

**30V N-CHANNEL ENHANCEMENT MODE MOSFET****SUMMARY** **$V_{(BR)DSS}=30V$ ;  $R_{DS(ON)}=0.22\Omega$ ;  $I_D=1.4A$** **DESCRIPTION**

This new generation of high density MOSFETs from Zetex utilises 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**

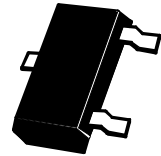
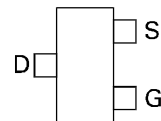
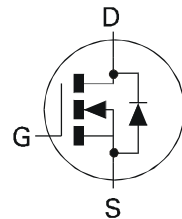
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

**ORDERING INFORMATION**

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61N03FTA	7	8mm embossed	3000 units
ZXM61N03FTC	13	8mm embossed	10000 units

**DEVICE MARKING**

- N03

**SOT23**

Top View

# ZXM61N03F

## 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)	$I_D$	1.4 1.1	A
Pulsed Drain Current (c)	$I_{DM}$	7.3	A
Continuous Source Current (Body Diode) (b)	$I_S$	0.8	A
Pulsed Source Current (Body Diode)	$I_{SM}$	7.3	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	$^\circ C/W$

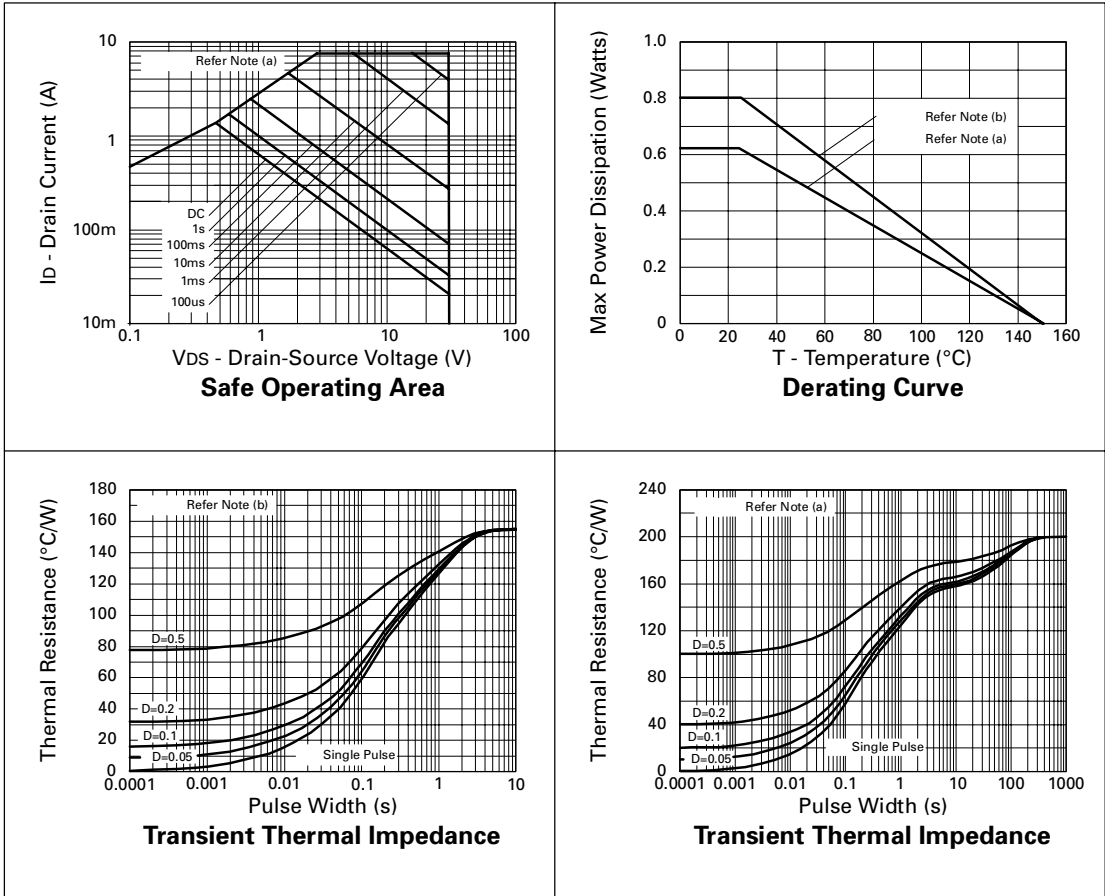
### NOTES

(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 - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

