

# ZXM61P03F

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## 30V P-CHANNEL ENHANCEMENT MODE MOSFET

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### SUMMARY

$V_{(BR)DSS} = -30V$ ;  $R_{DS(ON)} = 0.35\Omega$ ;  $I_D = -1.1A$

### DESCRIPTION

This new generation of high density 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

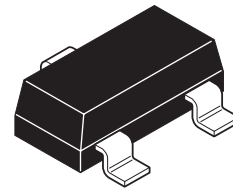
- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control

### ORDERING INFORMATION

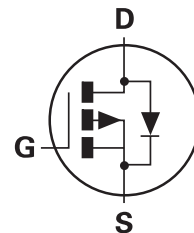
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61P03FTA	7	8 embossed	3,000
ZXM61P03FTC	13	8 embossed	10,000

### DEVICE MARKING

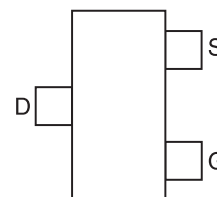
P03



SOT23



Pin out



Top view

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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)	$I_D$	-1.1 -0.9	A
Pulsed Drain Current (c)	$I_{DM}$	-4.3	A
Continuous Source Current (Body Diode)(b)	$I_S$	-0.88	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	-4.3	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:

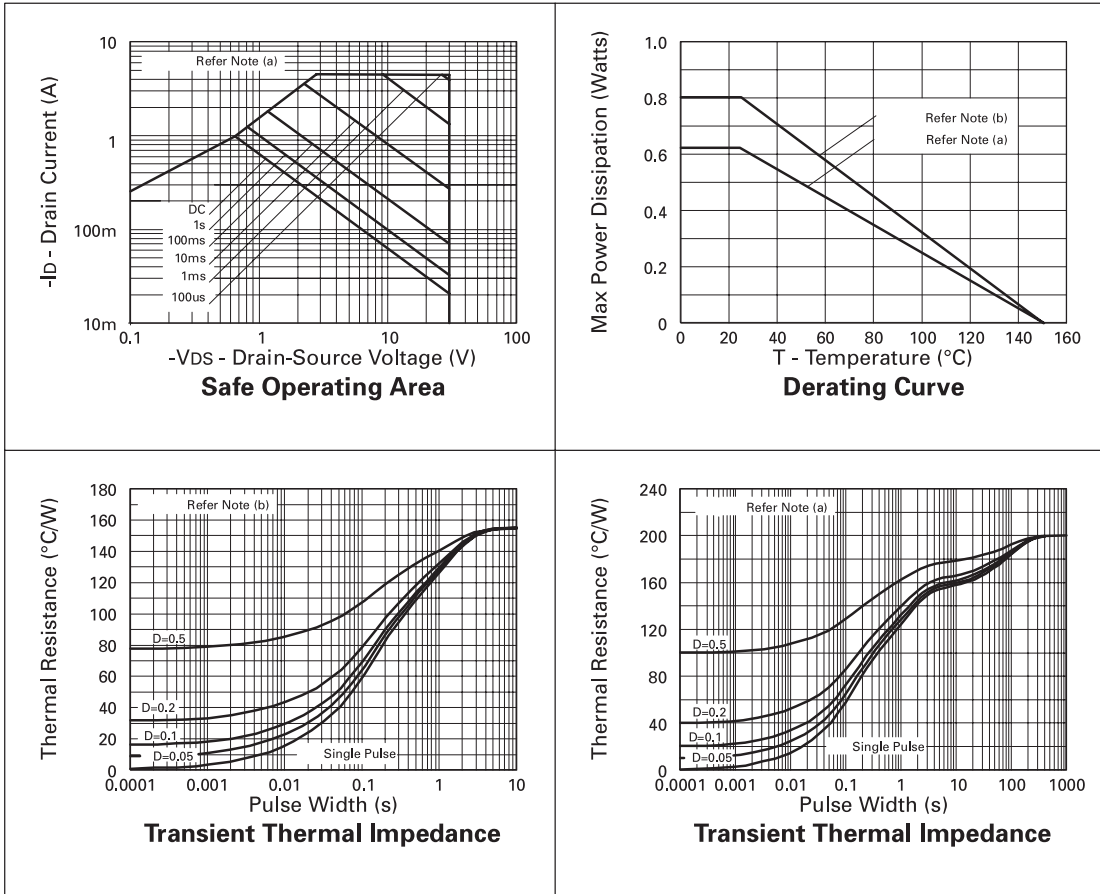
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(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.

