



**THE DATASHEET OF  
ZXMN2A02N8TA**



# ZXMN2A02N8

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## 20V N-CANNEL ENHANCEMENT MODE MOSFET

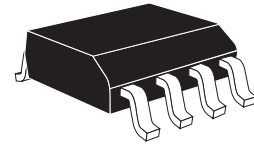
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### SUMMARY

$V_{(BR)DSS} = 20V$ ;  $R_{DS(ON)} = 0.02\Omega$ ;  $I_D = 10.2A$

### 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.



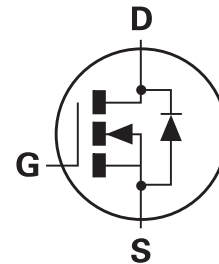
SO8

### FEATURES

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

### APPLICATIONS

- Disconnect switches
- Motor control

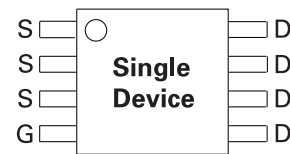


### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN2A02N8TA	7"	12mm	500 units
ZXMN2A02N8TC	13"	12mm	2500 units

### DEVICE MARKING

- ZXMN  
2A02



Top View

# ZXMN2A02N8

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	20	V
Gate Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current $V_{GS}=10V; T_A=25^\circ C$ <sup>(b)</sup> $V_{GS}=10V; T_A=70^\circ C$ <sup>(b)</sup> $V_{GS}=10V; T_A=25^\circ C$ <sup>(a)</sup>	$I_D$	10.2 8.2 8.3	A
Pulsed Drain Current <sup>(c)</sup>	$I_{DM}$	50	A
Continuous Source Current (Body Diode) <sup>(b)</sup>	$I_S$	4.3	A
Pulsed Source Current (Body Diode) <sup>(c)</sup>	$I_{SM}$	50	A
Power Dissipation at $T_A=25^\circ C$ <sup>(a)</sup> Linear Derating Factor	$P_D$	1.56 12.5	W mW/°C
Power Dissipation at $T_A=25^\circ C$ <sup>(b)</sup> Linear Derating Factor	$P_D$	2.5 20	W mW/°C
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to 150	°C

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient <sup>(a)</sup>	$R_{\theta JA}$	80	°C/W
Junction to Ambient <sup>(b)</sup>	$R_{\theta JA}$	50	°C/W

### NOTES

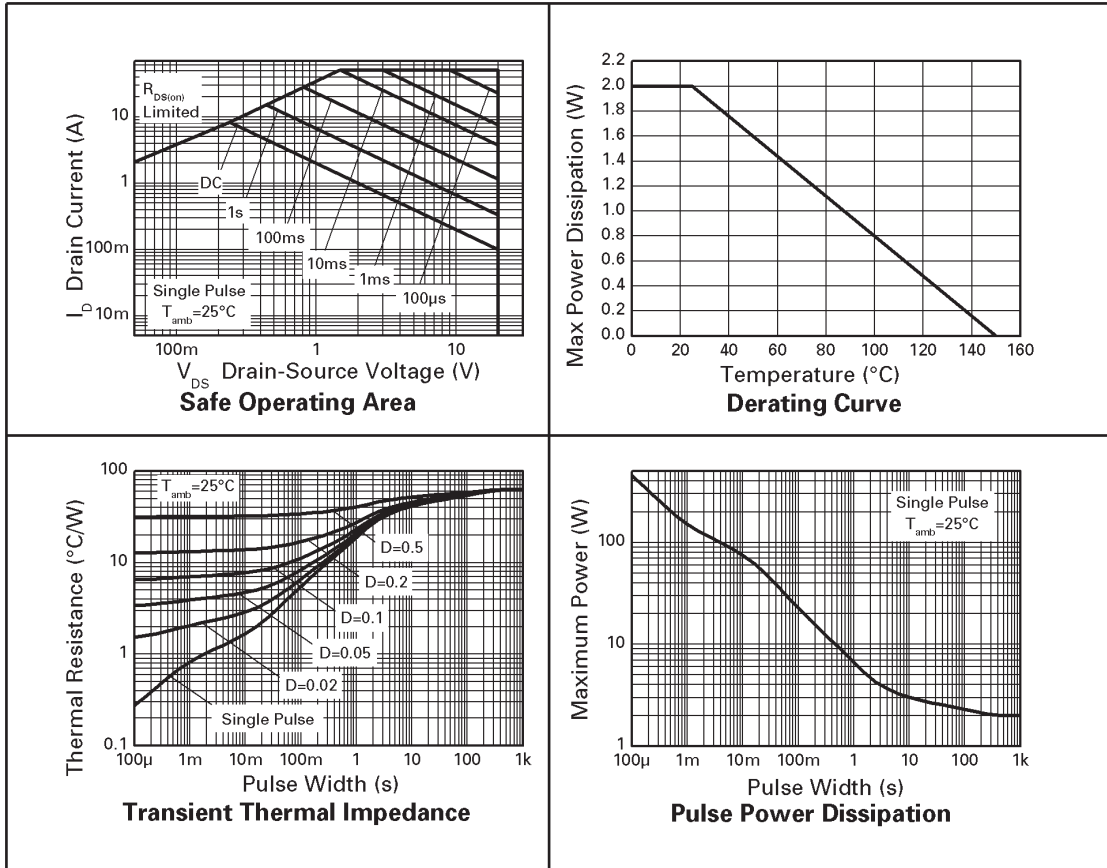
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(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.

