

ZXMN2A14F

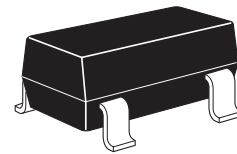
20V N-CHANNEL ENHANCEMENT MODE MOSFET

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.



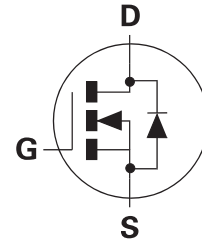
SOT23

FEATURES

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

APPLICATIONS

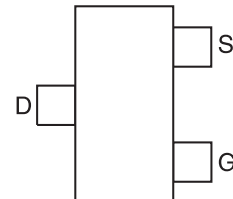
- DC-DC Converters
- Power Management functions
- Disconnect switches
- Motor control



ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN2A14FTA	7"	8mm	3000 units
ZXMN2A14FTC	13"	8mm	10000 units

PINOUT



DEVICE MARKING

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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

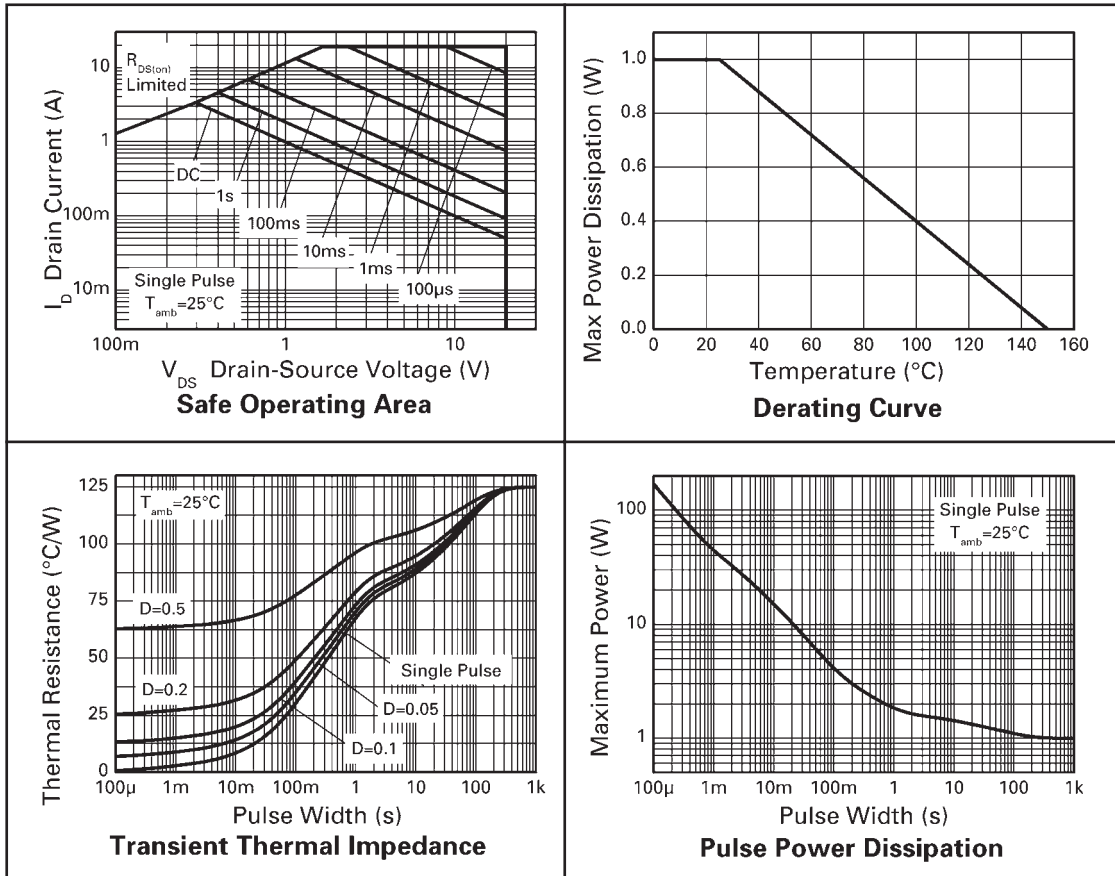
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(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)