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## CHARACTERISTICS



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

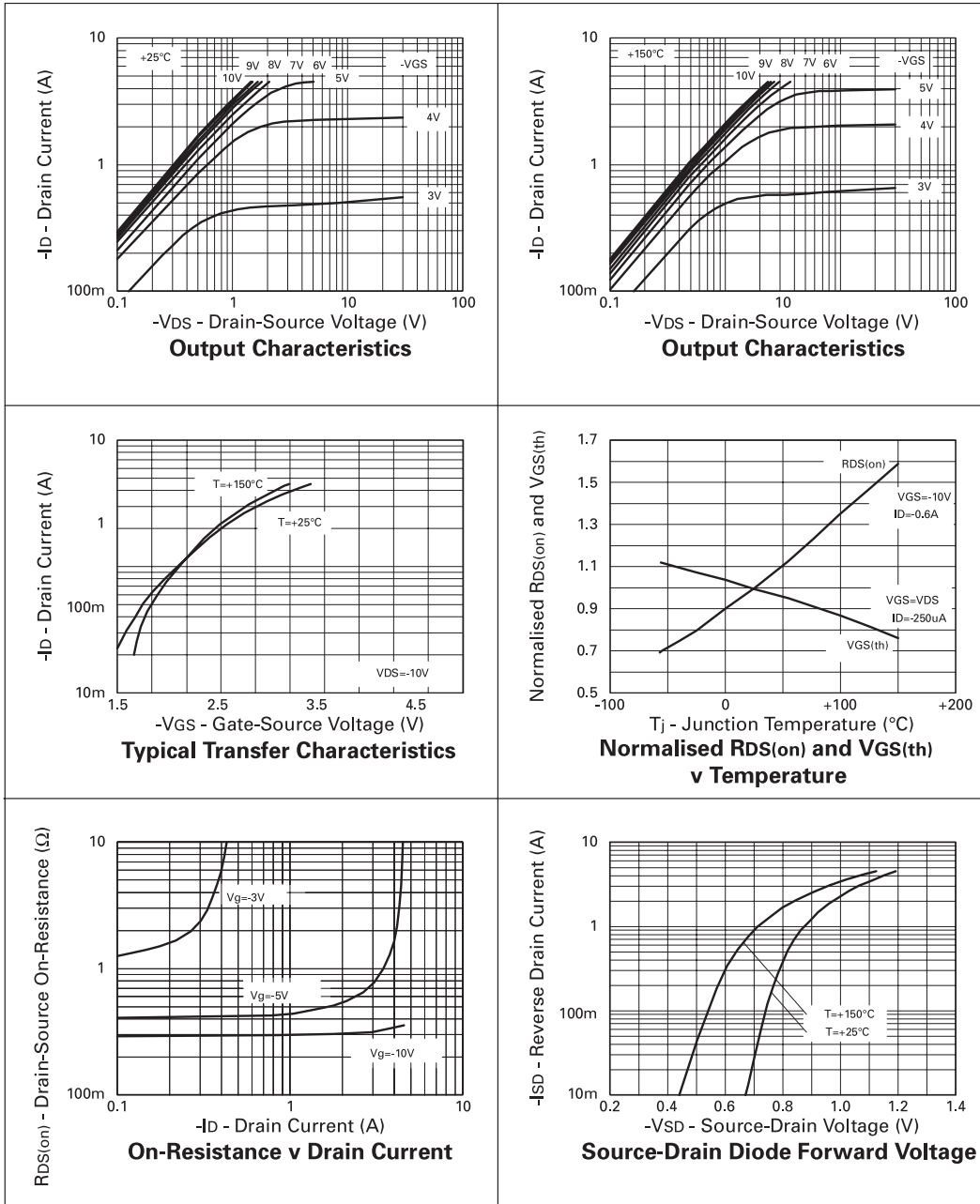
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			-1	$\mu\text{A}$	$V_{DS} = -30\text{V}$ , $V_{GS} = 0\text{V}$
Gate-Body Leakage	$I_{GSS}$			$\pm 100$	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)	$R_{DS(on)}$			0.35 0.55	$\Omega$ $\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -0.6\text{A}$ $V_{GS} = -4.5\text{V}$ , $I_D = -0.3\text{A}$
Forward Transconductance (3)	$g_{fs}$	0.44			S	$V_{DS} = -10\text{V}$ , $I_D = -0.3\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		140		pF	$V_{DS} = -25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$		45		pF	
Reverse Transfer Capacitance	$C_{rss}$		20		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		1.9		ns	$V_{DD} = -15\text{V}$ , $I_D = -0.6\text{A}$ $R_G = 6.2\Omega$ , $R_D = 25\Omega$ (Refer to test circuit)
Rise Time	$t_r$		2.9		ns	
Turn-Off Delay Time	$t_{d(off)}$		8.9		ns	
Fall Time	$t_f$		5.0		ns	
Total Gate Charge	$Q_g$			4.8	nC	$V_{DS} = -24\text{V}$ , $V_{GS} = -10\text{V}$ , $I_D = -0.6\text{A}$ (Refer to test circuit)
Gate-Source Charge	$Q_{gs}$			0.62	nC	
Gate Drain Charge	$Q_{gd}$			1.3	nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			-0.95	V	$T_j = 25^{\circ}\text{C}$ , $I_S = -0.6\text{A}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		14.8		ns	$T_j = 25^{\circ}\text{C}$ , $I_F = -0.6\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge(3)	$Q_{rr}$		7.7		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.

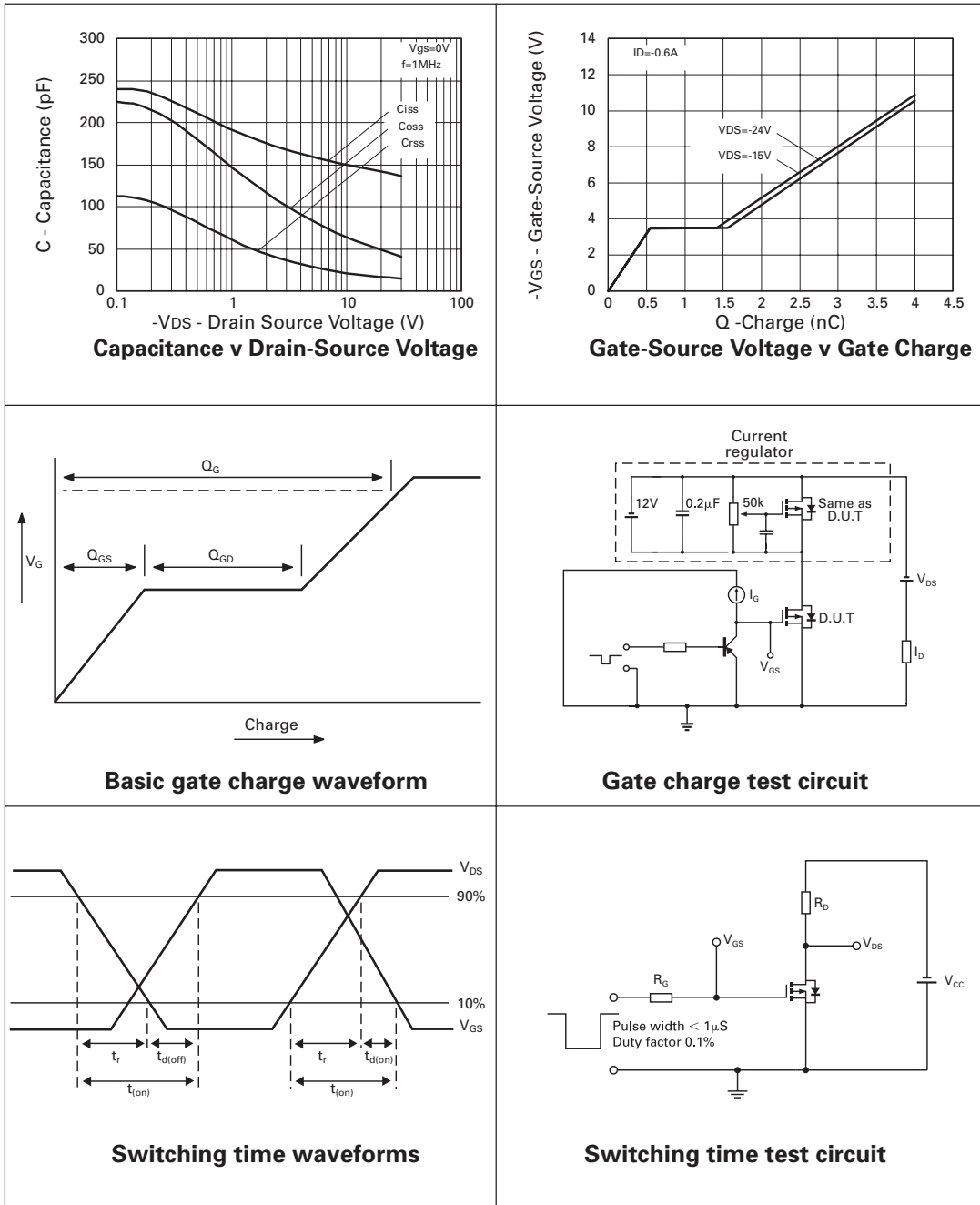
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## TYPICAL CHARACTERISTICS



