

30V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -30V$; $R_{DS(ON)} = 0.35\Omega$; $I_D = -1.0A$

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

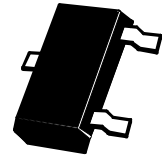
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

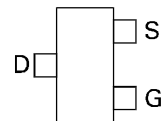
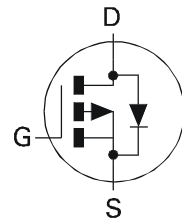
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61P03FTA	7	8mm embossed	3000 units
ZXM61P03FTC	13	8mm embossed	10000 units

DEVICE MARKING

- P03



SOT23



Top View

ZXM61P03F

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	$^\circ C/W$

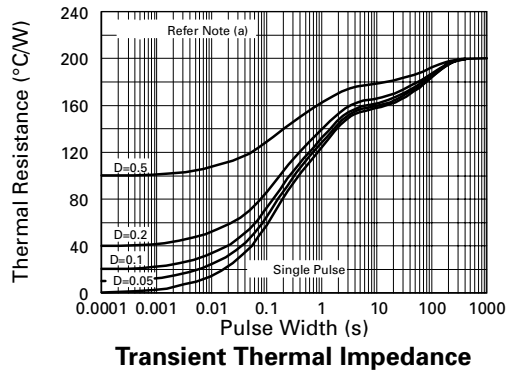
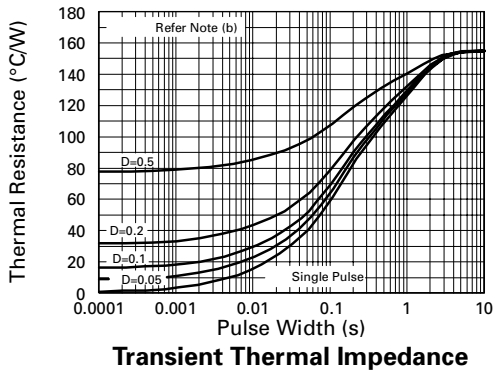
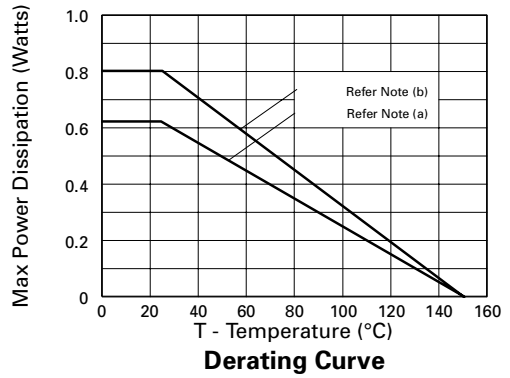
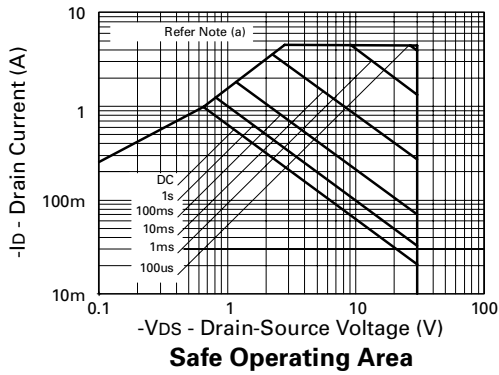
NOTES

(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.