## CHARACTERISTICS



# ZXM61N03F

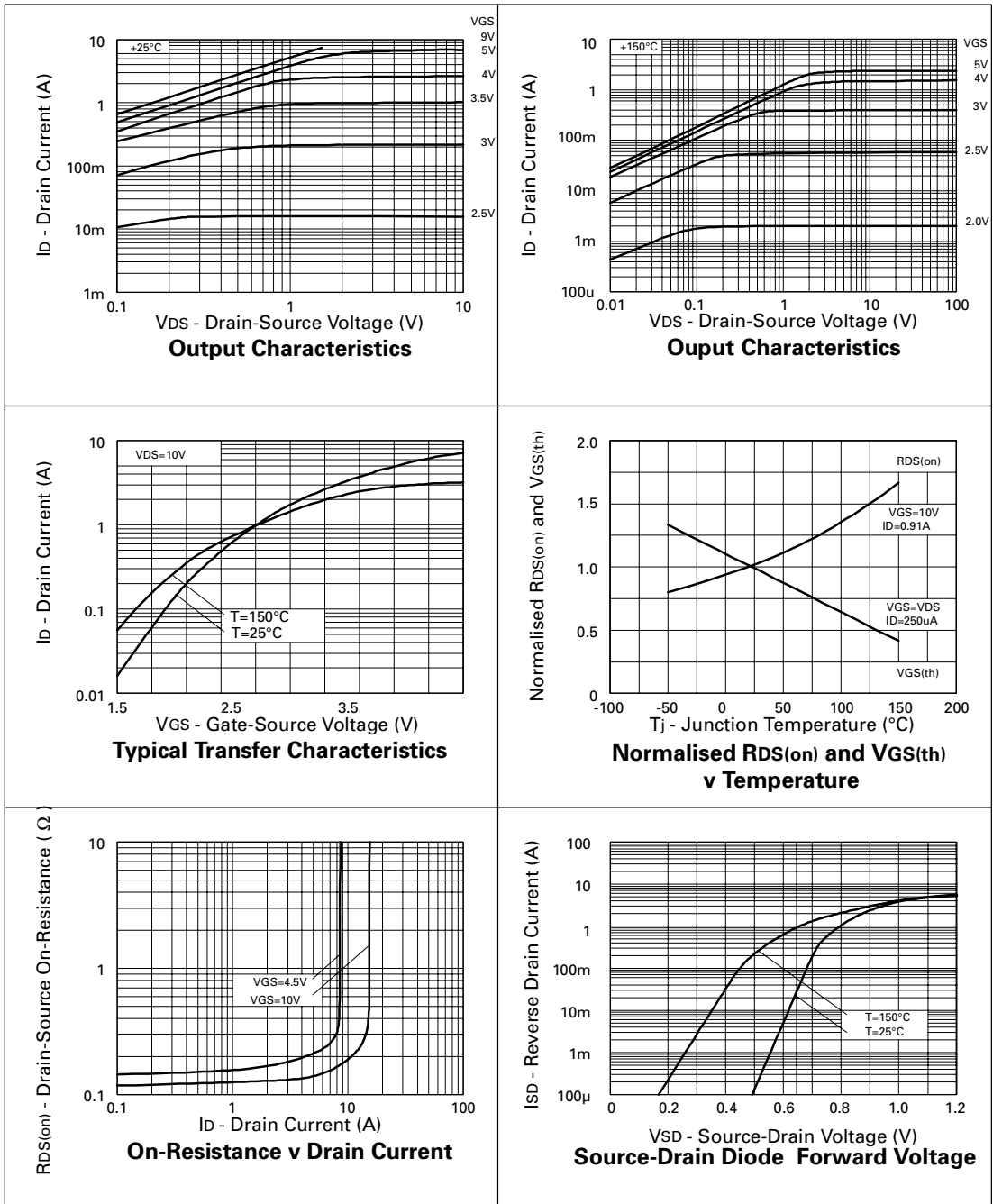
## ELECTRICAL CHARACTERISTICS (at $T_A = 25^\circ\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.(3)	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	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			V	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.22 0.30	$\Omega$ $\Omega$	$V_{GS}=10\text{V}, I_D=0.91\text{A}$ $V_{GS}=4.5\text{V}, I_D=0.46\text{A}$
Forward Transconductance (3)	$g_{fs}$	0.87			S	$V_{DS}=10\text{V}, I_D=0.46\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		150		pF	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$		35		pF	
Reverse Transfer Capacitance	$C_{rss}$		15		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		1.9		ns	$V_{DD}=15\text{V}, I_D=0.91\text{A}$ $R_G=6.2\Omega, R_D=16\Omega$ (refer to test circuit)
Rise Time	$t_r$		2.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		5.8		ns	
Fall Time	$t_f$		3.0		ns	
Total Gate Charge	$Q_g$			4.1	nC	$V_{DS}=24\text{V}, V_{GS}=10\text{V},$ $I_D=0.91\text{A}$ (refer to test circuit)
Gate-Source Charge	$Q_{gs}$			0.4	nC	
Gate-Drain Charge	$Q_{gd}$			0.63	nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			0.95	V	$T_J=25^\circ\text{C}, I_S=0.91\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		11.0		ns	$T_J=25^\circ\text{C}, I_F=0.91\text{A},$ $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		3.5		nC	

### NOTES

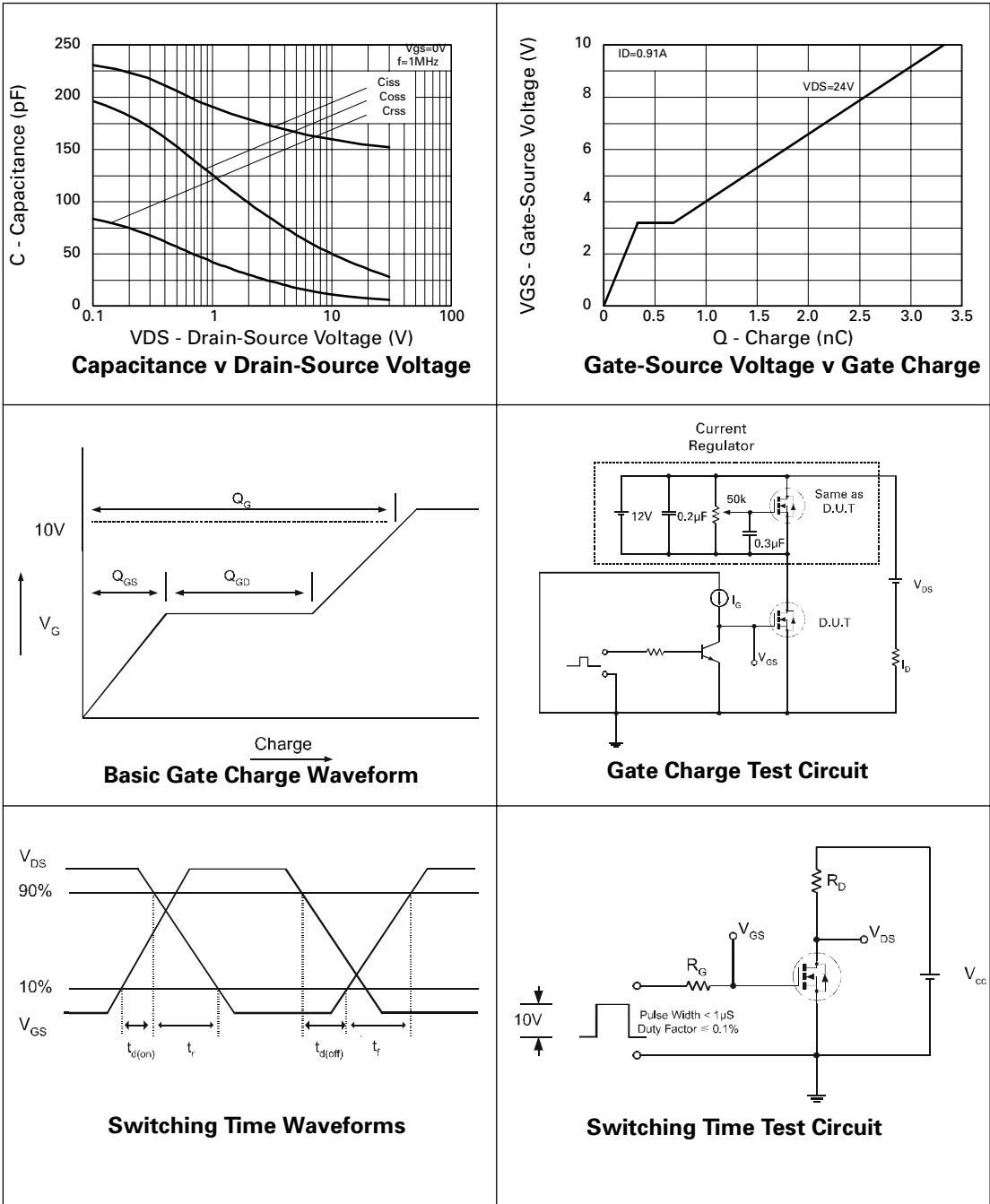
- (1) Measured under pulsed conditions. Width $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$  .  
 (2) Switching characteristics are independent of operating junction temperature.  
 (3) For design aid only, not subject to production testing.

