

ZXM64P03X

30V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -30V$; $R_{DS(ON)} = 0.075\Omega$; $I_D = -3.8A$

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
- Low profile SOIC package

APPLICATIONS

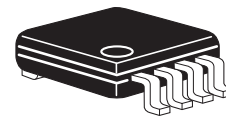
- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

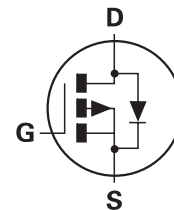
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM64P03XTA	7	12 embossed	1,000
ZXM64P03XTC	13	12 embossed	4,000

DEVICE MARKING

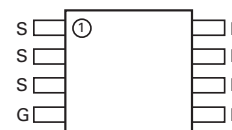
ZXM4P03



MSOP8



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 ($V_{GS}=4.5V$; $T_A=25^\circ C$)(b) ($V_{GS}=4.5V$; $T_A=70^\circ C$)(b)	I_D	-3.8 -3.0	A
Pulsed Drain Current (c)	I_{DM}	-19	A
Continuous Source Current (Body Diode)(b)	I_S	-2.3	A
Pulsed Source Current (Body Diode)(c)	I_{SM}	-19	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	P_D	1.1 8.8	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	P_D	1.8 14.4	W mW/ $^\circ C$
Operating and Storage Temperature Range	T_j ; T_{stg}	-55 to +150	$^\circ C$

THERMAL RESISTANCE

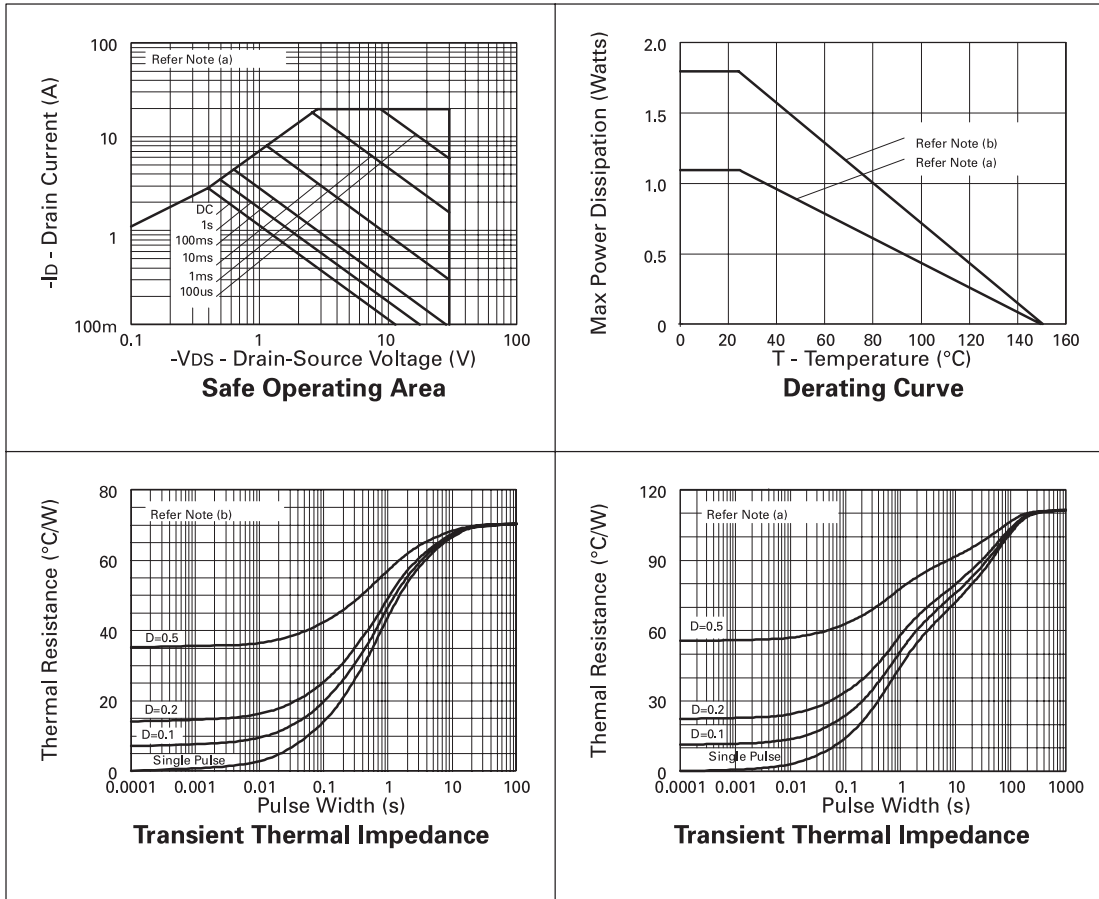
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	70	$^\circ C/W$

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 $t \leq 10$ 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)