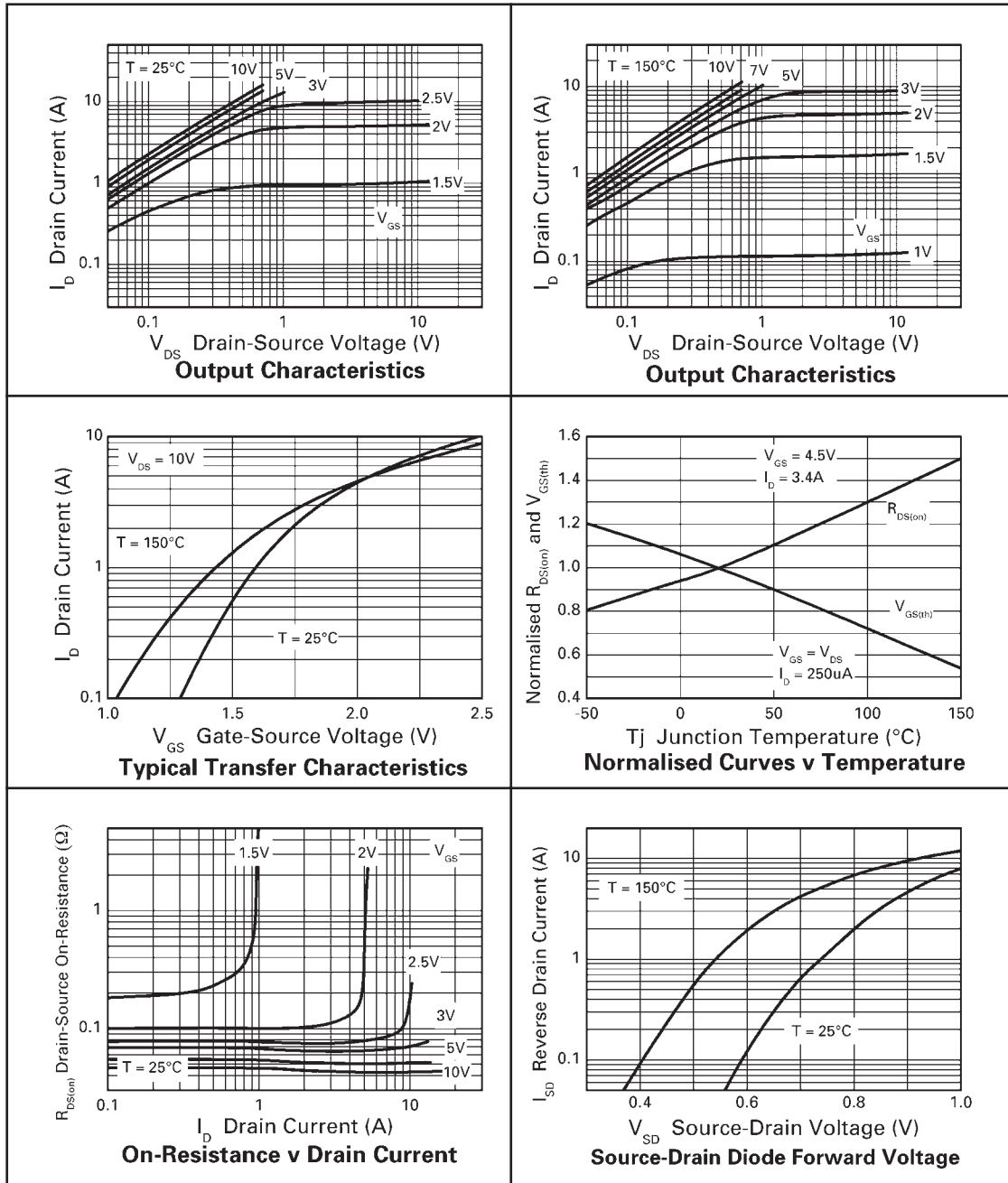
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	30			V	I _D =250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =20V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±12V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	0.7			V	I _D =250μA, V _{DS} = V _{GS}
Static Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}			0.060	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 ≡ 6.0Ω
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°C, I _S =(3.3)A, V _{GS} =0V
Reverse Recovery Time ⁽³⁾	t _{rr}		11.4		ns	T _J =25°C, I _F =(1.7)A,
Reverse Recovery Charge ⁽³⁾	Q _{rr}		4.6		nC	di/dt= 100A/μs

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.

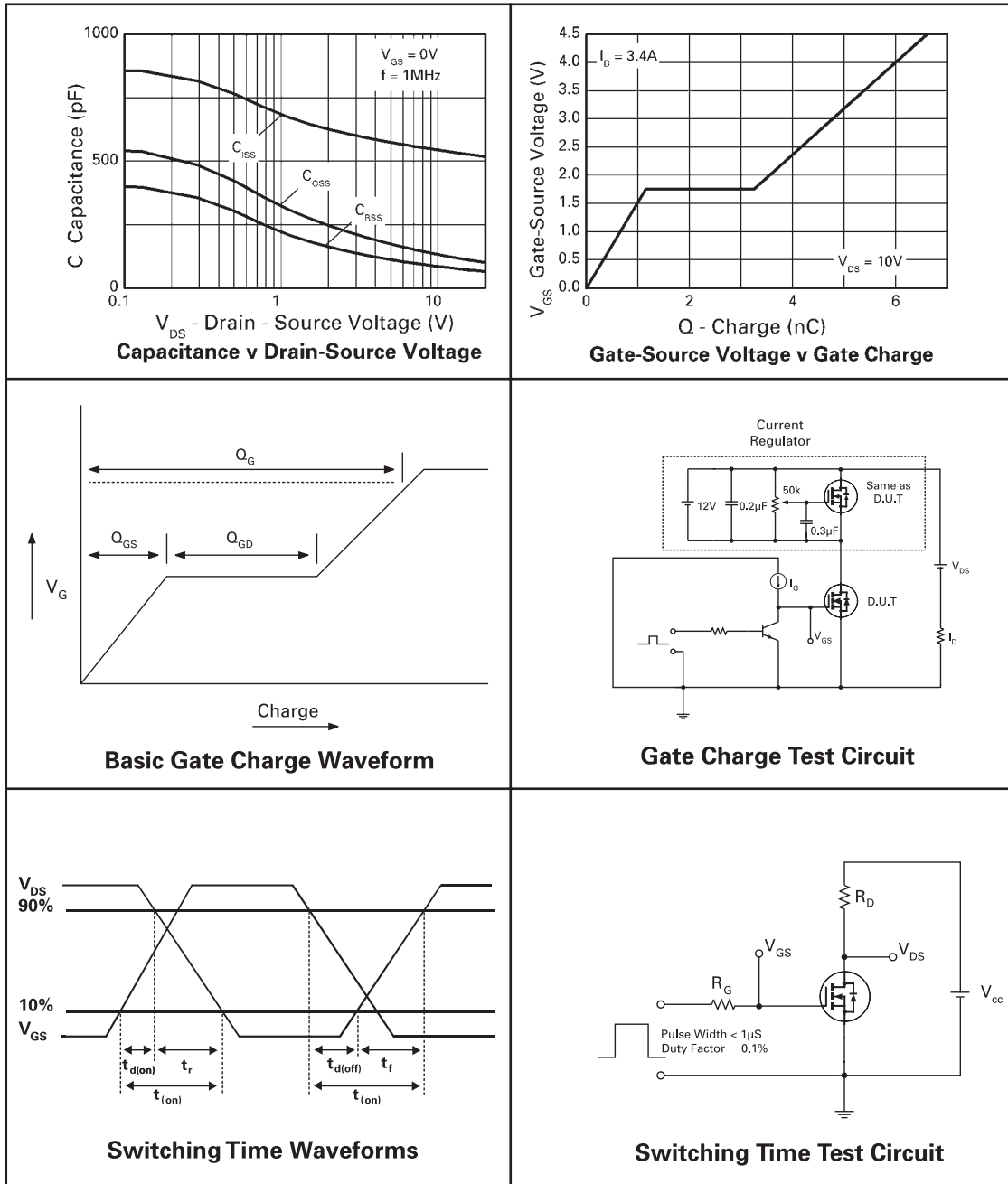
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TYPICAL CHARACTERISTICS



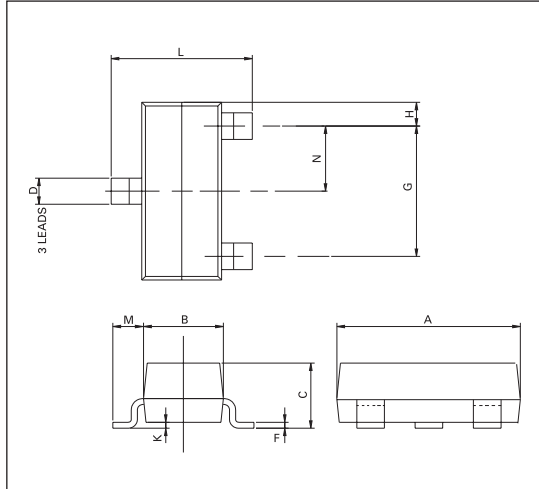
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TYPICAL CHARACTERISTICS

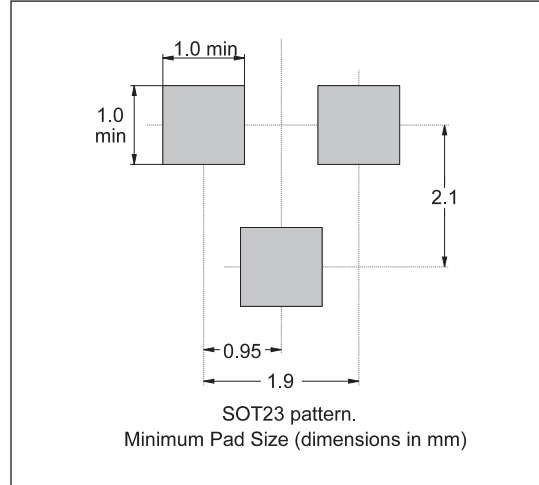


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PACKAGE OUTLINE



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

Zetex plc
 Fields New Road
 Chadderton
 Oldham, OL9 8NP
 United Kingdom
 Telephone (44) 161 622 4444
 Fax: (44) 161 622 4446
 hq@zetex.com

Zetex GmbH
 Streitfeldstraße 19
 D-81673 München
 Germany
 Telefon: (49) 89 45 49 49 0
 Fax: (49) 89 45 49 49 49
 europe.sales@zetex.com

Americas

Zetex Inc
 700 Veterans Memorial Hwy
 Hauppauge, NY 11788
 USA
 Telephone: (1) 631 360 2222
 Fax: (1) 631 360 8222
 usa.sales@zetex.com

Asia Pacific

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

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