## TYPICAL CHARACTERISTICS



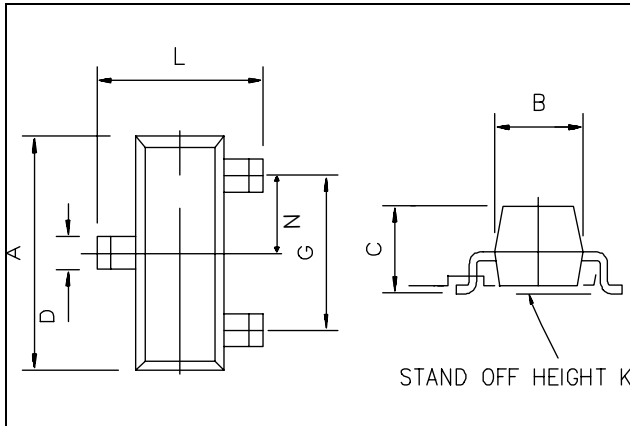
# ZXM61N03F

## TYPICAL CHARACTERISTICS



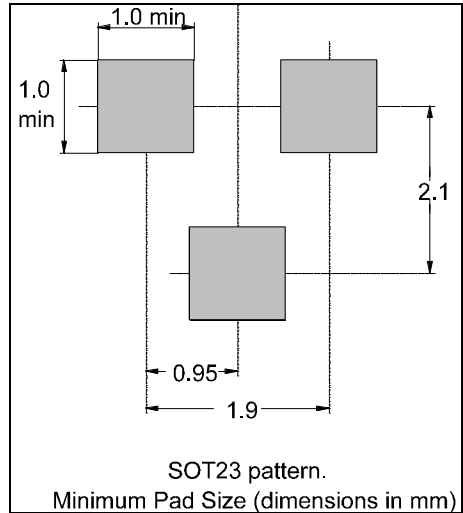
# ZXM61N03F

## PACKAGE DIMENSIONS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	2.67	3.05	0.105	0.120
B	1.20	1.40	0.047	0.055
C	-	1.10	-	0.043
D	0.37	0.53	0.0145	0.021
F	0.085	0.15	0.0033	0.0059
G	NOM 1.9		NOM 0.075	
K	0.01	0.10	0.0004	0.004
L	2.10	2.50	0.0825	0.0985
N	NOM 0.95		NOM 0.037	

## PAD LAYOUT DETAILS



**ZETEX** Zetex plc.  
Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.  
Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)  
Fax: (44)161 622 4420

Zetex GmbH  
Streitfeldstraße 19  
D-81673 München  
Germany  
Telephone: (49) 89 45 49 49 0  
Fax: (49) 89 45 49 49 49

Zetex Inc.  
47 Mall Drive, Unit 4  
Commack NY 11725  
USA  
Telephone: (516) 543-7100  
Fax: (516) 864-7630

Zetex (Asia) Ltd.  
3510 Metroplaza, Tower 2  
Hing Fong Road,  
Kwai Fong, Hong Kong  
Telephone: (852) 26100 611  
Fax: (852) 24250 494

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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

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