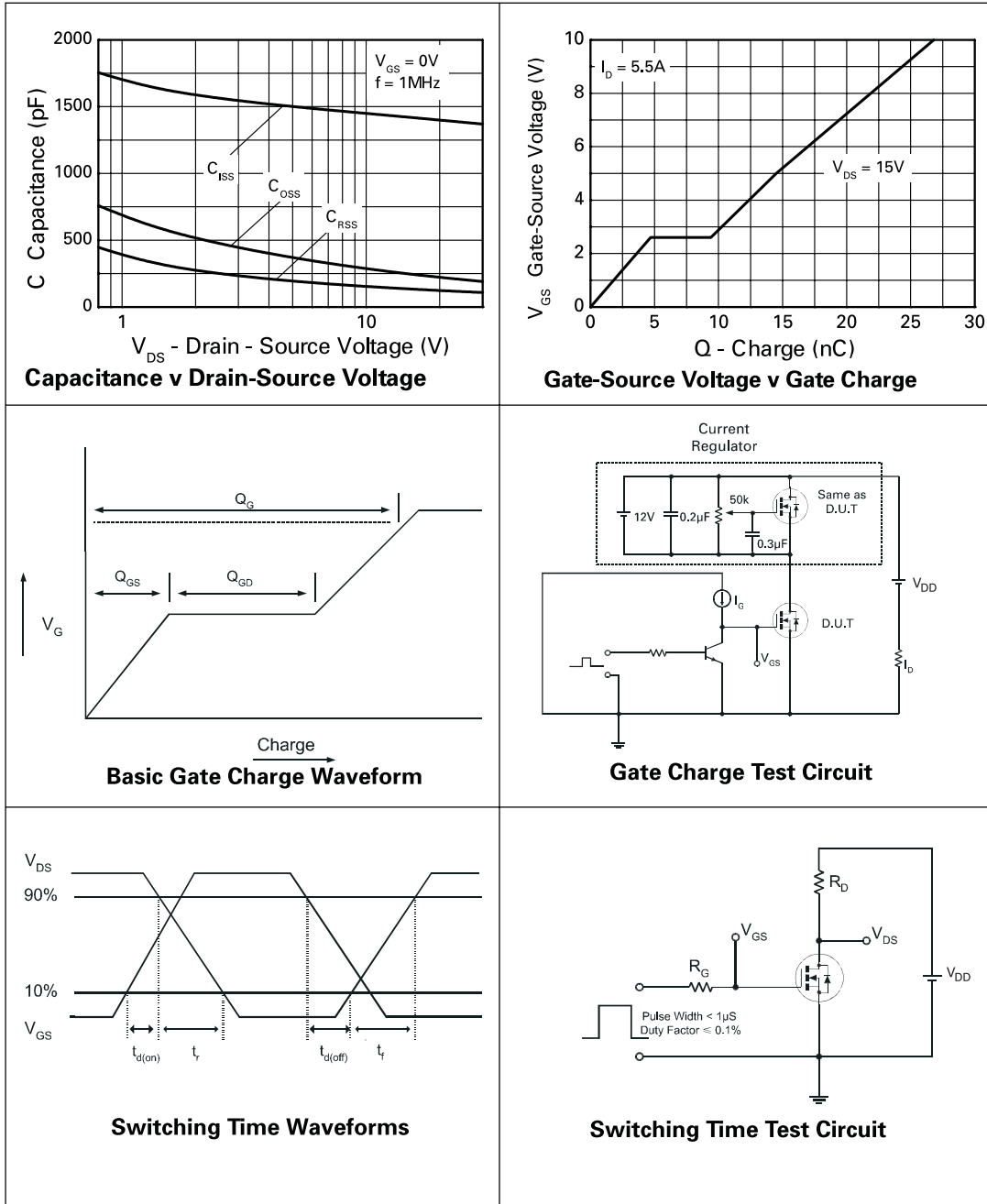
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## CHARACTERISTICS



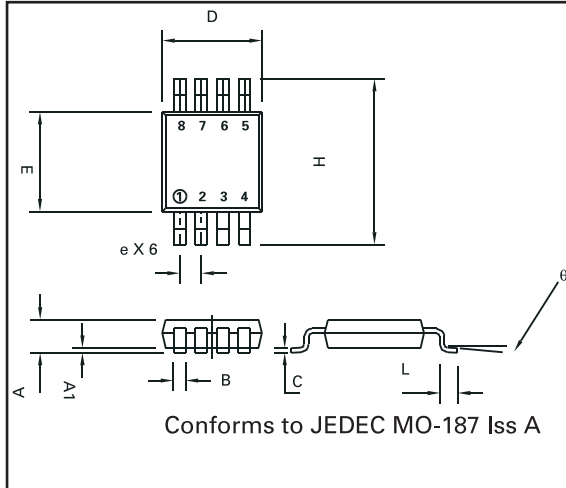
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## CHARACTERISTICS



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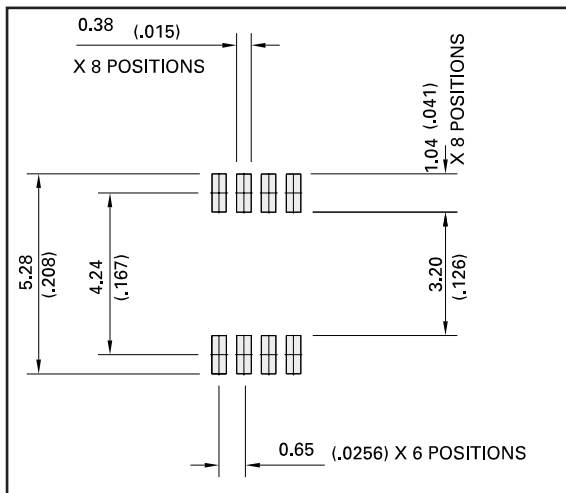
## PACKAGE OUTLINE



## PACKAGE DIMENSION

DIM	Millimetres		Inches	
	MIN	MAX	MIN	MAX
A		1.10		0.043
A1	0.05	0.15	0.002	0.006
B	0.25	0.40	0.010	0.016
C	0.13	0.23	0.005	0.009
D	2.90	3.10	0.114	0.122
e	0.65	BSC	0.0256	BSC
E	2.90	3.10	0.114	0.122
H	4.90	BSC	0.193	BSC
L	0.40	0.70	0.016	0.028
$\theta^\circ$	0°	6°	0°	6°

## PAD LAYOUT



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ISSUE 1 - JANUARY 2002

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