

# ZXMN3A02N8

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## 30V N-CHANNEL ENHANCEMENT MODE MOSFET

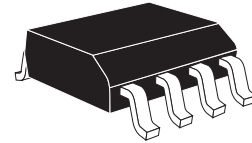
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### SUMMARY

$V_{(BR)DSS} = 30V$ ;  $R_{DS(ON)} = 0.025\Omega$   $I_D = 9.0A$

### 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.



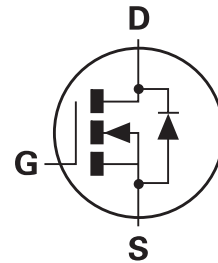
SO8

### FEATURES

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

### APPLICATIONS

- Disconnect switches
- Motor control



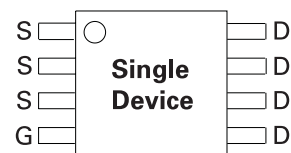
### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A02N8TA	7"	12mm	500 units
ZXMN3A02N8TC	13"	12mm	2500 units

### DEVICE MARKING

- ZXMN  
3A02

### PINOUT



Top View

# ZXMN3A02N8

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current $V_{GS}=-10V$ ; $T_A=25^\circ C$ (b) $V_{GS}=-10V$ ; $T_A=70^\circ C$ (b) $V_{GS}=-10V$ ; $T_A=25^\circ C$ (a)	$I_D$	9.0 7.2 7.3	A
Pulsed Drain Current (c)	$I_{DM}$	44	A
Continuous Source Current (Body Diode) (b)	$I_S$	3.2	A
Pulsed Source Current (Body Diode) (c)	$I_{SM}$	44	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	$P_D$	1.56 12.5	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	$P_D$	2.5 20	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 (a)	$R_{\theta JA}$	80	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	50	$^\circ C/W$

### NOTES

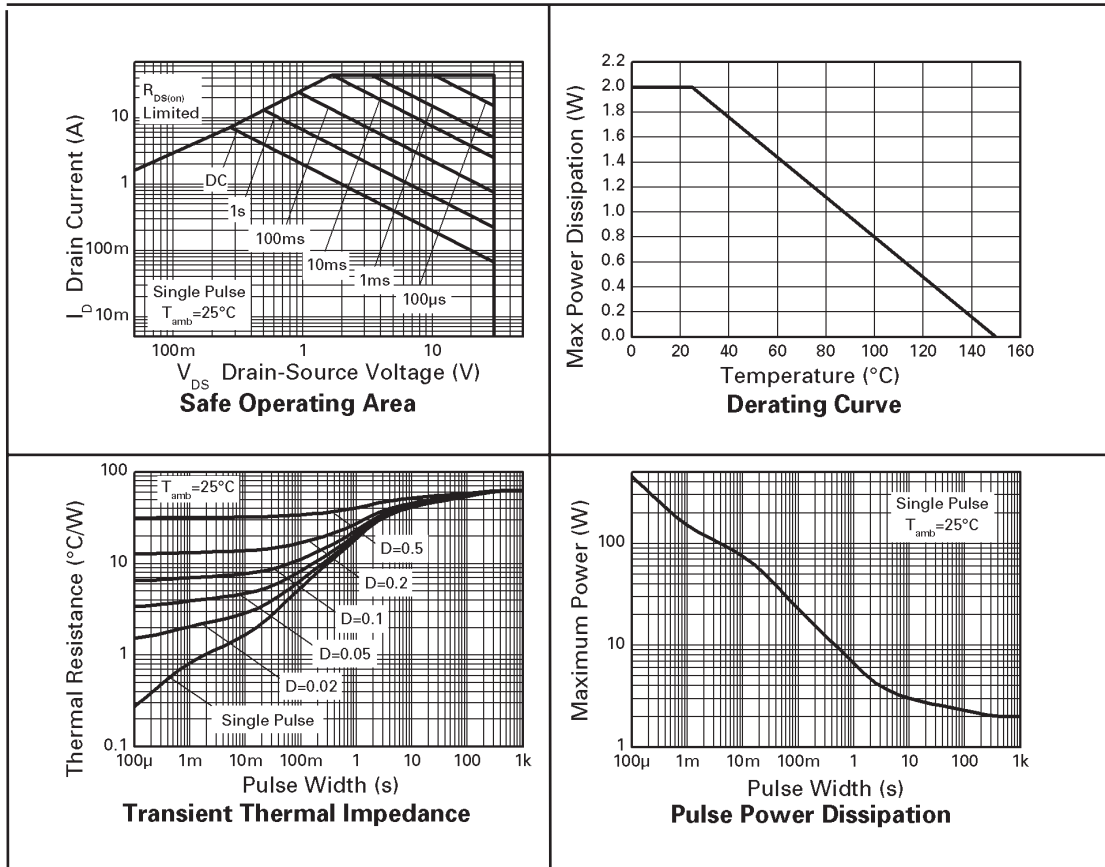
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

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

(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).