CHARACTERISTICS



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

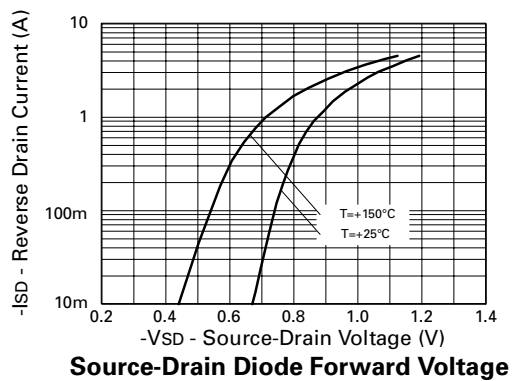
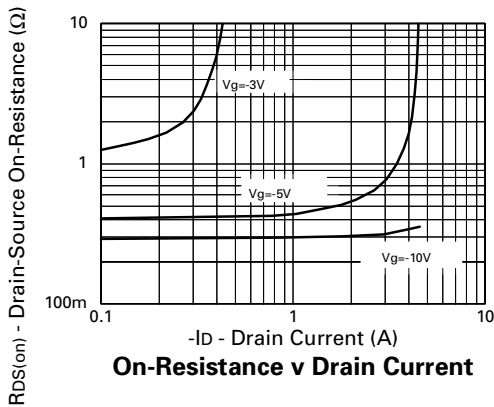
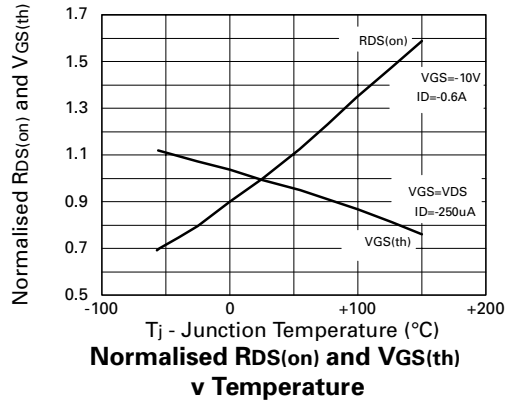
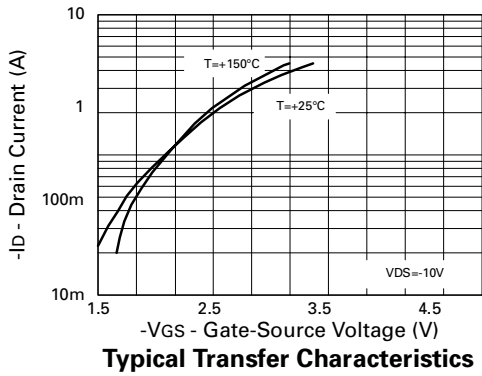
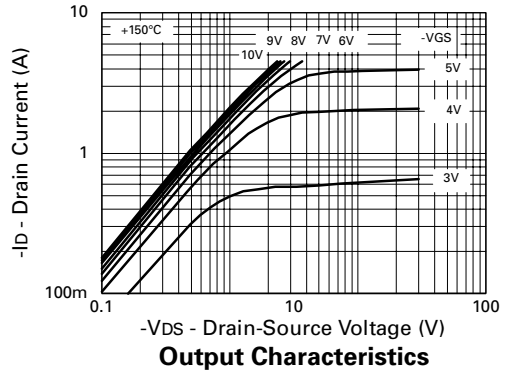
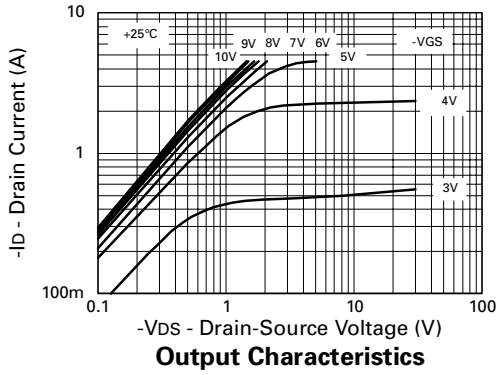
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-1	μA	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}			± 100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
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	

(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.

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

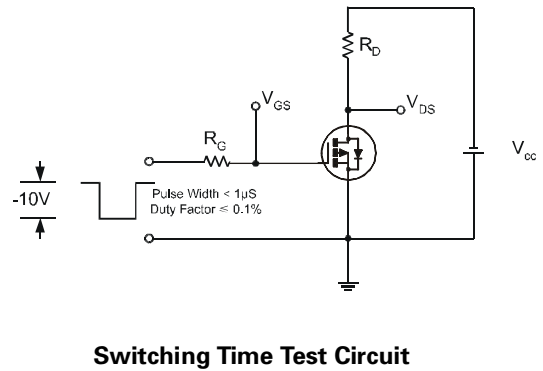
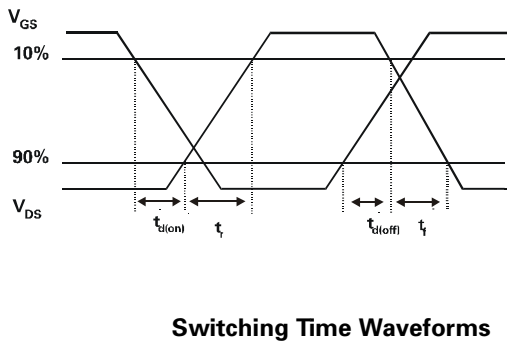
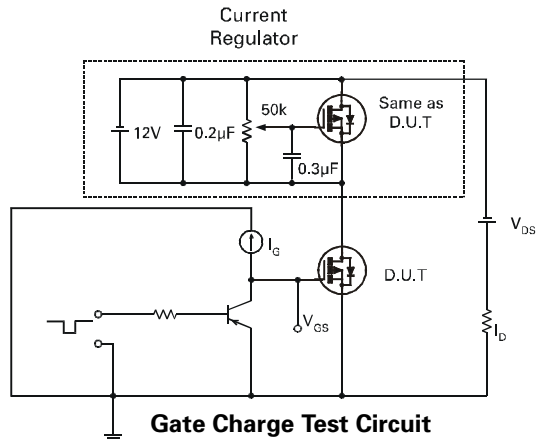
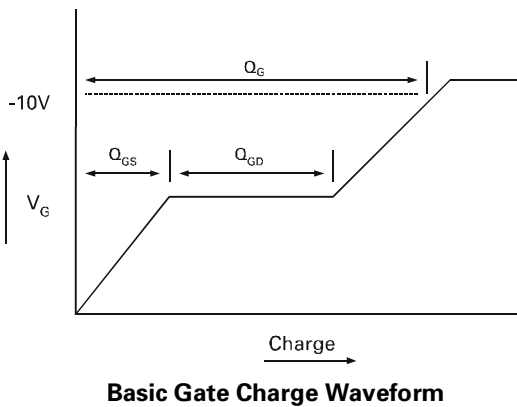
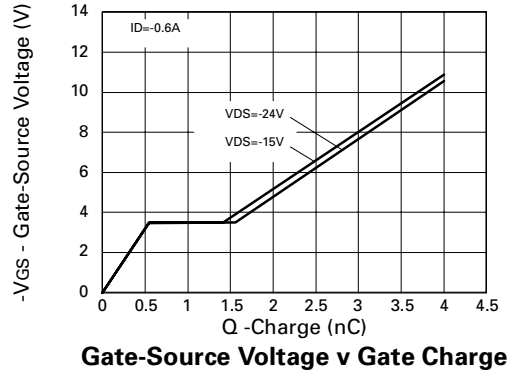
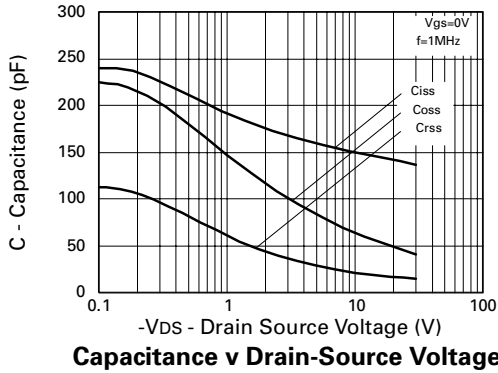
(3) For design aid only, not subject to production testing.

TYPICAL CHARACTERISTICS



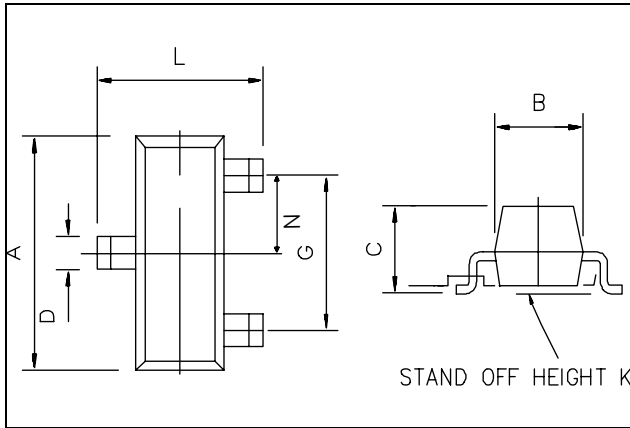
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TYPICAL CHARACTERISTICS



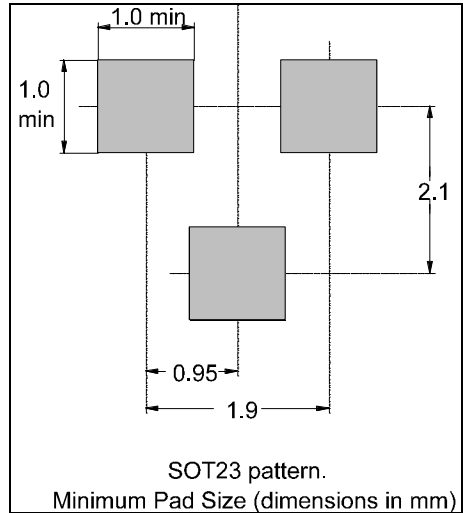
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PACKAGE DIMENSIONS



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



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