

# ZXMN3B14F

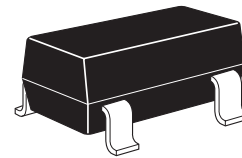
## 30V N-CANNEL ENHANCEMENT MODE MOSFET 2.5V GATE DRIVE

### SUMMARY

$V_{(BR)DSS}=30V$  ;  $R_{DS(on)}=0.08\Omega$ ;  $I_D=3.5A$

### 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.



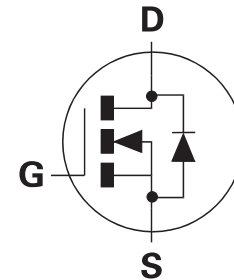
PACKAGE

### FEATURES

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

### APPLICATIONS

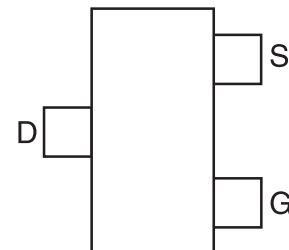
- DC-DC converters
- Power management functions
- Disconnect switches
- Motor control



### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3B14FTA	7"	8mm	3,000 units
ZXMN3B14FTC	13"	8mm	10,000 units

PINOUT



### DEVICE MARKING

- 3B4

ISSUE 2 - JANUARY 2006

# ZXMN3B14F

## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current @ $V_{GS} = 4.5V$ ; $T_A = 25^\circ C$ <sup>(b)</sup> @ $V_{GS} = 4.5V$ ; $T_A = 70^\circ C$ <sup>(b)</sup> @ $V_{GS} = 4.5V$ ; $T_A = 25^\circ C$ <sup>(a)</sup>	$I_D$	3.5 2.9 2.9	A A A
Pulsed Drain Current <sup>(c)</sup>	$I_{DM}$	16	A
Continuous Source Current (Body Diode) <sup>(b)</sup>	$I_S$	2.4	A
Pulsed Source Current (Body Diode) <sup>(c)</sup>	$I_{SM}$	16	A
Power Dissipation at $T_A = 25^\circ C$ <sup>(a)</sup>	$P_D$	1	W
Linear Derating Factor		8	mW/ $^\circ C$
Power Dissipation at $T_A = 25^\circ C$ <sup>(b)</sup>	$P_D$	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 <sup>(a)</sup>	$R_{\theta JA}$	125	$^\circ C/W$
Junction to Ambient <sup>(b)</sup>	$R_{\theta JA}$	83	$^\circ C/W$

### NOTES

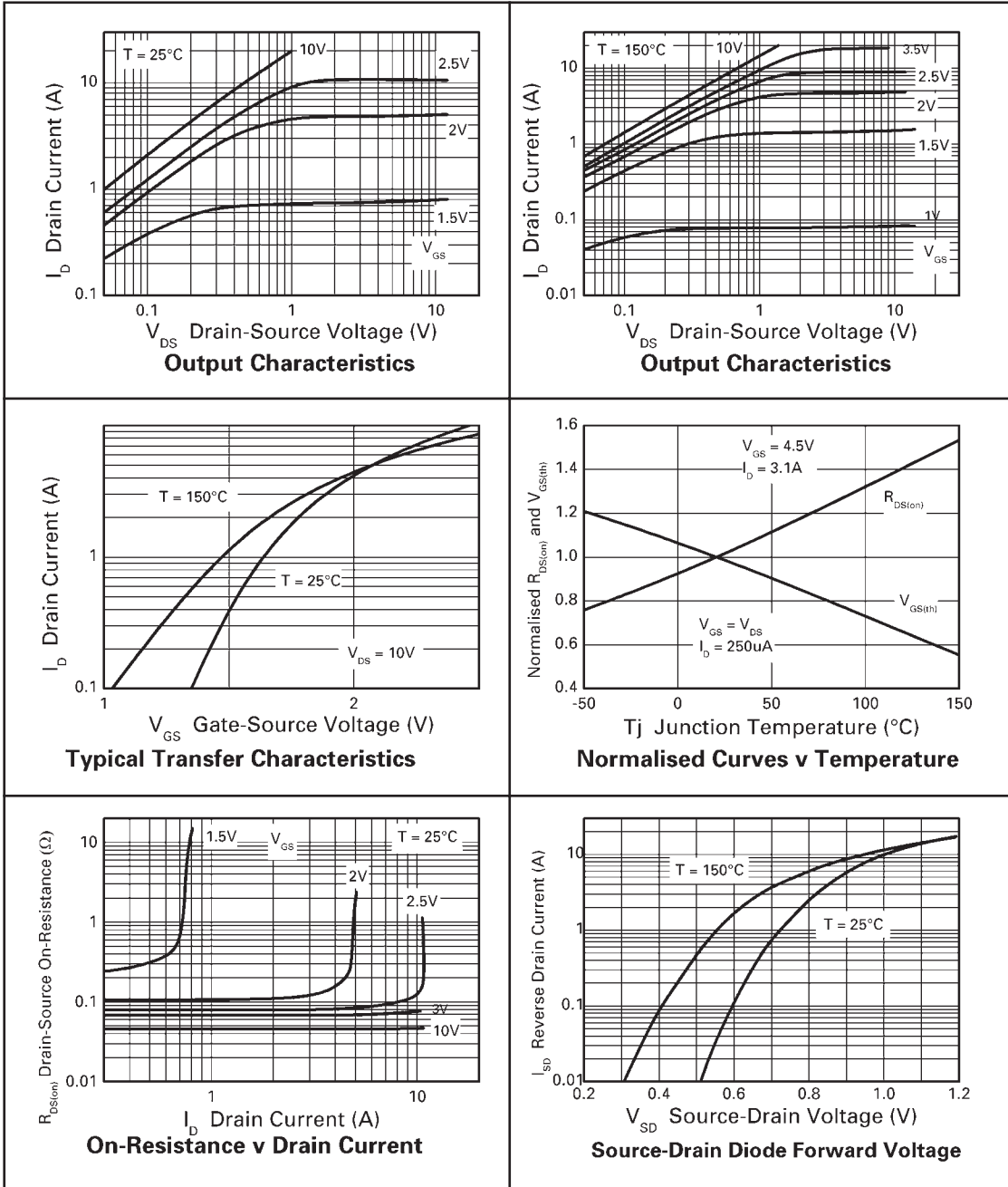
- (a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.  
 (b) For a device surface mounted on FR4 PCB measured at  $t \leq 5$  sec.  
 (c) Repetitive rating - 25mm x 25mm FR4 PCB,  $D=0.02$ , pulse width 300 $\mu s$  - pulse width limited by maximum junction temperature.



ISSUE 2 - JANUARY 2006

# ZXMN3B14F

## TYPICAL CHARACTERISTICS



# ZXMN3B14F

## 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	$V_{(BR)DSS}$	30			V	$I_D = 250\mu\text{A}$ , $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			1	$\mu\text{A}$	$V_{DS} = 30\text{V}$ , $V_{GS} = 0\text{V}$
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>	$R_{DS(on)}$			0.080	$\Omega$	$V_{GS} = 4.5\text{V}$ , $I_D = 3.1\text{A}$
				0.140	$\Omega$	$V_{GS} = 2.5\text{V}$ , $I_D = 2.2\text{A}$
Forward Transconductance <sup>(1) (3)</sup>	$g_{fs}$		8.5		S	$V_{DS} = 15\text{V}$ , $I_D = 3.1\text{A}$
<b>DYNAMIC <sup>(3)</sup></b>						
Input Capacitance	$C_{iss}$		568		pF	$V_{DS} = 15\text{V}$ , $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$		101		pF	
Reverse Transfer Capacitance	$C_{rss}$		66		pF	
<b>SWITCHING <sup>(2) (3)</sup></b>						
Turn-On-Delay Time	$t_{d(on)}$		3.6		ns	$V_{DD} = 15\text{V}$ , $V_{GS} = 4.5\text{V}$ $I_D = 1\text{A}$ $R_G \cong 6.0\Omega$
Rise Time	$t_r$		4.9		ns	
Turn-Off Delay Time	$t_{d(off)}$		17.3		ns	
Fall Time	$t_f$		9.8		ns	
Total Gate Charge	$Q_g$		6.7		nC	$V_{DS} = 15\text{V}$ , $V_{GS} = 4.5\text{V}$ $I_D = 3.1\text{A}$
Gate-Source Charge	$Q_{gs}$		1.4		nC	
Gate Drain Charge	$Q_{gd}$		1.8		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage <sup>(1)</sup>	$V_{SD}$		0.82	0.95	V	$T_j = 25^{\circ}\text{C}$ , $I_S = 3.1\text{A}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time <sup>(3)</sup>	$t_{rr}$		10.8		ns	$T_j = 25^{\circ}\text{C}$ , $I_F = 1.6\text{A}$ ,
Reverse Recovery Charge <sup>(3)</sup>	$Q_{rr}$		4.54		nC	$di/dt = 100\text{A}/\mu\text{s}$

### NOTES

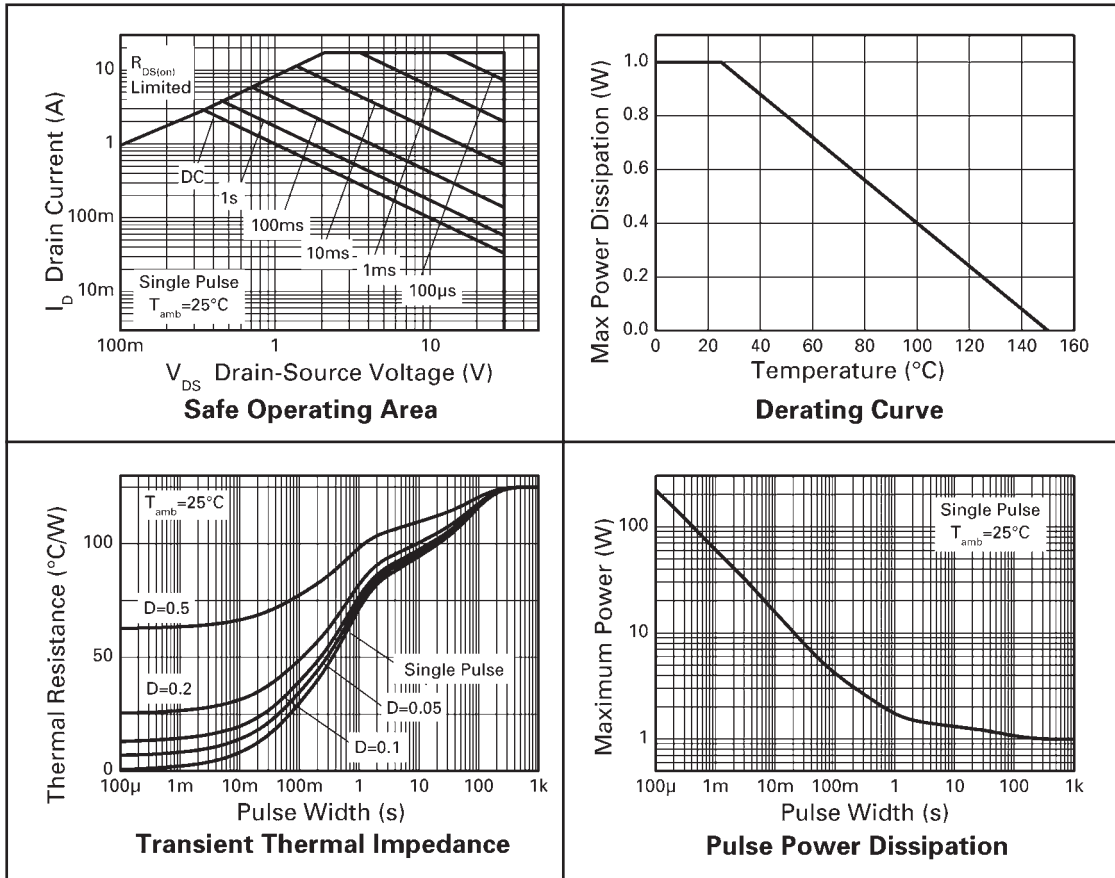
- (1) Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .  
 (2) Switching characteristics are independent of operating junction temperature.  
 (3) For design aid only, not subject to production testing.



ISSUE 2 - JANUARY 2006

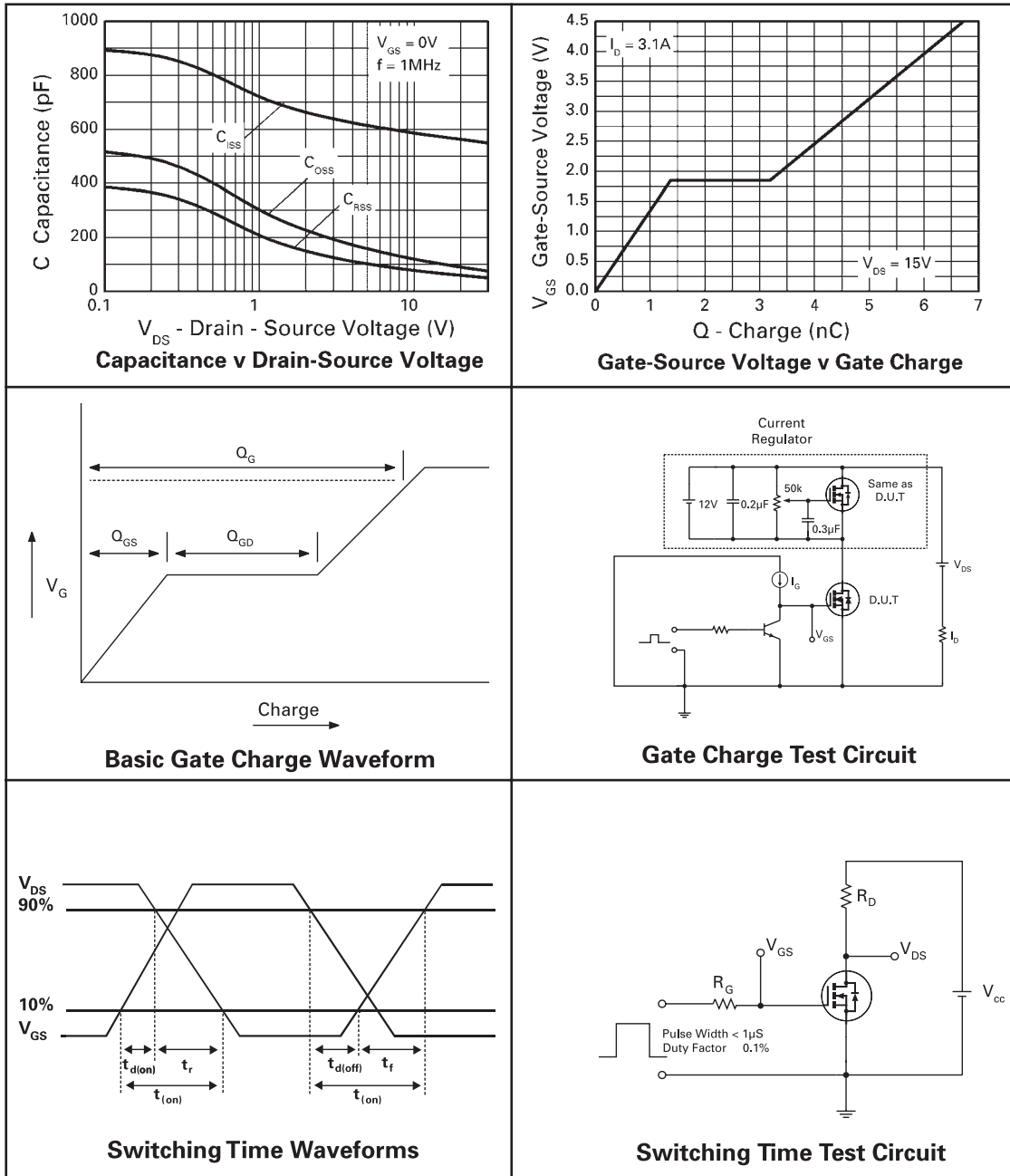
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## N-CHANNEL TYPICAL CHARACTERISTICS



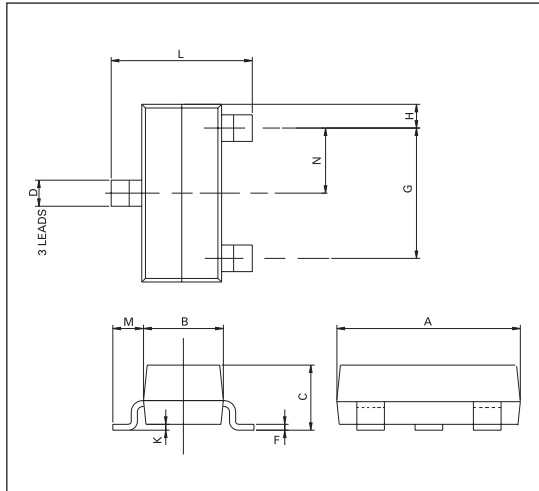
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## N-CHANNEL TYPICAL CHARACTERISTICS

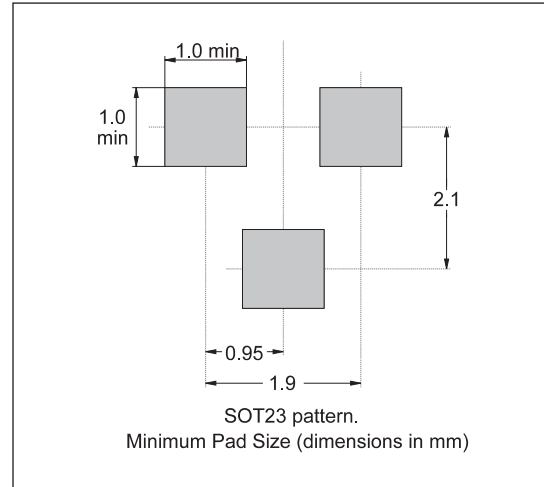


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## PACKAGE OUTLINE



## 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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ISSUE 2 - JANUARY 2006

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