

ZXMN2A14F

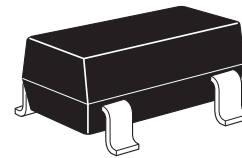
20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 20V$: $R_{DS(on)} = 0.06\Omega$; $I_D = 4.1A$

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.



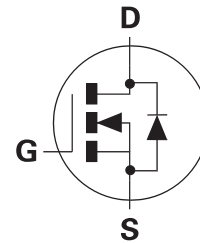
SOT23

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23 package

APPLICATIONS

- DC-DC converters
- Power management functions
- Disconnect switches
- Motor control



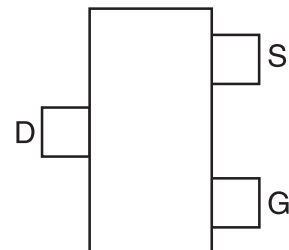
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN2A14FTA	7"	8mm	3000 units

DEVICE MARKING

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PINOUT



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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current @ $V_{GS}=4.5V$; $T_A=25^\circ C$ ^(b)	I_D	4.1	A
@ $V_{GS}=4.5V$; $T_A=70^\circ C$ ^(b)		3.3	A
@ $V_{GS}=4.5V$; $T_A=25^\circ C$ ^(a)		3.4	A
Pulsed Drain Current ^(c)	I_{DM}	19	A
Continuous Source Current (Body Diode) ^(b)	I_S	1.7	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	19	A
Power Dissipation at $T_A=25^\circ C$ ^(a)	P_D	1	W
Linear Derating Factor		8	mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ ^(b)	P_D	1.5	W
Linear Derating Factor		12	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)	$R_{\theta JA}$	125	$^\circ C/W$
Junction to Ambient ^(b)	$R_{\theta JA}$	82	$^\circ C/W$

NOTES

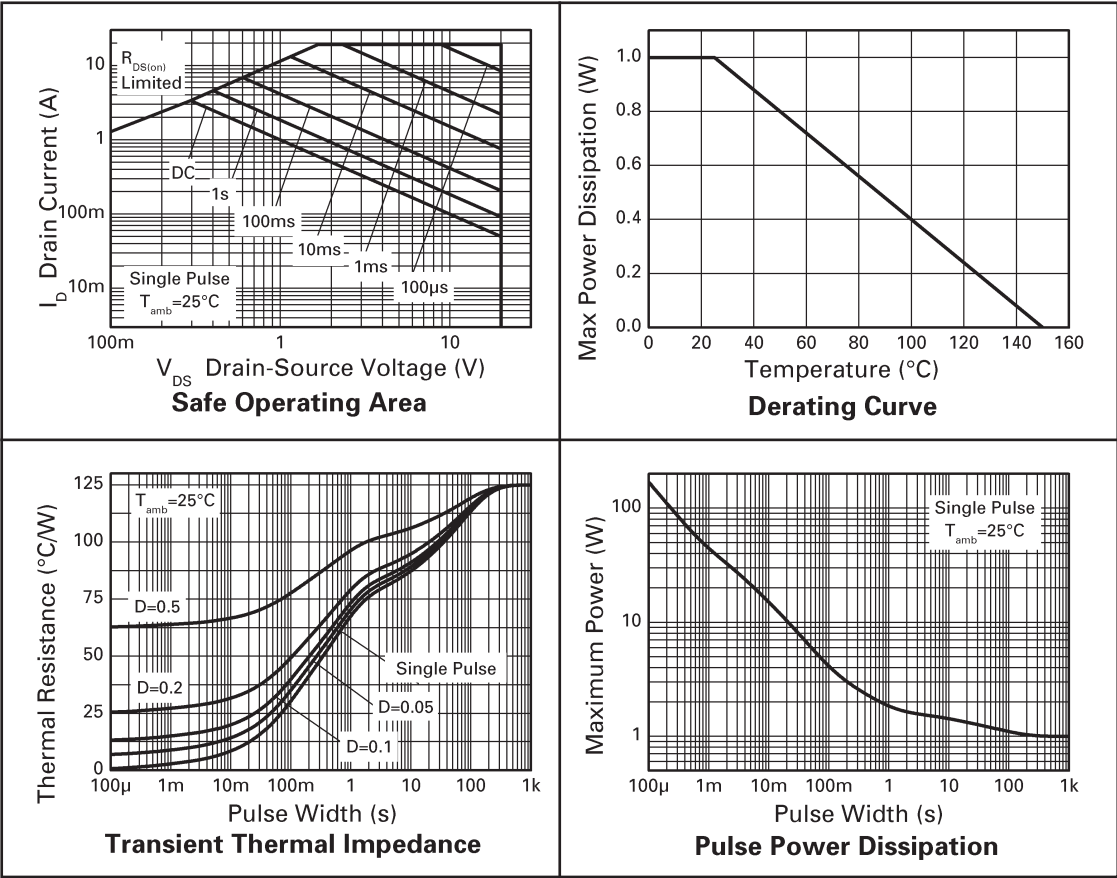
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ sec.

