

ZXMN2A02N8

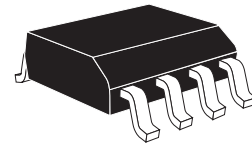
20V N-CHANNEL ENHANCEMENT MODE MOSFET

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.



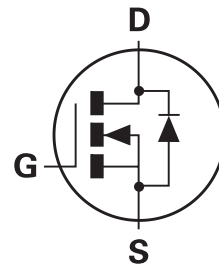
SO8

FEATURES

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

APPLICATIONS

- Disconnect switches
- Motor control

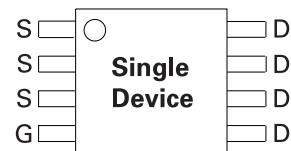


ORDERING INFORMATION

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}	± 12	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	10.2 8.2 8.3	A
Pulsed Drain Current ^(c)	I_{DM}	50	A
Continuous Source Current (Body Diode) ^(b)	I_S	4.3	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	50	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

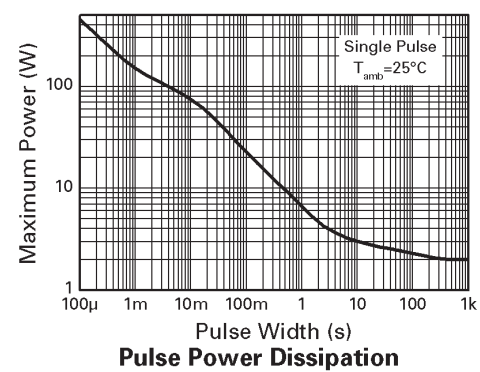
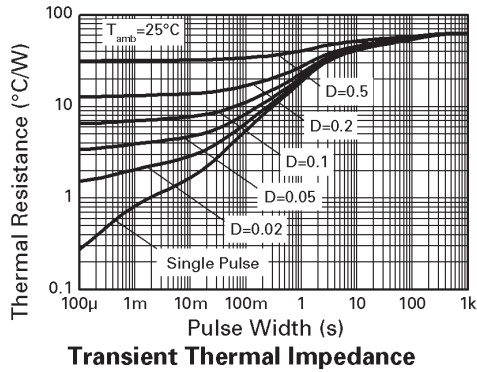
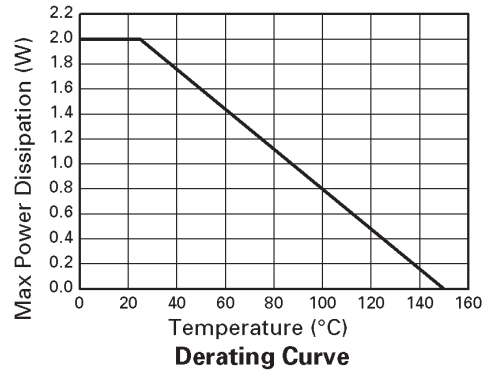
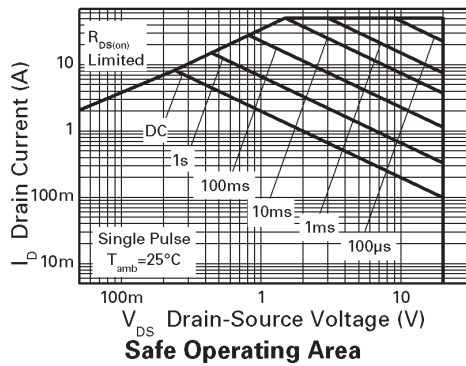
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(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 μs - 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).

