

# ZXMN3A01F

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## 30V N-CHANNEL ENHANCEMENT MODE MOSFET

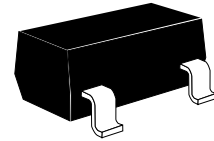
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### SUMMARY

$V_{(BR)DSS} = 30V$ ;  $R_{DS(ON)} = 0.12\Omega$   $I_D = 2.0A$

### 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.



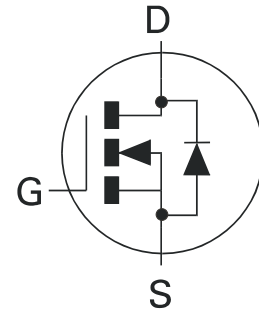
SOT23

### FEATURES

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

### APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Motor control

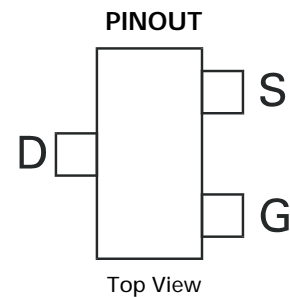


### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A01FTA	7"	8mm	3000 units
ZXMN3A01FTC	13"	8mm	10000 units

### DEVICE MARKING

- 7N3



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## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	30	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	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)	$I_D$	2.0 1.6 1.8	A
Pulsed Drain Current (c)	$I_{DM}$	8	A
Continuous Source Current (Body Diode) (b)	$I_S$	1.3	A
Pulsed Source Current (Body Diode) (c)	$I_{SM}$	8	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	$P_D$	625 5	mW mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	$P_D$	806 6.4	mW 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)	$R_{\theta JA}$	200	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	155	$^\circ C/W$

### 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  $t \leq 5$  secs.

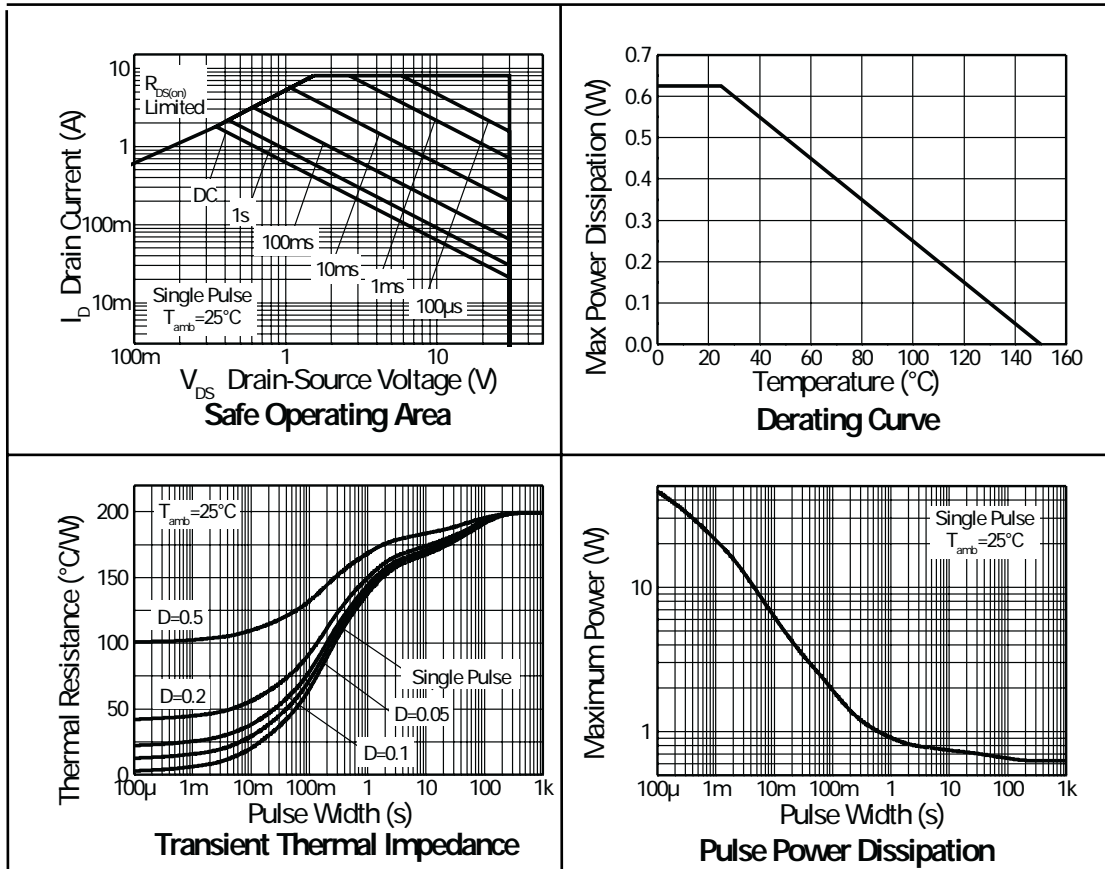
(c) Repetitive rating 25mm x 25mm FR4 PCB,  $D = 0.05$ , pulse width  $10\mu s$  - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.