(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)

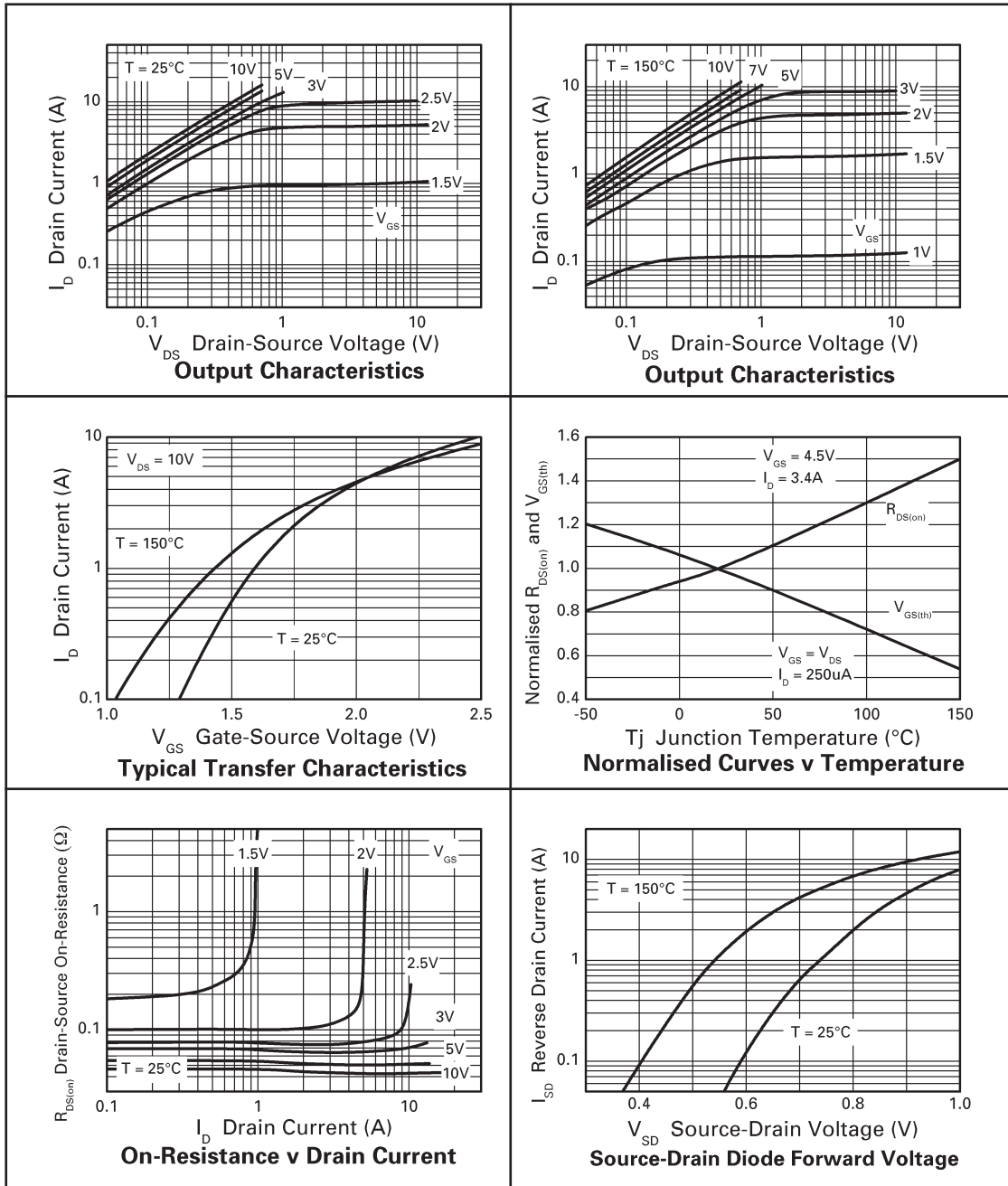
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	$I_D=250\mu A$, $V_{GS}=0V$
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	$V_{DS}=20V$, $V_{GS}=0V$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 12V$, $V_{DS}=0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.7			V	$I_D=250\mu A$, $V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(on)}$			0.060	Ω	$V_{GS}=4.5V$, $I_D=3.4A$
				0.110	Ω	$V_{GS}=2.5V$, $I_D=2.5A$
Forward Transconductance ^{(1) (3)}	g_{fs}		9.4		S	$V_{DS}=10V$, $I_D=3.4A$
DYNAMIC ⁽³⁾						
Input Capacitance	C_{iss}		544		pF	$V_{DS}=10V$, $V_{GS}=0V$, $f=1MHz$
Output Capacitance	C_{oss}		132		pF	
Reverse Transfer Capacitance	C_{rss}		85		pF	
SWITCHING ^{(2) (3)}						
Turn-On Delay Time	$t_{d(on)}$		4.0		ns	$V_{DD}=10V$, $V_{GS}=4.5V$ $I_D=1A$ $R_G \equiv 6.0\Omega$
Rise Time	t_r		5.3		ns	
Turn-Off Delay Time	$t_{d(off)}$		16.6		ns	
Fall Time	t_f		9.5		ns	
Total Gate Charge	Q_g		6.6		nC	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=3.4A$
Gate-Source Charge	Q_{gs}		1.2		nC	
Gate-Drain Charge	Q_{gd}		2.1		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V_{SD}		0.85	0.95	V	$T_J=25^{\circ}C$, $I_S=(3.3)A$, $V_{GS}=0V$
Reverse Recovery Time ⁽³⁾	t_{rr}		11.4		ns	$T_J=25^{\circ}C$, $I_F=(1.7)A$,
Reverse Recovery Charge ⁽³⁾	Q_{rr}		4.6		nC	$di/dt=100A/\mu s$

NOTES

- (1) Measured under pulsed conditions. Pulse 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.

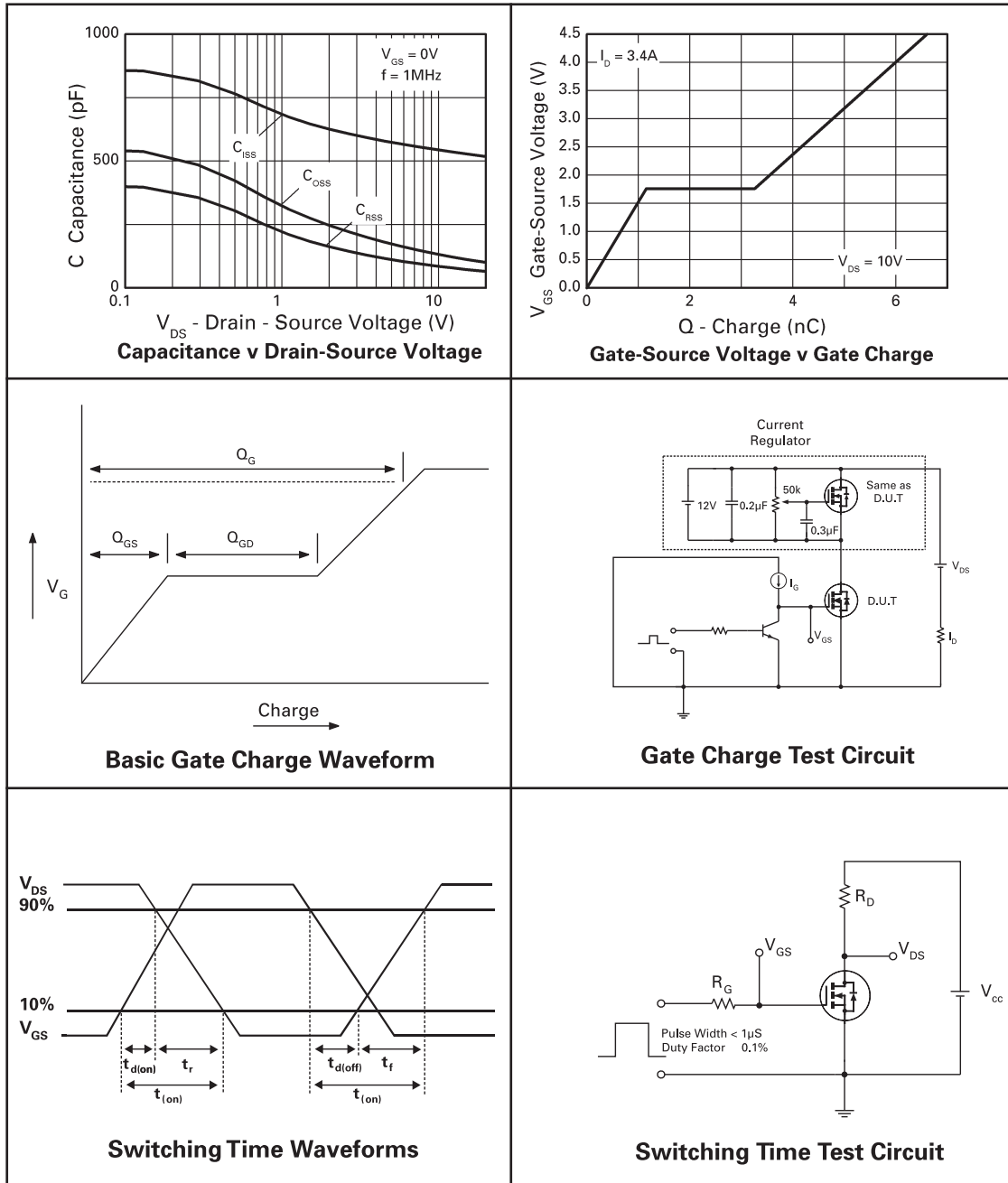
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TYPICAL CHARACTERISTICS



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TYPICAL CHARACTERISTICS



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"Not recommended for new designs"Device is still in production to support existing designs and production

"Obsolete"Production has been discontinued

Datasheet status key:

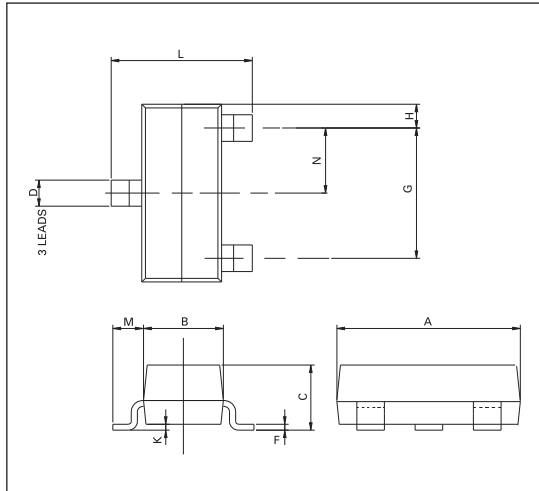
"Draft version" This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.

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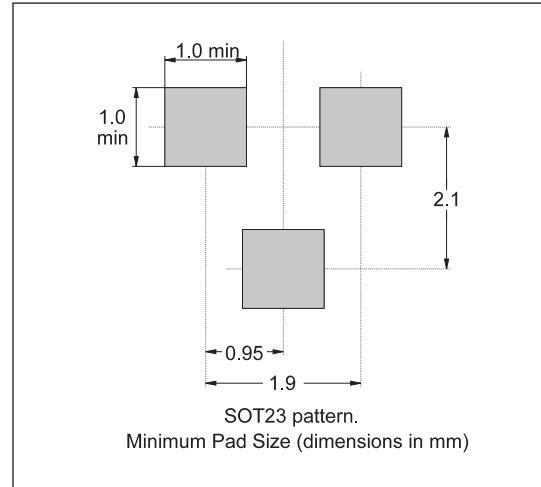
"Issue" This term denotes an issued datasheet containing finalized specifications. However, changes to specifications may occur, at any time and without notice.

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PACKAGE OUTLINE



PAD LAYOUT



Controlling dimensions are in millimetres. Approximate conversions are given in inches

PACKAGE DIMENSIONS

DIM	MILLIMETRES		INCHES		DIM	MILLIMETRES		INCHES	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	—	1.10	—	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		Θ	10° TYP		10° TYP	

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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Kustermannpark Balanstraße 59 D-81541 München Germany Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europe.sales@zetex.com	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Zetex Semiconductors plc Zetex Technology Park Chadderton, Oldham, OL9 9LL United Kingdom Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com



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