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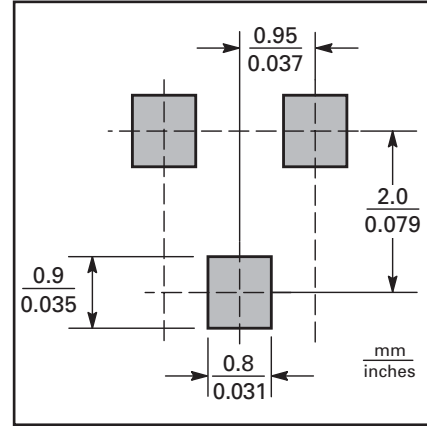
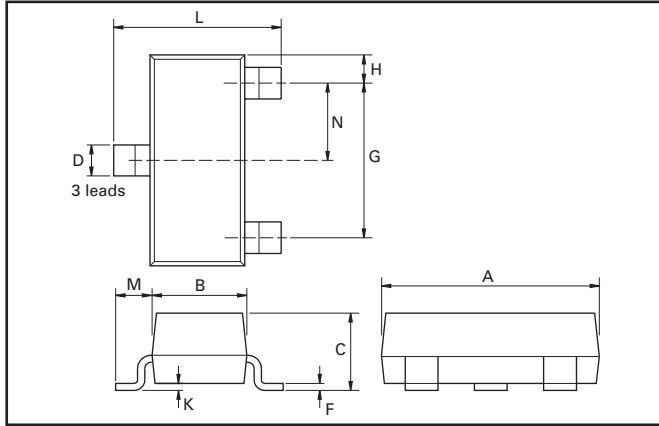
## TYPICAL CHARACTERISTICS



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## PACKAGE DETAILS

## PAD LAYOUT DETAILS



## PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Max	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		—	—		—	

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