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## CHARACTERISTICS



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ELECTRICAL CHARACTERISTICS (at  $T_A = 25^\circ\text{C}$  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	$I_{DSS}$			0.5	$\mu\text{A}$	$V_{DS}=30\text{V}$ , $V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 20\text{V}$ , $V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1			V	$I_D=250\mu\text{A}$ , $V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$		0.106	0.12 0.18	$\Omega$ $\Omega$	$V_{GS}=10\text{V}$ , $I_D=2.5\text{A}$ $V_{GS}=4.5\text{V}$ , $I_D=2.0\text{A}$
Forward Transconductance (1)(3)	$g_{fs}$		3.5		S	$V_{DS}=4.5\text{V}$ , $I_D=2.5\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		190		pF	$V_{DS}=25\text{V}$ , $V_{GS}=0\text{V}$ , $f=1\text{MHz}$
Output Capacitance	$C_{oss}$		38		pF	
Reverse Transfer Capacitance	$C_{rss}$		20		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		1.7		ns	$V_{DD}=15\text{V}$ , $I_D=2.5\text{A}$ , $R_G\cong 6.0\Omega$ , $V_{GS}=10\text{V}$
Rise Time	$t_r$		2.3		ns	
Turn-Off Delay Time	$t_{d(off)}$		6.6		ns	
Fall Time	$t_f$		2.9		ns	
Gate Charge	$Q_g$		2.3		nC	$V_{DS}=15\text{V}$ , $V_{GS}=5\text{V}$ , $I_D=2.5\text{A}$
Total Gate Charge	$Q_g$		3.9		nC	$V_{DS}=15\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=2.5\text{A}$
Gate-Source Charge	$Q_{gs}$		0.6		nC	
Gate-Drain Charge	$Q_{gd}$		0.9		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$		0.85	0.95	V	$T_J=25^\circ\text{C}$ , $I_S=1.7\text{A}$ , $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		17.7		ns	$T_J=25^\circ\text{C}$ , $I_F=2.5\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		13.0		nC	

