

**20V P-CHANNEL ENHANCEMENT MODE MOSFET****SUMMARY** **$V_{(BR)DSS}=-20V$ ;  $R_{DS(ON)}=0.60\Omega$ ;  $I_D=-0.9A$** **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**

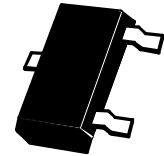
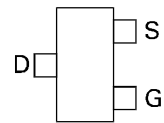
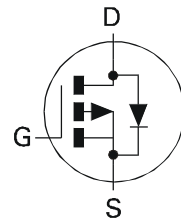
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

**ORDERING INFORMATION**

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61P02FTA	7	8mm embossed	3000 units
ZXM61P02FTC	13	8mm embossed	10000 units

**DEVICE MARKING**

- P02

**SOT23**

Top View

# ZXM61P02F

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	-20	V
Gate- Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current ( $V_{GS}=4.5V$ ; $T_A=25^\circ C$ )(b) ( $V_{GS}=4.5V$ ; $T_A=70^\circ C$ )(b)	$I_D$	-0.9 -0.7	A
Pulsed Drain Current (c)	$I_{DM}$	-4.9	A
Continuous Source Current (Body Diode)(b)	$I_S$	-0.9	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	-4.9	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	$^\circ C/W$

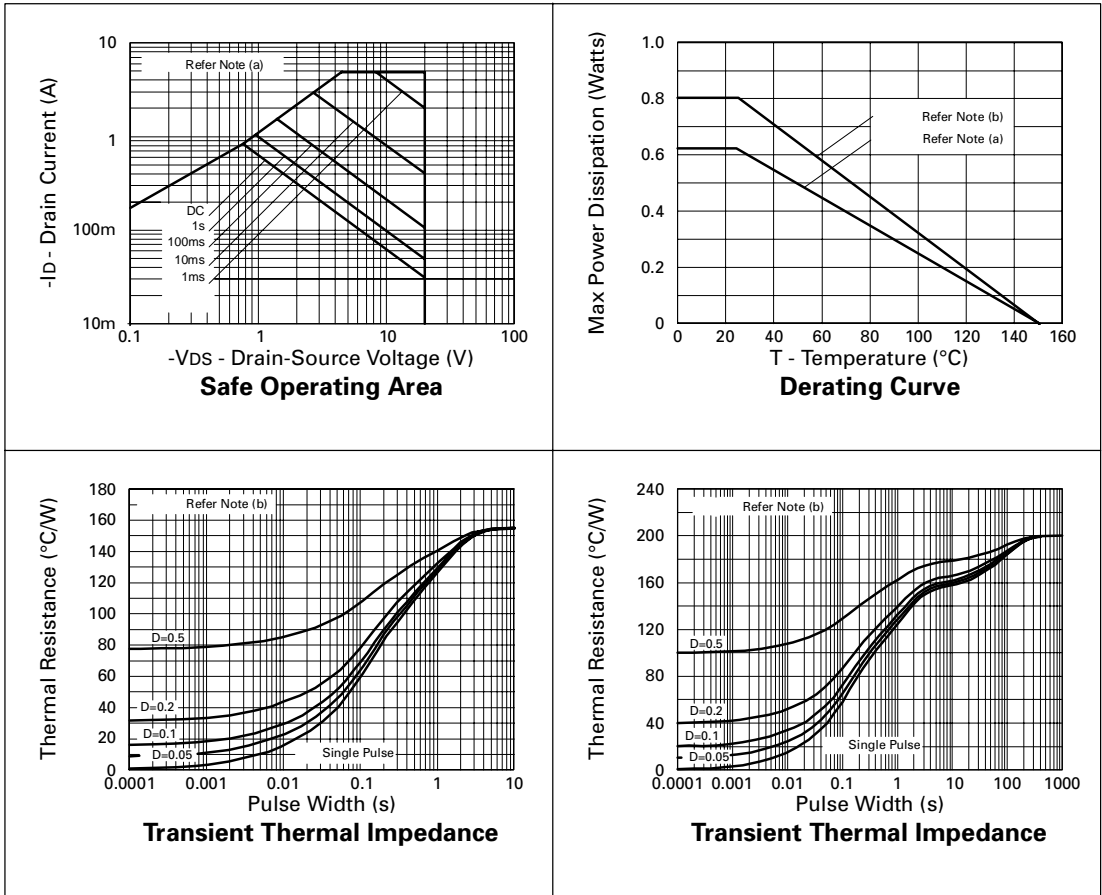
### NOTES

(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



# ZXM61P02F

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

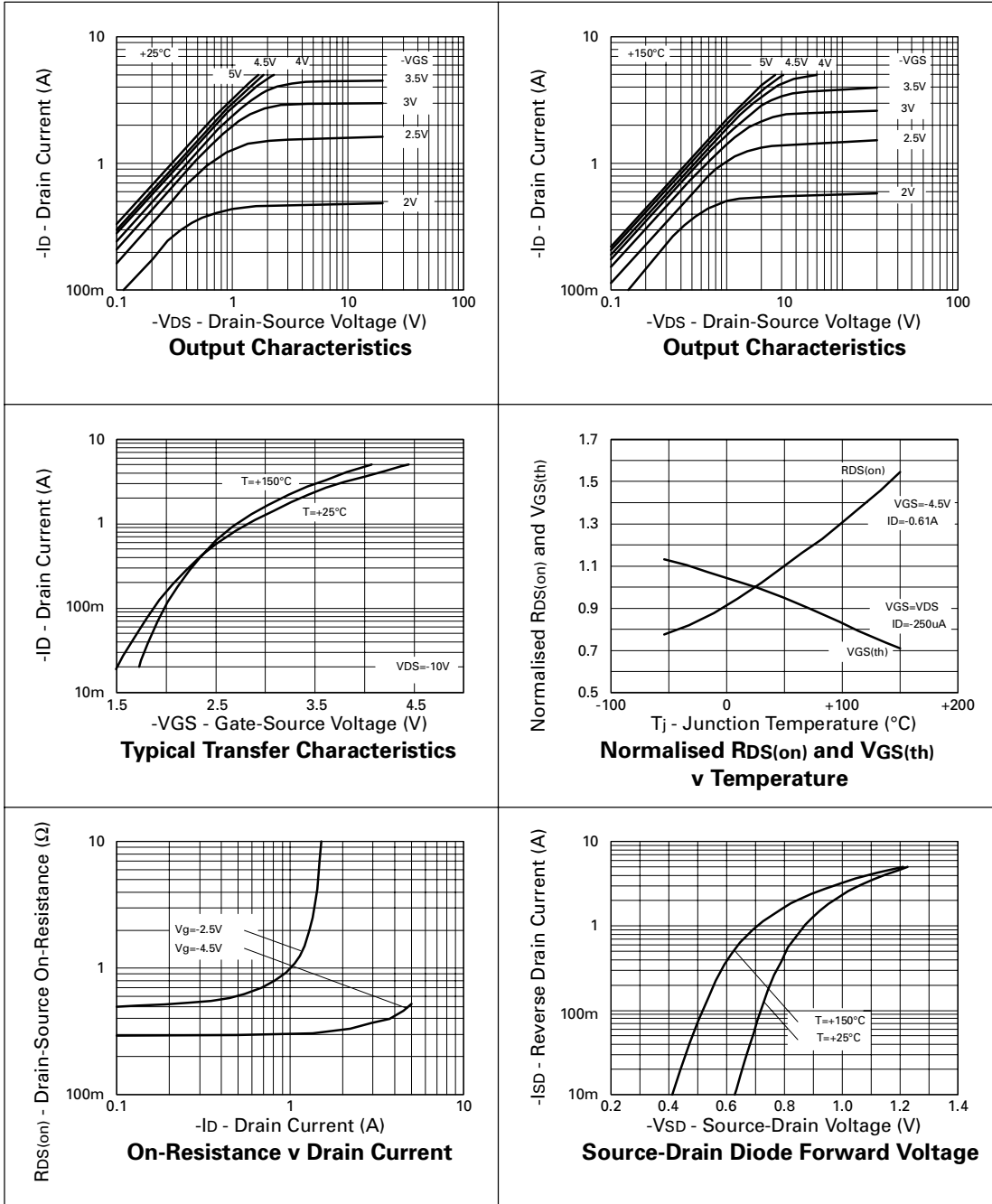
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-20			V	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			-1	$\mu\text{A}$	$V_{DS} = -20\text{V}$ , $V_{GS} = 0\text{V}$
Gate-Body Leakage	$I_{GSS}$			$\pm 100$	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 (1)	$R_{DS(on)}$			0.6 0.9	$\Omega$ $\Omega$	$V_{GS} = -4.5\text{V}$ , $I_D = -0.61\text{A}$ $V_{GS} = -2.7\text{V}$ , $I_D = -0.31\text{A}$
Forward Transconductance (3)	$g_{fs}$	0.56			S	$V_{DS} = -10\text{V}$ , $I_D = -0.31\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		150		pF	$V_{DS} = -15\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$		70		pF	
Reverse Transfer Capacitance	$C_{riss}$		30		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		2.9		ns	$V_{DD} = -10\text{V}$ , $I_D = -0.93\text{A}$ $R_G = 6.2\Omega$ , $R_D = 11\Omega$ (Refer to test circuit)
Rise Time	$t_r$		6.7		ns	
Turn-Off Delay Time	$t_{d(off)}$		11.2		ns	
Fall Time	$t_f$		10.1		ns	
Total Gate Charge	$Q_g$			3.5	nC	$V_{DS} = -16\text{V}$ , $V_{GS} = -4.5\text{V}$ , $I_D = -0.61\text{A}$ (Refer to test circuit)
Gate-Source Charge	$Q_{gs}$			0.5	nC	
Gate Drain Charge	$Q_{gd}$			1.5	nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			-0.95	V	$T_j = 25^{\circ}\text{C}$ , $I_S = -0.61\text{A}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		14.9		ns	$T_j = 25^{\circ}\text{C}$ , $I_F = -0.61\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge(3)	$Q_{rr}$		5.6		nC	

(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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

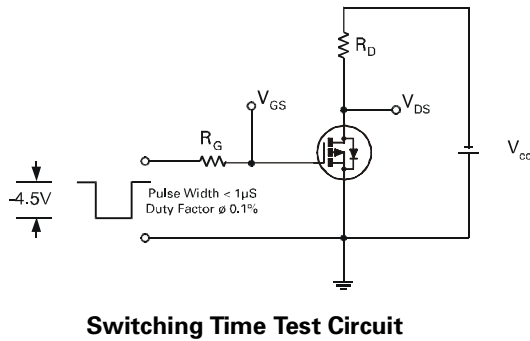
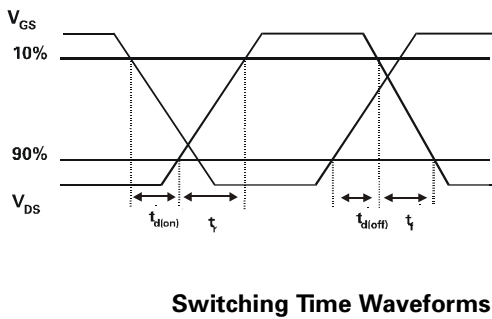
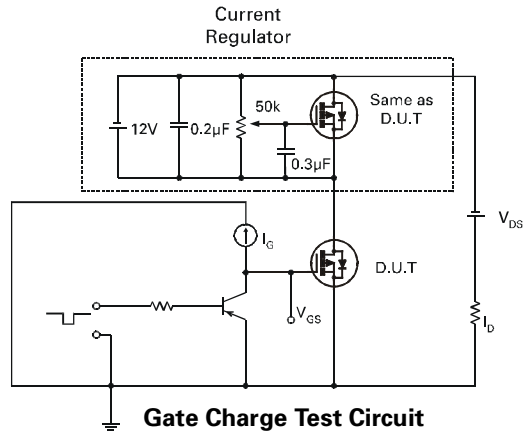
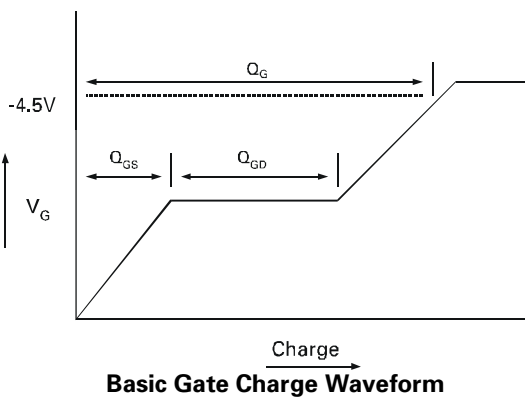
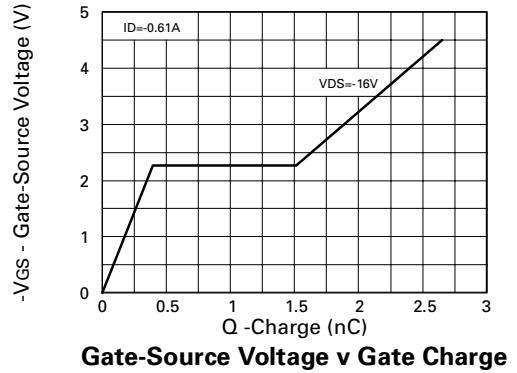
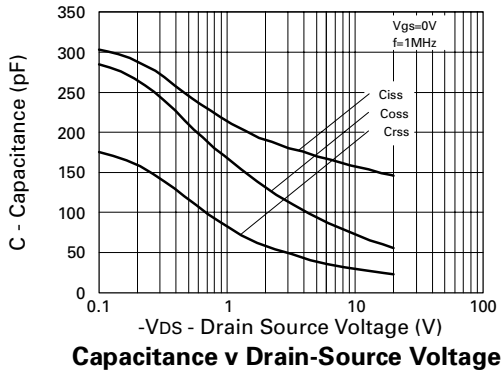
(3) For design aid only, not subject to production testing.

## TYPICAL CHARACTERISTICS



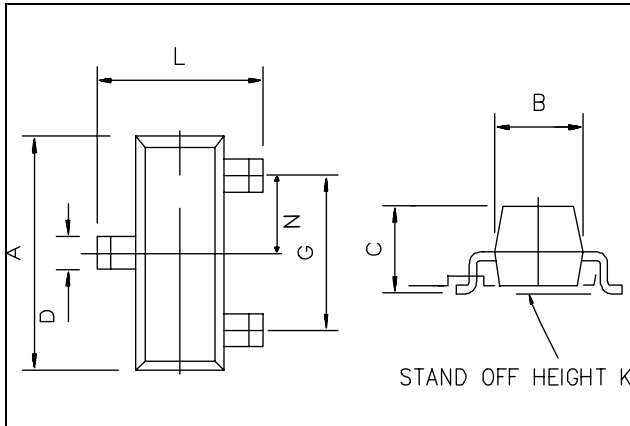
# ZXM61P02F

## TYPICAL CHARACTERISTICS



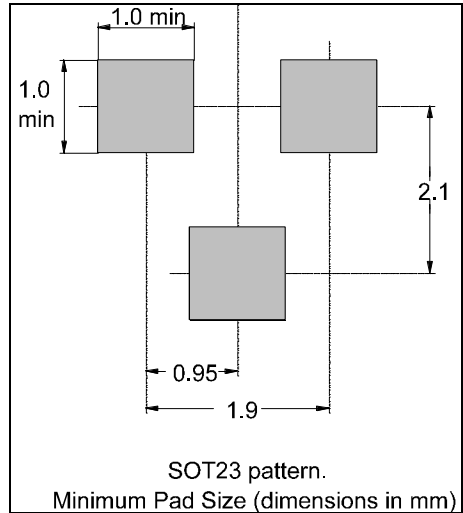
# ZXM61P02F

## 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  
 Telefon: (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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