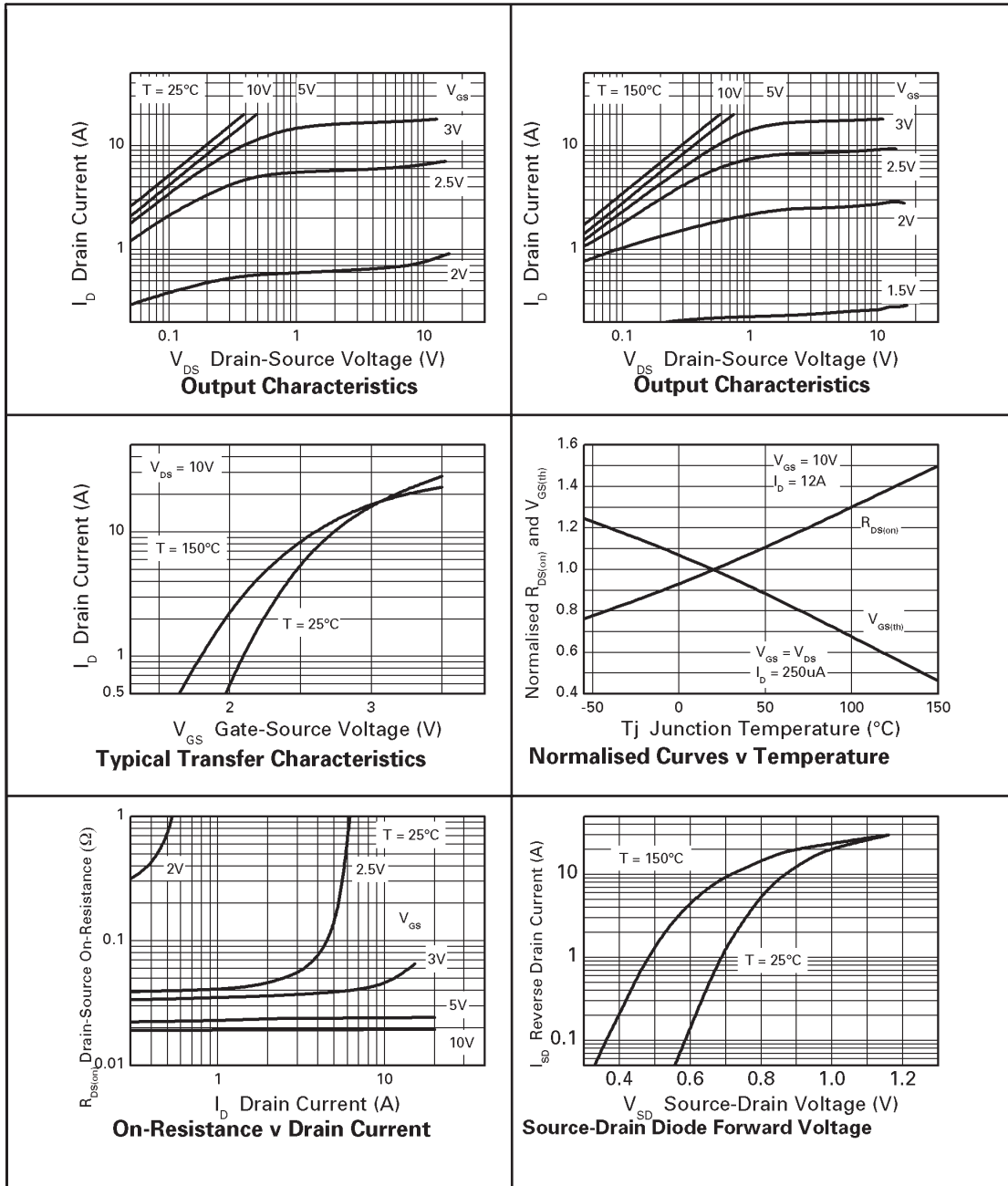
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			1	$\mu\text{A}$	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			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	$V_{DD}=10\text{V}, I_D=1\text{A}$ $R_G=6.0\Omega, V_{GS}=4.5\text{V}$ (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)	$V_{SD}$		0.85	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  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .  
 (2) Switching characteristics are independent of operating junction temperature.  
 (3) For design aid only, not subject to production testing.