**NOTES**

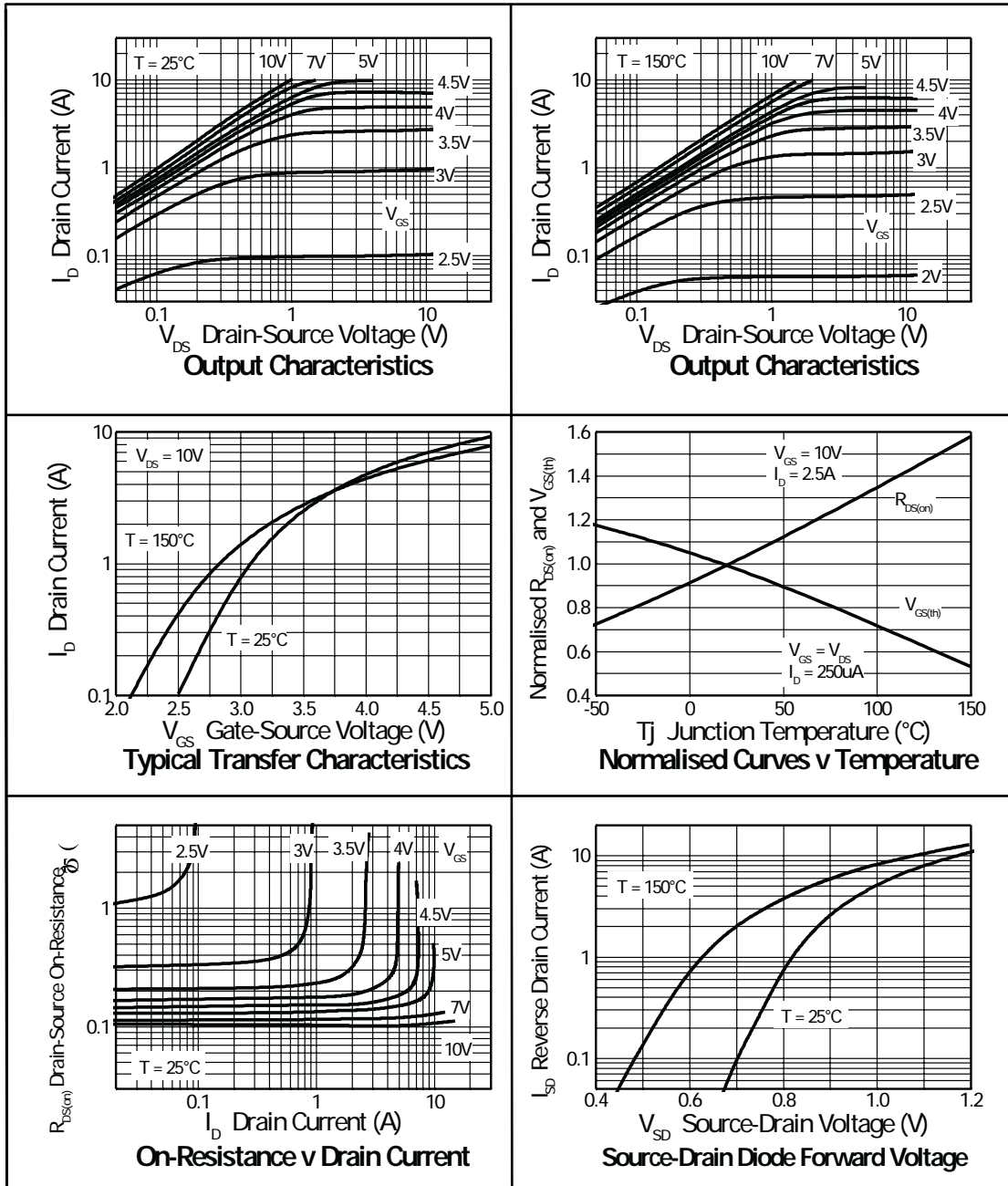
- (1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.



