

ZXM61P03F

30V P-CHANNEL ENHANCEMENT MODE MOSFET

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

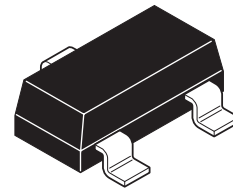
- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

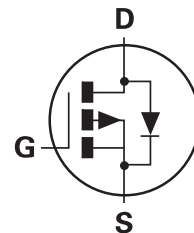
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61P03FTA	7	8 embossed	3,000
ZXM61P03FTC	13	8 embossed	10,000

DEVICE MARKING

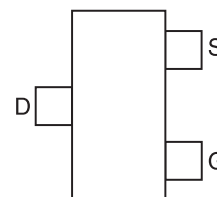
P03



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}	± 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:

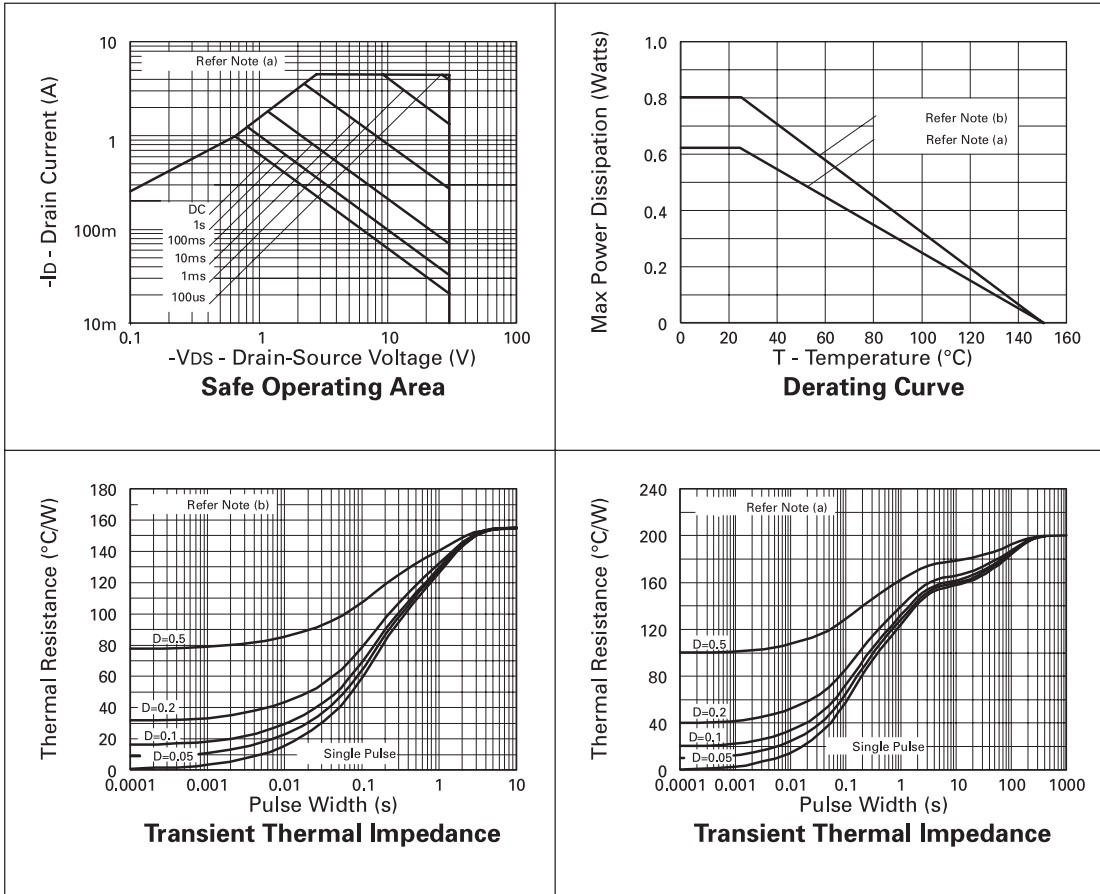
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(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).