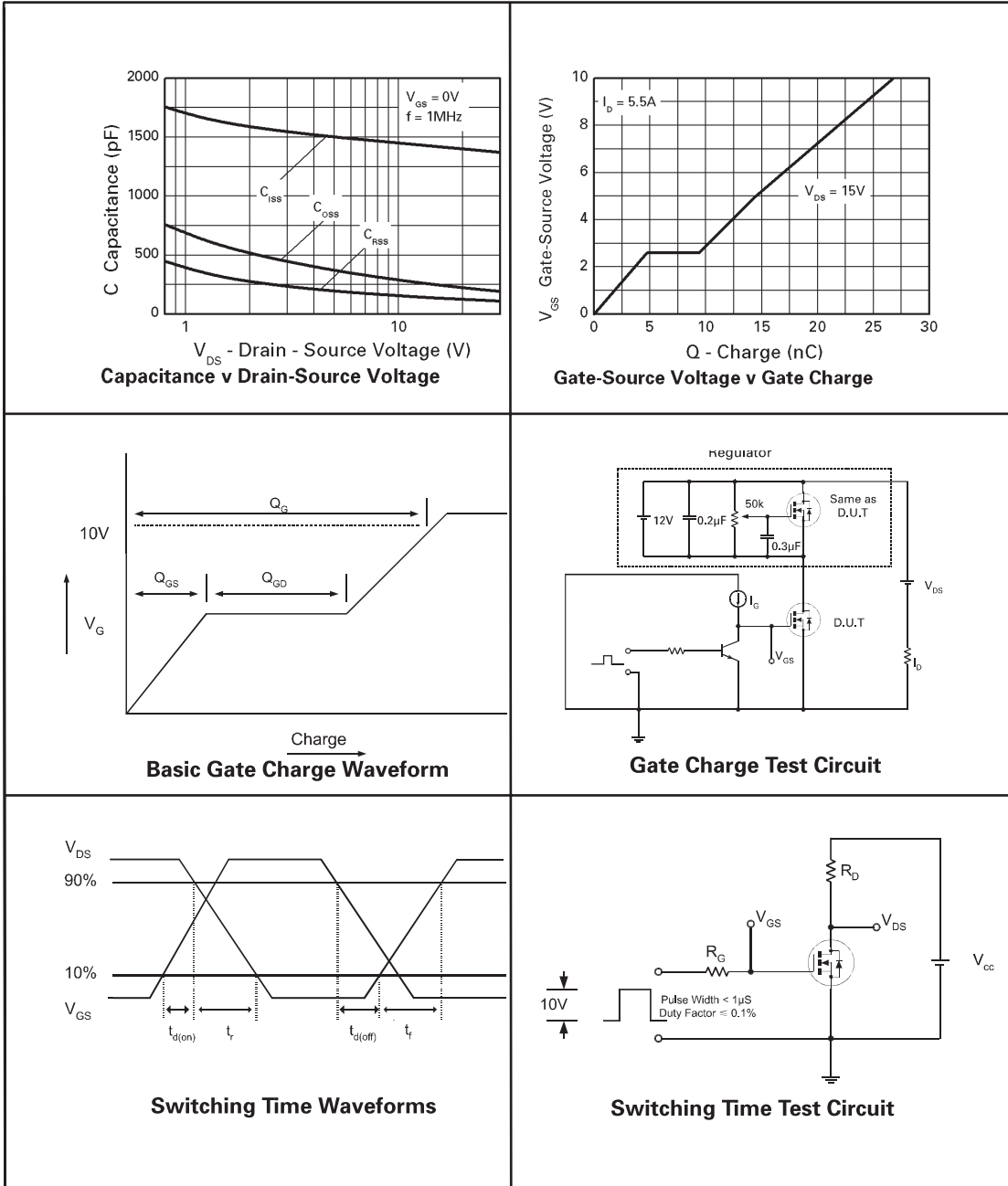
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## CHARACTERISTICS



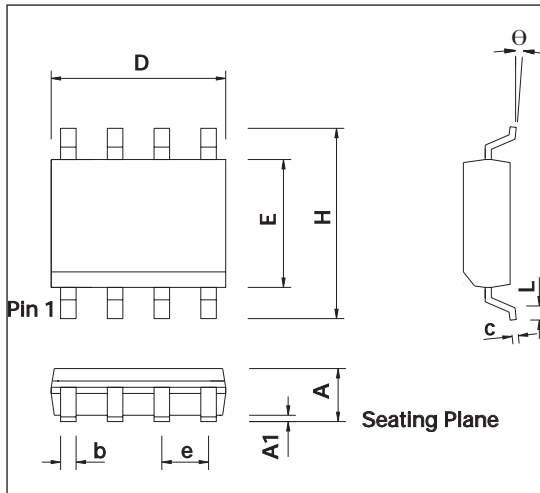
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## CHARACTERISTICS



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## PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES  
APPROX IN MILLIMETRES

## PACKAGE DIMENSIONS

DIM	INCHES		MILLIMETRES	
	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
theta	0°	8°	0°	8°
h	0.010	0.020	0.25	0.50

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