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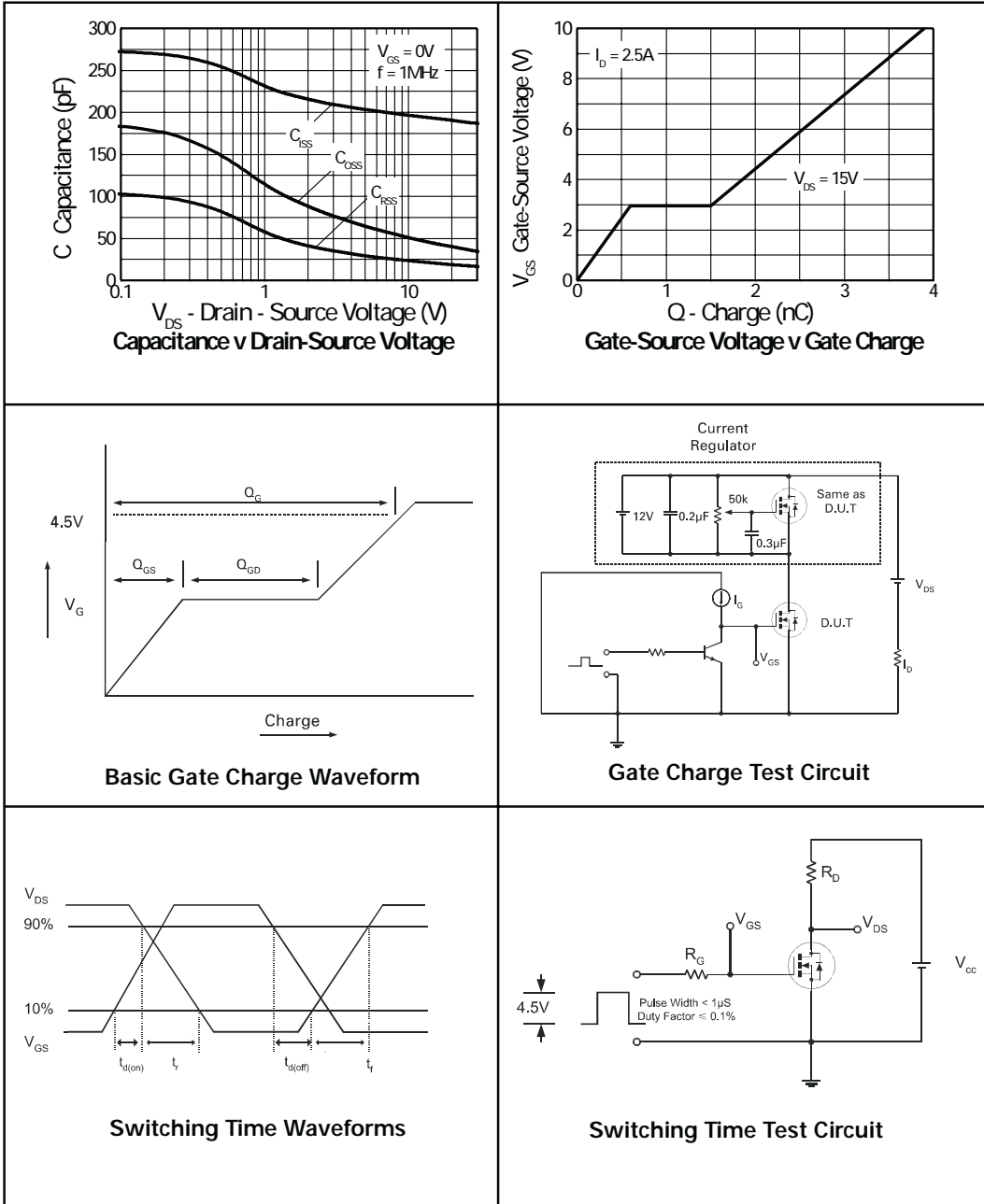
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## TYPICAL CHARACTERISTICS



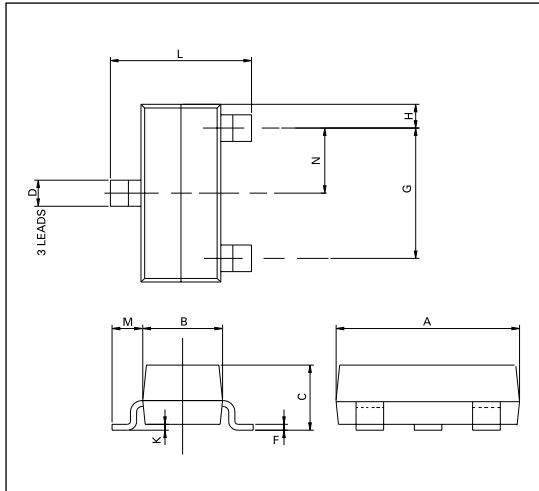
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## TYPICAL CHARACTERISTICS

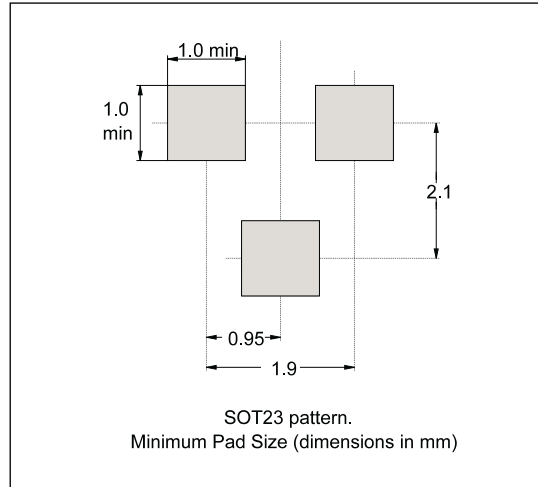


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## PACKAGE OUTLINE



## PAD LAYOUT



CONTROLLING DIMENSIONS IN MILLIMETRES APPROX CONVERSIONS 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		φ	10° TYP		10° TYP	

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