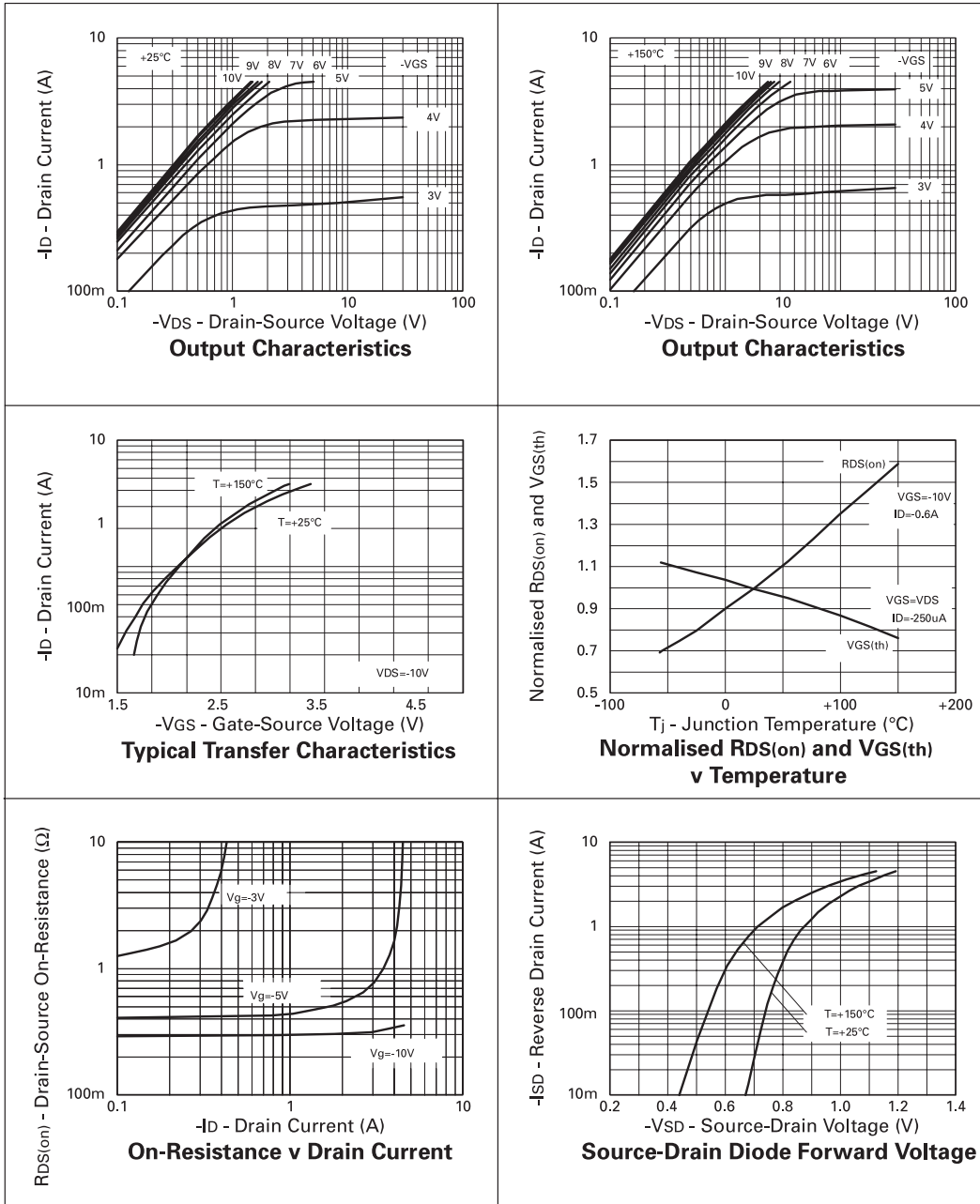
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-1	μA	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}			± 100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
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)	$R_{DS(on)}$			0.35 0.55	Ω Ω	$V_{GS} = -10\text{V}$, $I_D = -0.6\text{A}$ $V_{GS} = -4.5\text{V}$, $I_D = -0.3\text{A}$
Forward Transconductance (3)	g_{fs}	0.44			S	$V_{DS} = -10\text{V}$, $I_D = -0.3\text{A}$
DYNAMIC (3)						
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	
SWITCHING(2) (3)						
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	
SOURCE-DRAIN DIODE						
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 μs . Duty cycle $\leq 2\%$.
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

