

# ZXMN2A02X8

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## 20V N-CANNEL ENHANCEMENT MODE MOSFET

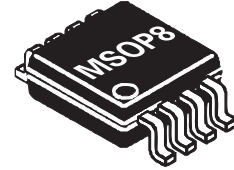
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### SUMMARY

$V_{(BR)DSS} = 20V$ ;  $R_{DS(ON)} = 0.02\Omega$   $I_D = 7.8A$

### 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.



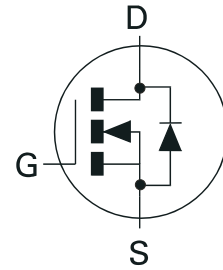
MSOP8

### FEATURES

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

### APPLICATIONS

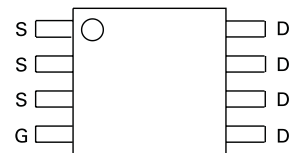
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control



### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN2A02X8TA	7"	12mm	1000 units
ZXMN2A02X8TC	13"	12mm	4000 units

### PINOUT



Top View

### DEVICE MARKING

- ZXMN  
2A02

# ZXMN2A02X8

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	20	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)	$I_D$	7.8 6.3 6.2	A
Pulsed Drain Current (c)	$I_{DM}$	39	A
Continuous Source Current (Body Diode) (b)	$I_S$	3.1	A
Pulsed Source Current (Body Diode) (c)	$I_{SM}$	39	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	$P_D$	1.1 8.8	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	$P_D$	1.67 13.4	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)	$R_{\theta JA}$	113	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	74.5	$^\circ C/W$

### NOTES

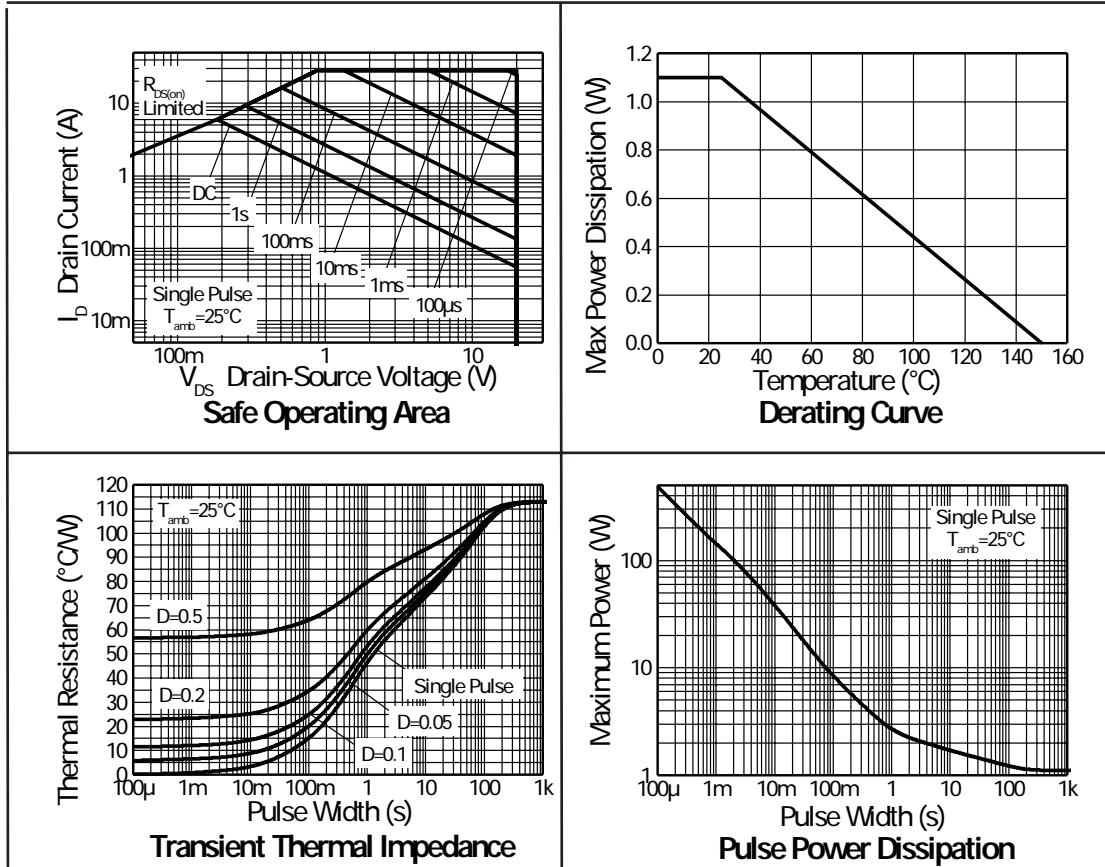
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

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

(c) Repetitive rating 25mm x 25mm FR4 PCB,  $D = 0.05$ , pulse width  $10 \mu s$  - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph. Refer to transient thermal impedance graph.

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## CHARACTERISTICS



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

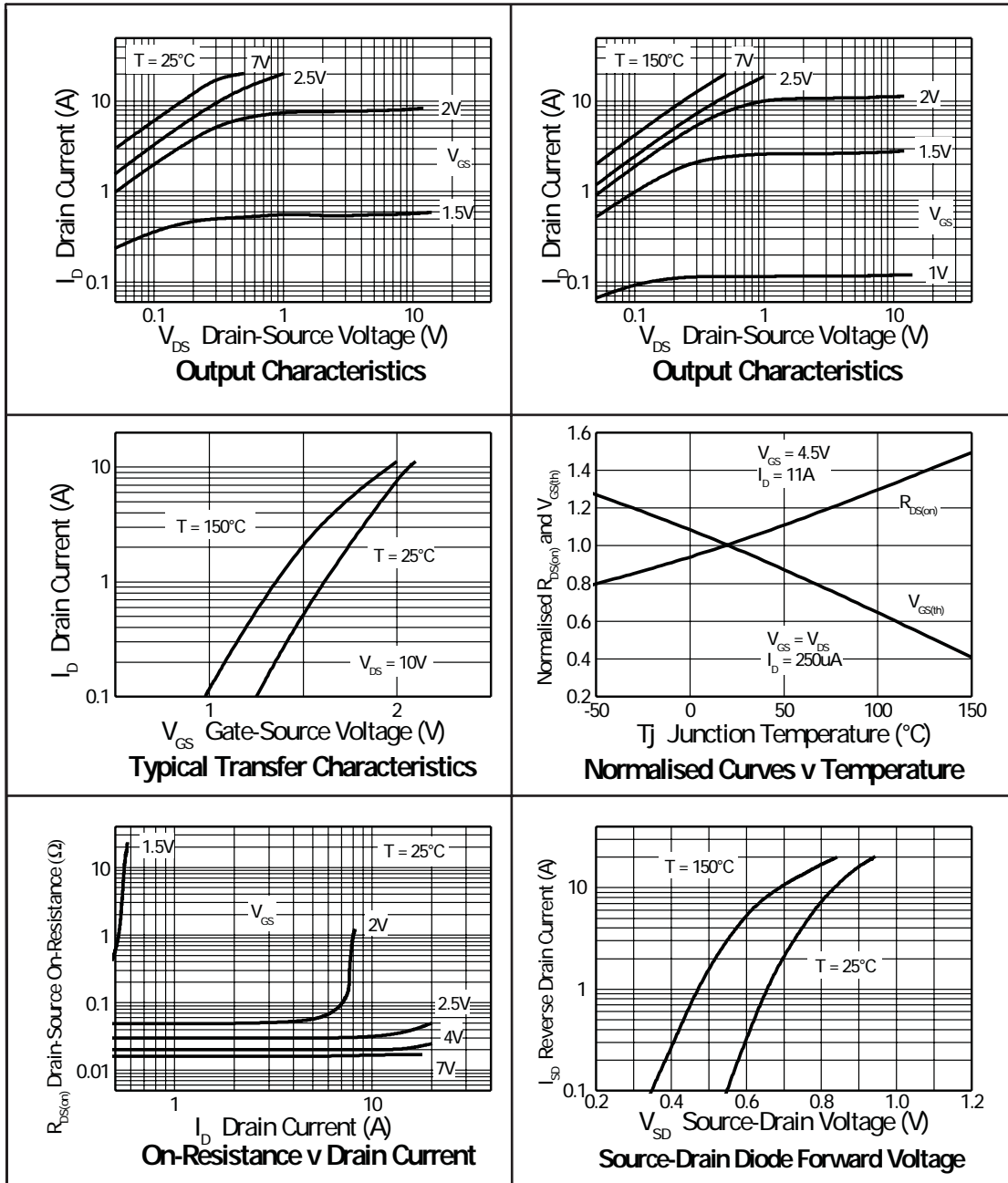
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			1	$\mu\text{A}$	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
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)	$R_{DS(on)}$			0.02 0.04	$\Omega$ $\Omega$	$V_{GS}=4.5\text{V}, I_D=11\text{A}$ $V_{GS}=2.5\text{V}, I_D=8.4\text{A}$
Forward Transconductance (1)(3)	$g_{fs}$		27		S	$V_{DS}=10\text{V}, I_D=11\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		1900		pF	$V_{DS}=10\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$		356		pF	
Reverse Transfer Capacitance	$C_{rss}$		218		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		7.9		ns	$V_{DD}=10\text{V}, I_D=1\text{A}$ $R_G=6.0\Omega, V_{GS}=4.5\text{V}$
Rise Time	$t_r$		10		ns	
Turn-Off Delay Time	$t_{d(off)}$		33.3		ns	
Fall Time	$t_f$		13.6		ns	
Total Gate Charge	$Q_g$		18.6		nC	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V},$ $I_D=11\text{A}$
Gate-Source Charge	$Q_{gs}$		5.2		nC	
Gate-Drain Charge	$Q_{gd}$		4.9		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$		0.85	0.95	V	$T_J=25^\circ\text{C}, I_S=11.5\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		16.3		ns	$T_J=25^\circ\text{C}, I_F=2.1\text{A},$ $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		7.8		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.

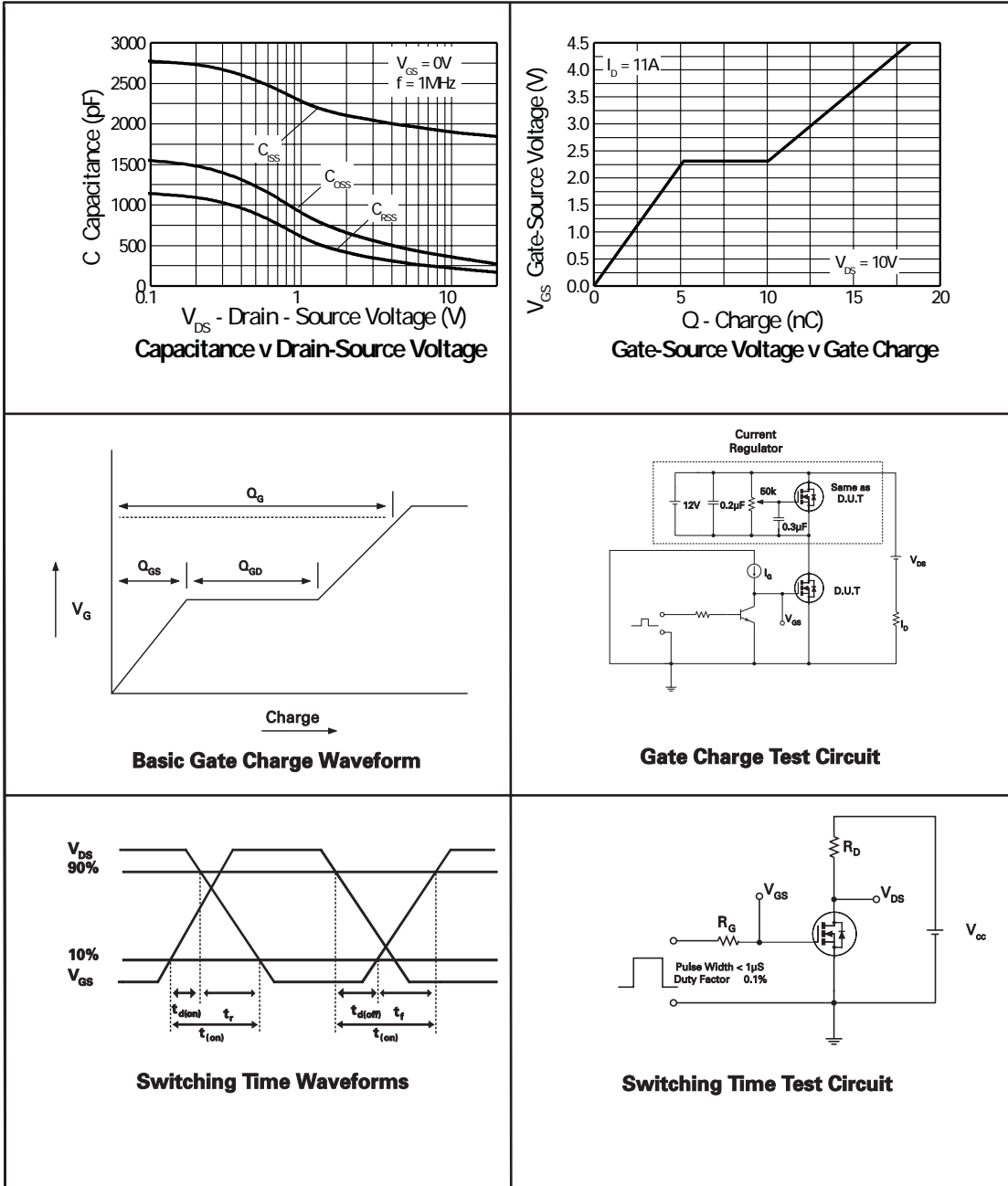
# ZXMN2A02X8

## TYPICAL CHARACTERISTICS



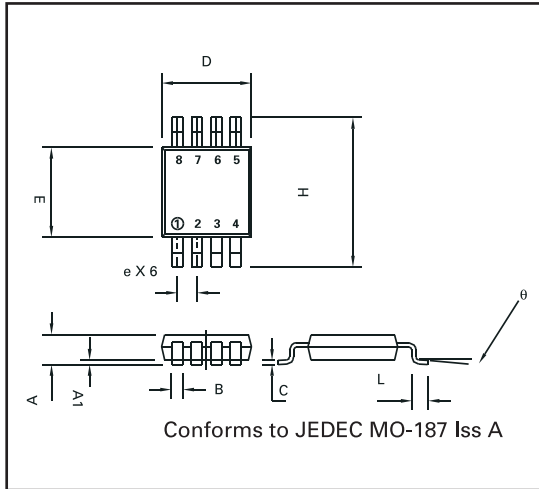
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## TYPICAL CHARACTERISTICS

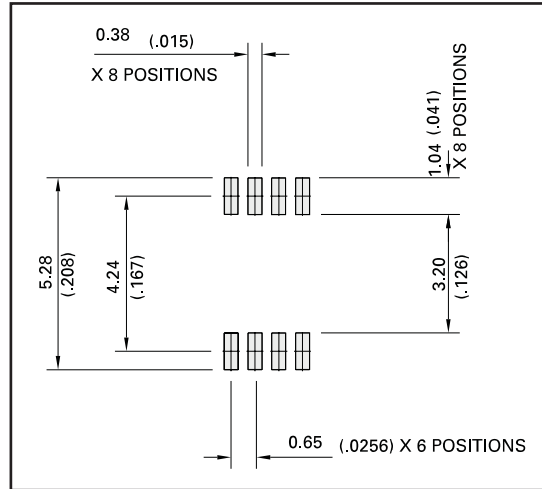


# ZXMN2A02X8

## PACKAGE OUTLINE



## PAD LAYOUT



## PACKAGE DIMENSIONS

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

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