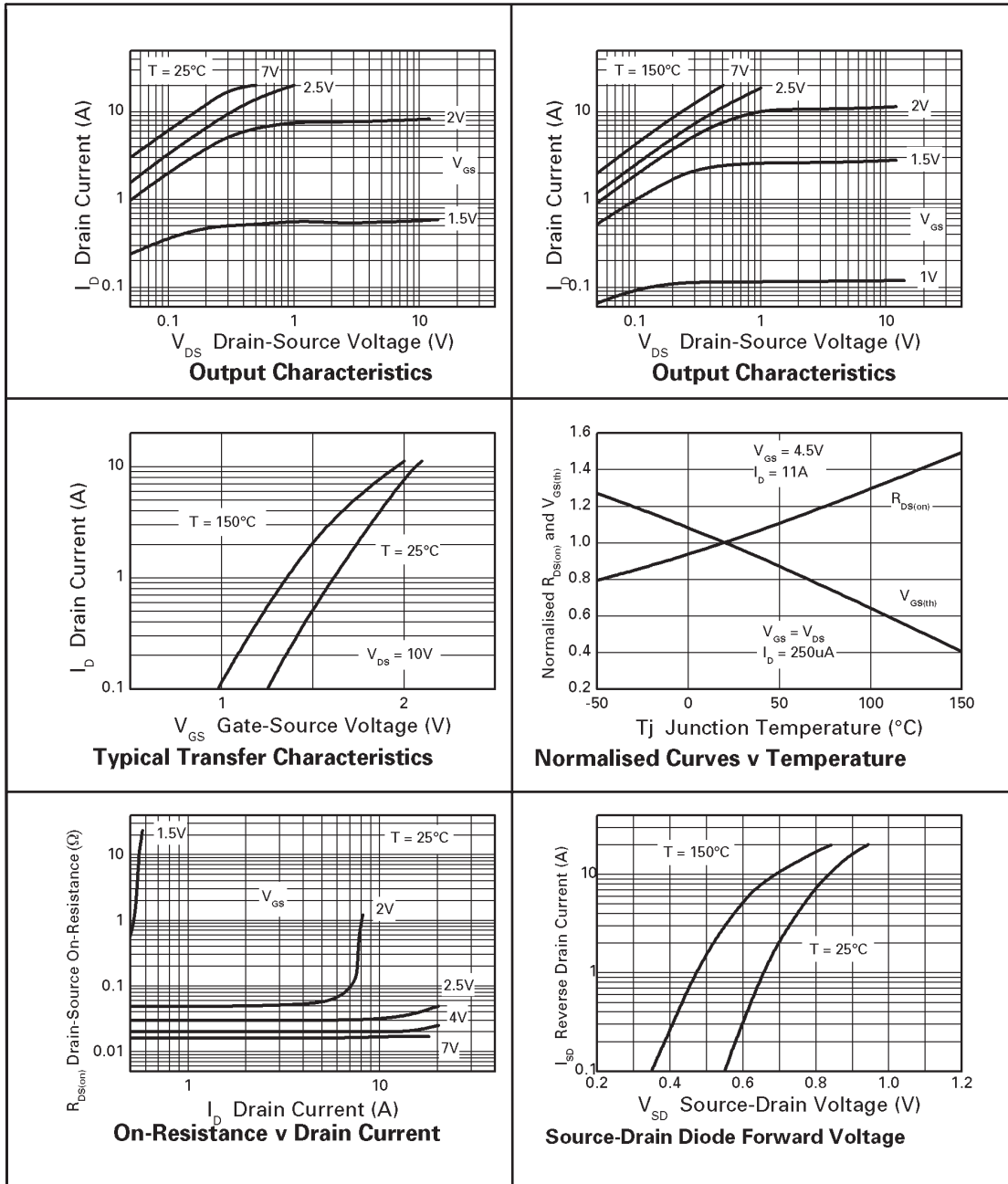
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	V(BR)DSS	20			V	I _D =250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =20V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±12V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	0.7			V	I _D =250μA, V _{DS} = V _{GS}
Static Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}			0.02	Ω	V _{GS} =4.5V, I _D =11A
				0.04	Ω	V _{GS} =2.5V, I _D =8.4A
Forward Transconductance ⁽¹⁾⁽³⁾	g _{fs}		27		S	V _{DS} =10V,I _D =11A
DYNAMIC ⁽³⁾						
Input Capacitance	C _{iss}		1900		pF	V _{DS} =10V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{oss}		356		pF	
Reverse Transfer Capacitance	C _{rss}		218		pF	
SWITCHING ^{(2) (3)}						
Turn-On Delay Time	t _{d(on)}		7.9		ns	V _{DD} =10V, I _D =1A R _G =6.0Ω, V _{GS} =4.5V
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} =10V,V _{GS} =4.5V, I _D =11A
Gate-Source Charge	Q _{gs}		5.2		nC	
Gate-Drain Charge	Q _{gd}		4.9		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V _{SD}		0.85	0.95	V	T _J =25°C, I _S =11.5A, V _{GS} =0V
Reverse Recovery Time ⁽³⁾	t _{rr}		16.3		ns	T _J =25°C, I _F =2.1A,
Reverse Recovery Charge ⁽³⁾	Q _{rr}		7.8		nC	di/dt= 100A/μs

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.

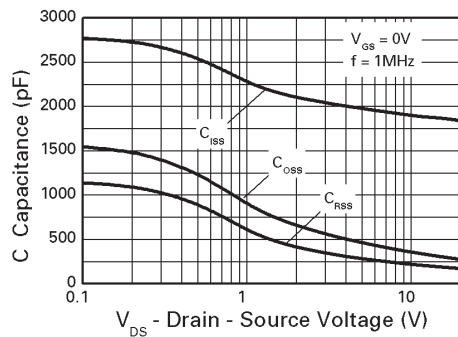
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CHARACTERISTICS

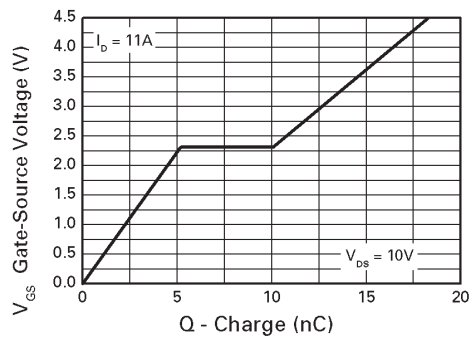


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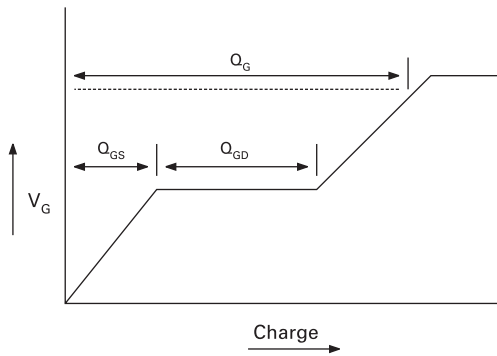
CHARACTERISTICS



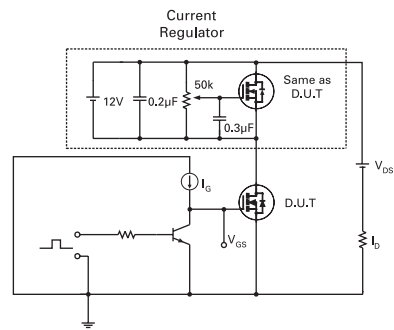
Capacitance v Drain-Source Voltage



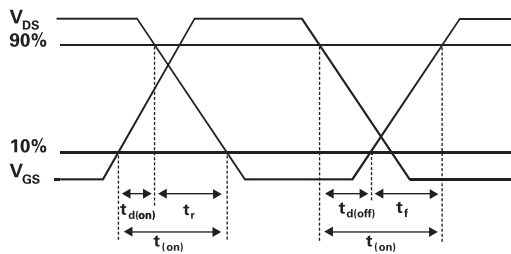
Gate-Source Voltage v Gate Charge



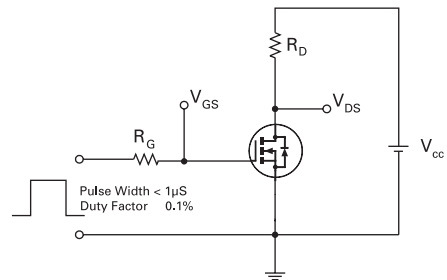
Basic Gate Charge Waveform



Gate Charge Test Circuit



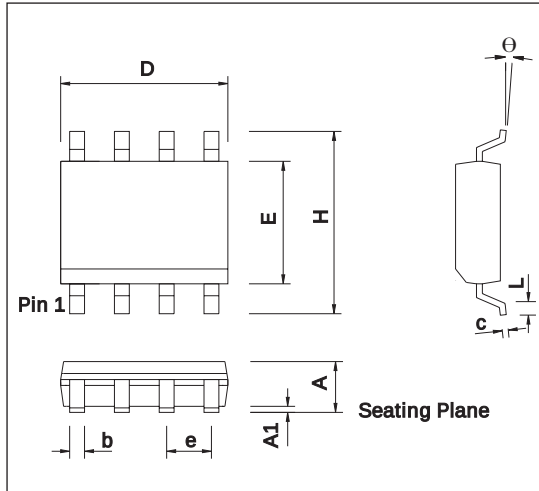
Switching Time Waveforms



Switching Time Test Circuit

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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
Θ	0°	8°	0°	8°
h	0.010	0.020	0.25	0.50

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ISSUE 5 - JANUARY 2005