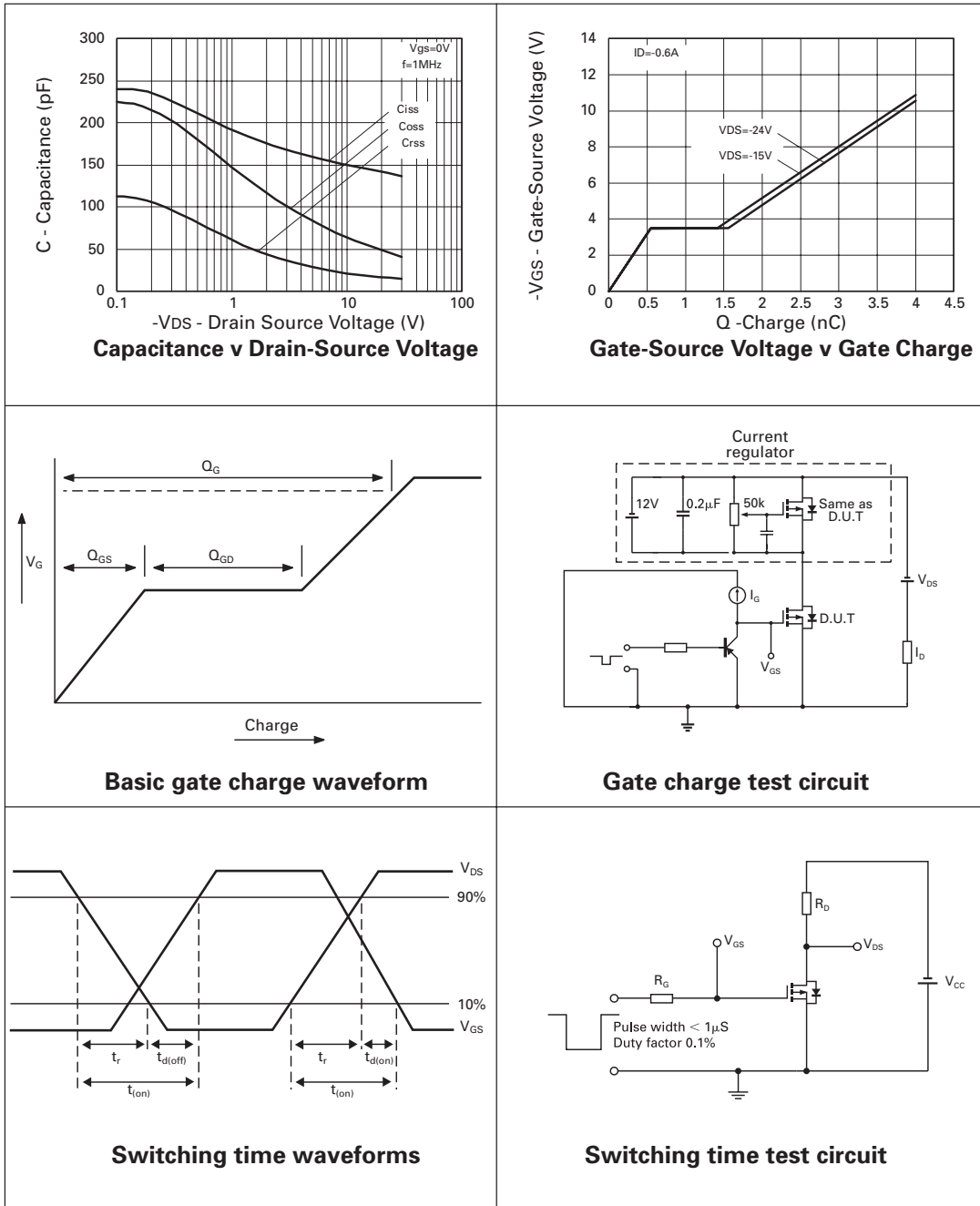
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TYPICAL CHARACTERISTICS



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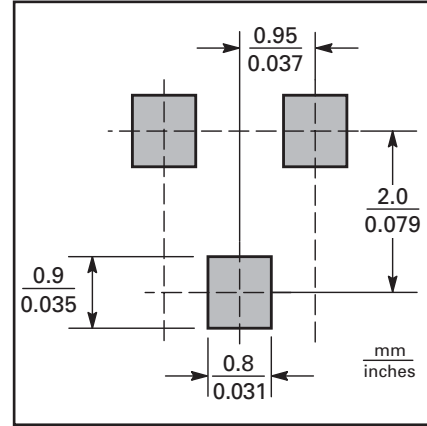
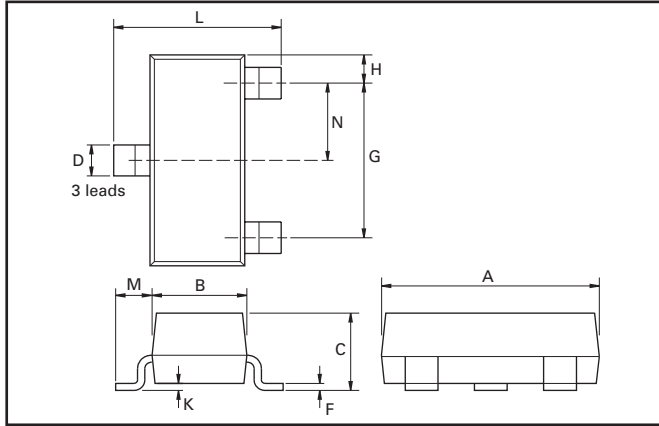
TYPICAL CHARACTERISTICS



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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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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA	Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Zetex Technology Park Chadderton, Oldham, OL9 9LL United Kingdom
Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone: (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru