## 20V N-CHANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

V<sub>(BR)DSS</sub>= 20V : R<sub>DS</sub>(<sub>on</sub>)=0.06Ω; I<sub>D</sub>= 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.

### **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**

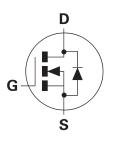
DEVICE	REEL	TAPE	QUANTITY
	SIZE	WIDTH	PER REEL
ZXMN2A14FTA	7″	8mm	3000 units

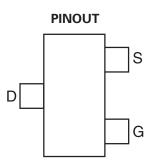
### **DEVICE MARKING**

• 214

**ISSUE 3 - SEPTEMBER 2007** 

**SOT23** 







## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current @ $V_{GS}$ =4.5V; T <sub>A</sub> =25°C <sup>(b)</sup>	I <sub>D</sub>	4.1	А
@ $V_{GS}=4.5V$ ; $T_A=70^{\circ}C$ <sup>(b)</sup> @ $V_{GS}=4.5V$ ; $T_A=25^{\circ}C$ <sup>(a)</sup>		3.3	А
@ $V_{GS}$ =4.5V; $T_{A}$ =25°C <sup>(a)</sup>		3.4	А
Pulsed Drain Current <sup>(c)</sup>	I <sub>DM</sub>	19	A
Continuous Source Current (Body Diode) <sup>(b)</sup>	I <sub>S</sub>	1.7	A
Pulsed Source Current (Body Diode) <sup>(c)</sup>	I <sub>SM</sub>	19	A
Power Dissipation at $T_A = 25^{\circ}C^{(a)}$	P <sub>D</sub>	1	W
Linear Derating Factor		8	mW/°C
Power Dissipation at T <sub>A</sub> =25°C <sup>(b)</sup>	P <sub>D</sub>	1.5	W
Linear Derating Factor		12	mW/°C
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 to +150	°C

### THERMAL RESISTANCE

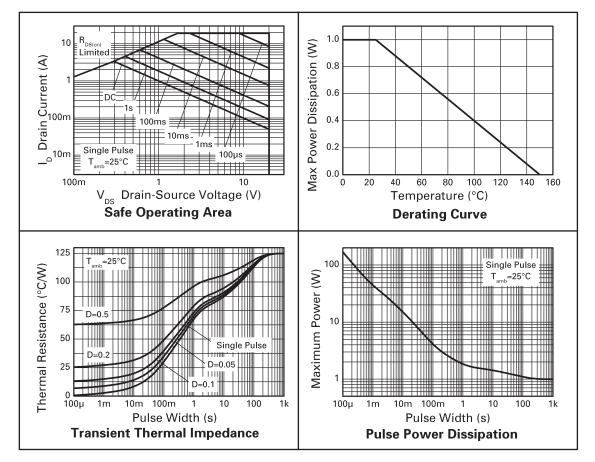
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient <sup>(a)</sup>	$R_{\Theta JA}$	125	°C/W
Junction to Ambient <sup>(b)</sup>	$R_{\Theta JA}$	82	°C/W

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.





## CHARACTERISTICS



PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS	
STATIC							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	20			V	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>			1	μA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	
Gate-Body Leakage	I <sub>GSS</sub>			100	nA	$V_{GS}=\pm 12V, V_{DS}=0V$	
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	0.7			V	I <sub>D</sub> =250μA, V <sub>DS</sub> = V <sub>GS</sub>	
Static Drain-Source On-State	R <sub>DS(on)</sub>			0.060	Ω	V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.4A	
Resistance <sup>(1)</sup>				0.110	Ω	V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.5A	
Forward Transconductance (1) (3)	g <sub>fs</sub>		9.4		S	V <sub>DS</sub> =10V,I <sub>D</sub> =3.4A	
DYNAMIC <sup>(3)</sup>	·						
Input Capacitance	Ciss		544		рF		
Output Capacitance	C <sub>oss</sub>		132		рF	V <sub>DS</sub> = 10V, V <sub>GS</sub> =0V,	
Reverse Transfer Capacitance	C <sub>rss</sub>		85		рF	f=1MHz	
SWITCHING <sup>(2) (3)</sup>							
Turn-On Delay Time	t <sub>d(on)</sub>		4.0		ns		
Rise Time	t <sub>r</sub>		5.3		ns	V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4.5V	
Turn-Off Delay Time	t <sub>d(off)</sub>		16.6		ns	I <sub>D</sub> = 1A	
Fall Time	t <sub>f</sub>		9.5		ns	$R_{G} \cong 6.0\Omega$	
Total Gate Charge	Qg		6.6		nC		
Gate-Source Charge	Q <sub>gs</sub>		1.2		nC	V <sub>DS</sub> =10V,V <sub>GS</sub> = 4.5V,	
Gate-Drain Charge	Q <sub>gd</sub>		2.1		nC	I <sub>D</sub> =3.4A	
SOURCE-DRAIN DIODE	I		1				
Diode Forward Voltage <sup>(1)</sup>	V <sub>SD</sub>		0.85	0.95	V	T <sub>J</sub> =25°C, I <sub>S</sub> =(3.3)A,	
						V <sub>GS</sub> =0V	
Reverse Recovery Time <sup>(3)</sup>	t <sub>rr</sub>		11.4		ns	T <sub>J</sub> =25°C, I <sub>F</sub> =(1.7)A,	
Reverse Recovery Charge <sup>(3)</sup>	Q <sub>rr</sub>		4.6		nC	di/dt= 100A/µs	

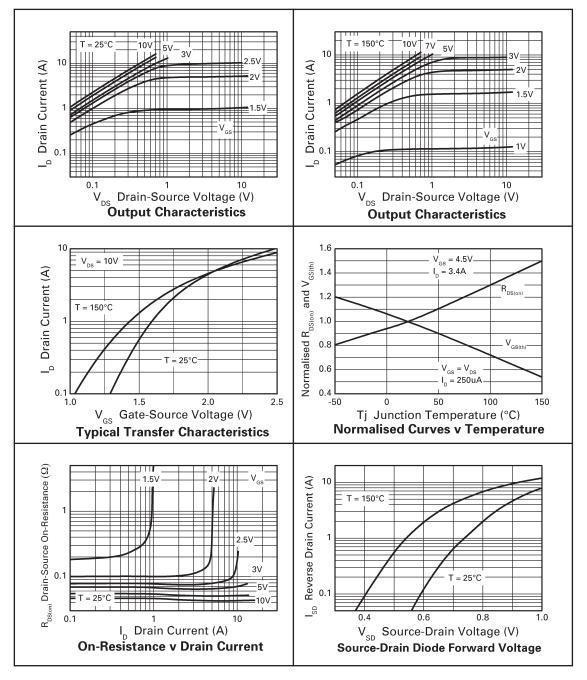
### NOTES

(1) Measured under pulsed conditions. Pulse width  $\leq 300 \mu s;$  duty cycle  ${\leq}2\%.$ 

(2) Switching characteristics are independent of operating junction temperature.

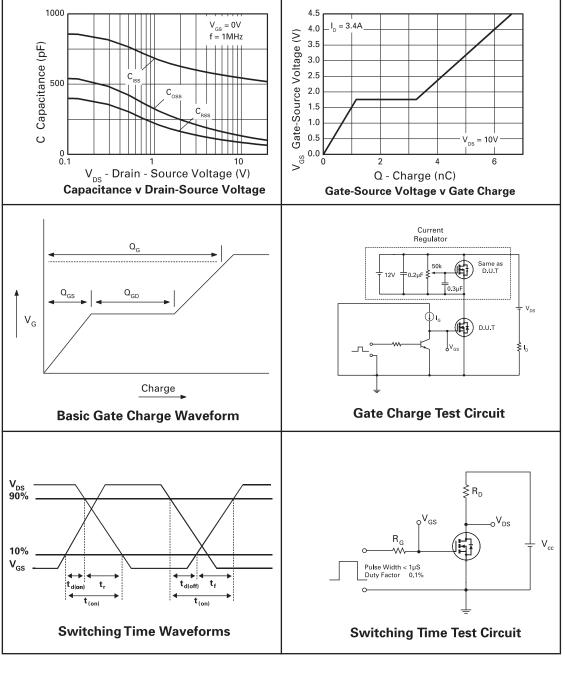
(3) For design aid only, not subject to production testing.





## **TYPICAL CHARACTERISTICS**





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## **TYPICAL CHARACTERISTICS**



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Datasheet status key:

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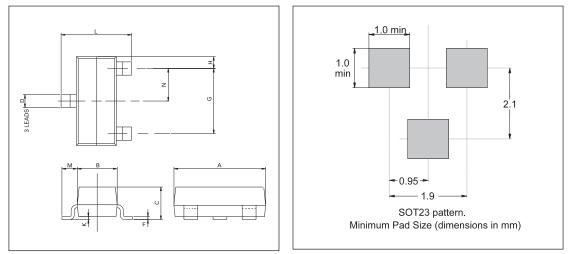
information, which may change in any manner without notice.

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## PACKAGE OUTLINE



PAD LAYOUT

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

## PACKAGE DIMENSIONS

	MILLIN	IETRES	INC	HES		MILLIN	IETRES	INC	HES
DIM	MIN	MAX	MIN	MAX	DIM	MIN	MAX	MIN	MAX
Α	2.67	3.05	0.105	0.120	Н	0.33	0.51	0.013	0.020
В	1.20	1.40	0.047	0.055	К	0.01	0.10	0.0004	0.004
С	_	1.10	_	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	М	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	Ν	0.95	NOM	0.0375	5 NOM
G	1.90	NOM	0.075	NOM	θ	10°	ТҮР	10°	ТҮР

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