# ZXMN2A02N8

## CHARACTERISTICS



# ZXMN2A02N8

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

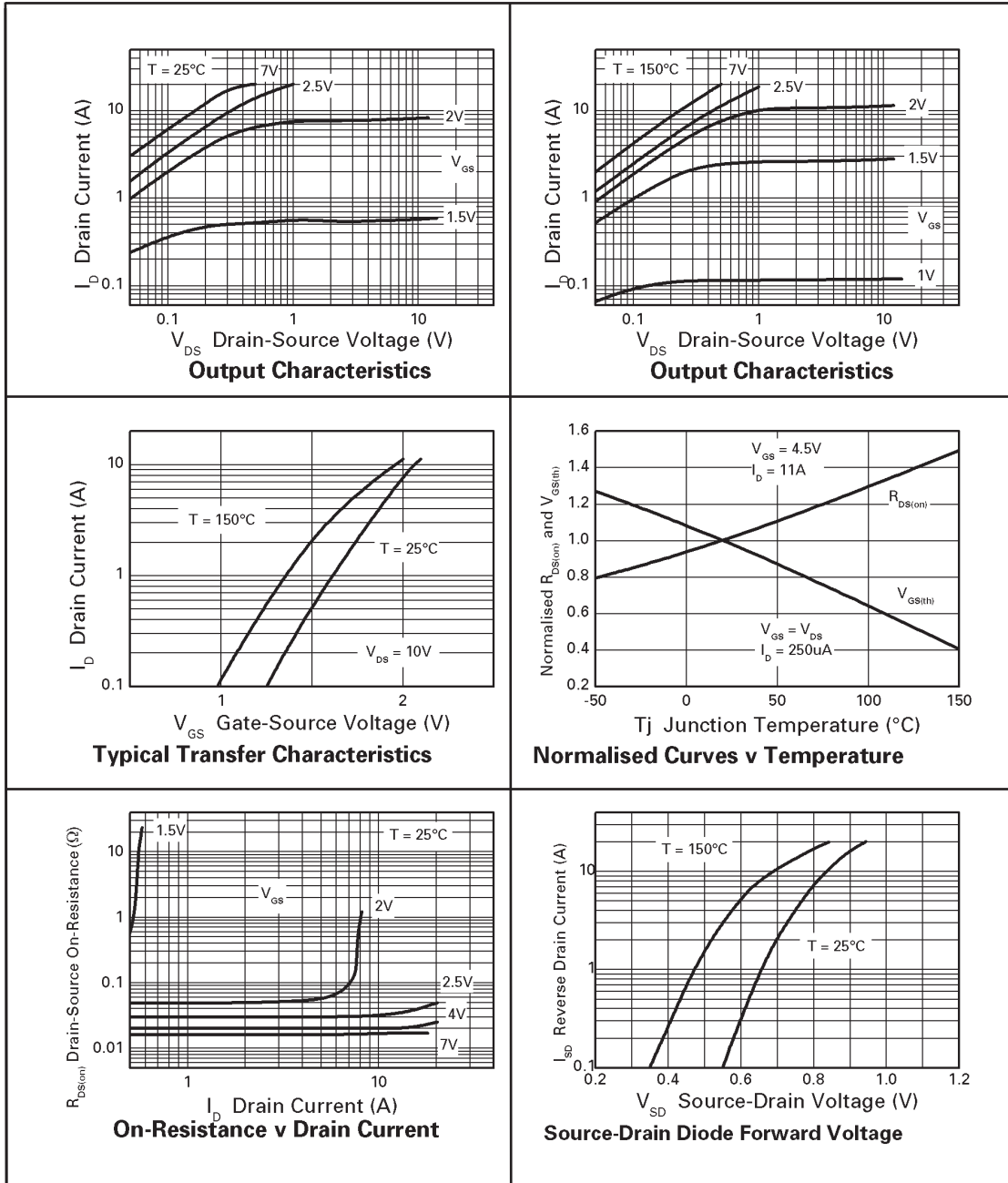
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			1	$\mu\text{A}$	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
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 <sup>(1)</sup>	$R_{DS(on)}$			0.02	$\Omega$	$V_{GS}=4.5\text{V}, I_D=11\text{A}$
				0.04	$\Omega$	$V_{GS}=2.5\text{V}, I_D=8.4\text{A}$
Forward Transconductance <sup>(1)(3)</sup>	$g_{fs}$		27		S	$V_{DS}=10\text{V}, I_D=11\text{A}$
<b>DYNAMIC</b> <sup>(3)</sup>						
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</b> <sup>(2) (3)</sup>						
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	$Q_g$		18.9		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 <sup>(1)</sup>	$V_{SD}$		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 <sup>(3)</sup>	$t_{rr}$		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 <sup>(3)</sup>	$Q_{rr}$		7.8		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.

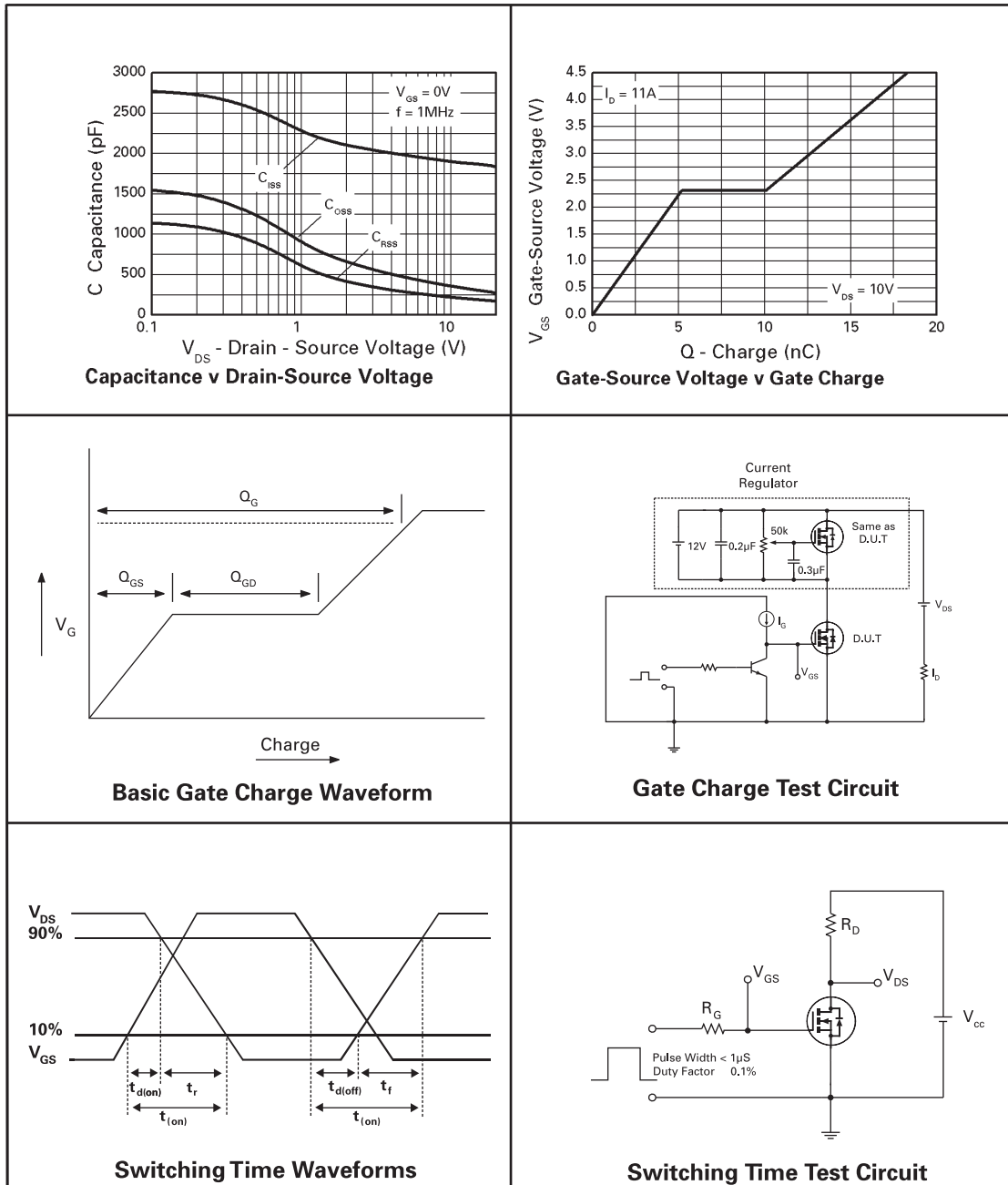
# ZXMN2A02N8

## CHARACTERISTICS



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## CHARACTERISTICS



# ZXMN2A02N8

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### Product status key:

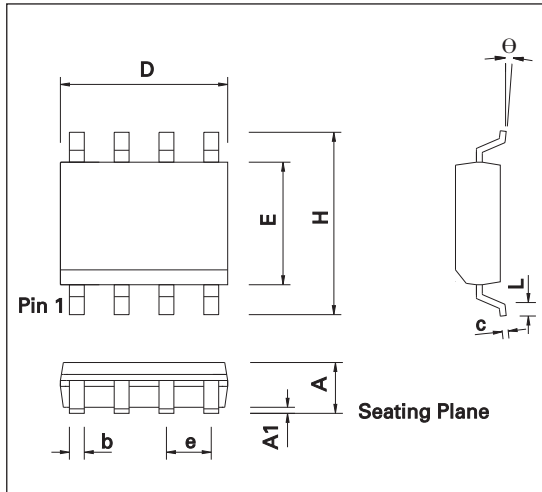
- "Preview"Future device intended for production at some point. Samples may be available
- "Active"Product status recommended for new designs
- "Last time buy (LTB)"Device will be discontinued and last time buy period and delivery is in effect
- "Not recommended for new designs"Device is still in production to support existing designs and production
- "Obsolete"Production has been discontinued

### Datasheet status key:

- "Draft version" This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.
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# ZXMN2A02N8

## PACKAGE OUTLINE



CONTROLLING DIMENSIONS ARE IN INCHES  
APPROX IN MILLIMETERS

## 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
θ	0°	8°	0°	8°
h	0.010	0.020	0.25	0.50

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