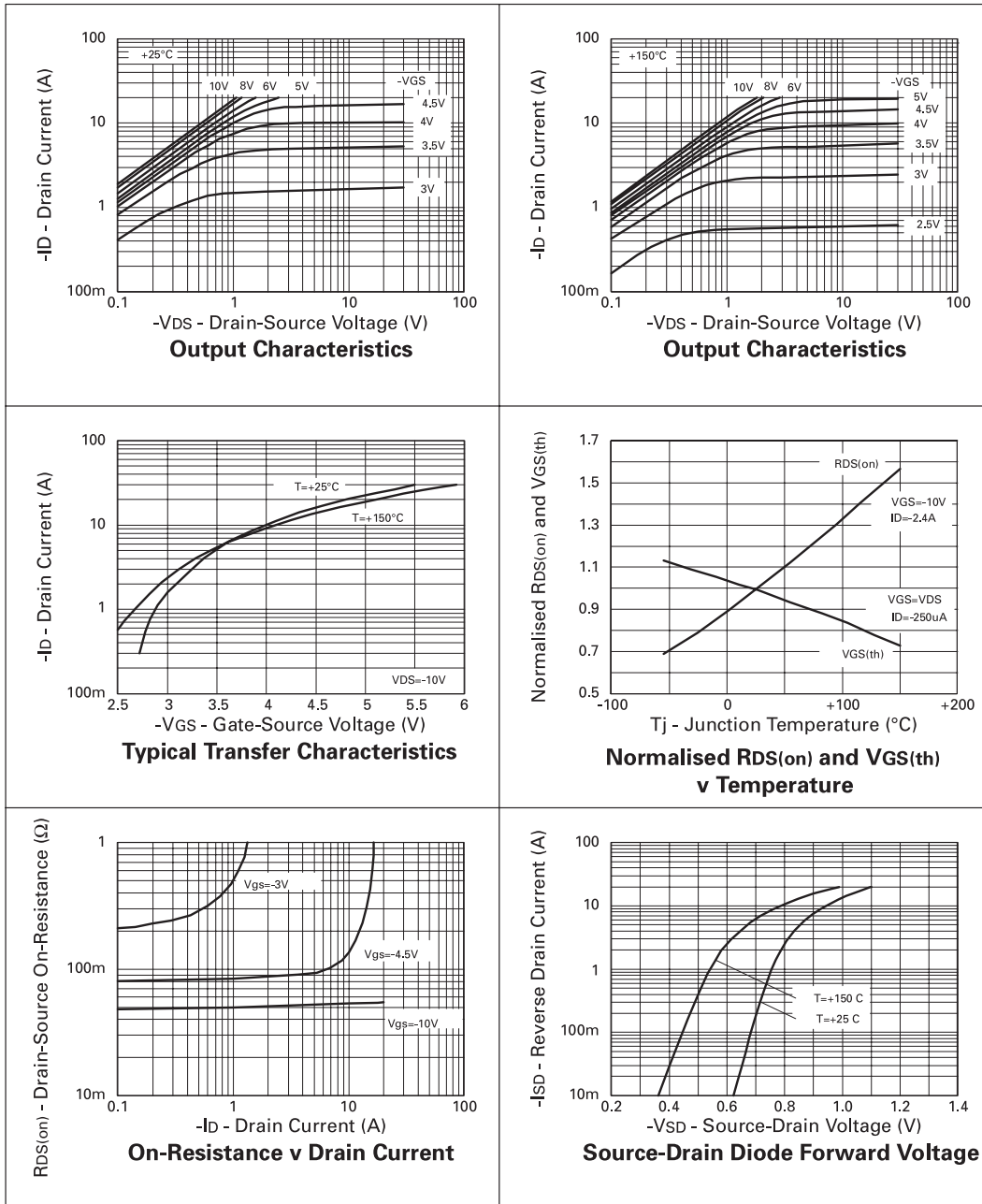
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-1	μA	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}			± 100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
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)	$R_{DS(on)}$			0.075 0.100	Ω Ω	$V_{GS} = -10\text{V}$, $I_D = -2.4\text{A}$ $V_{GS} = -4.5\text{V}$, $I_D = -1.2\text{A}$
Forward Transconductance (3)	g_{fs}	2.3			S	$V_{DS} = -10\text{V}$, $I_D = -1.2\text{A}$
DYNAMIC (3)						
Input Capacitance	C_{iss}		825		pF	$V_{DS} = -25\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{oss}		250		pF	
Reverse Transfer Capacitance	C_{rss}		80		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		4.4		ns	$V_{DD} = -15\text{V}$, $I_D = -2.4\text{A}$ $R_G = 6.2\Omega$, $R_D = 6.2\Omega$ (Refer to test circuit)
Rise Time	t_r		6.2		ns	
Turn-Off Delay Time	$t_{d(off)}$		40		ns	
Fall Time	t_f		29.2		ns	
Total Gate Charge	Q_g			46	nC	$V_{DS} = -24\text{V}$, $V_{GS} = -10\text{V}$, $I_D = -2.4\text{A}$ (Refer to test circuit)
Gate-Source Charge	Q_{gs}			9	nC	
Gate Drain Charge	Q_{gd}			11.5	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			-0.95	V	$T_j = 25^{\circ}\text{C}$, $I_S = -2.4\text{A}$, $V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	t_{rr}		30.2		ns	$T_j = 25^{\circ}\text{C}$, $I_F = -2.4\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge(3)	Q_{rr}		27.8		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.

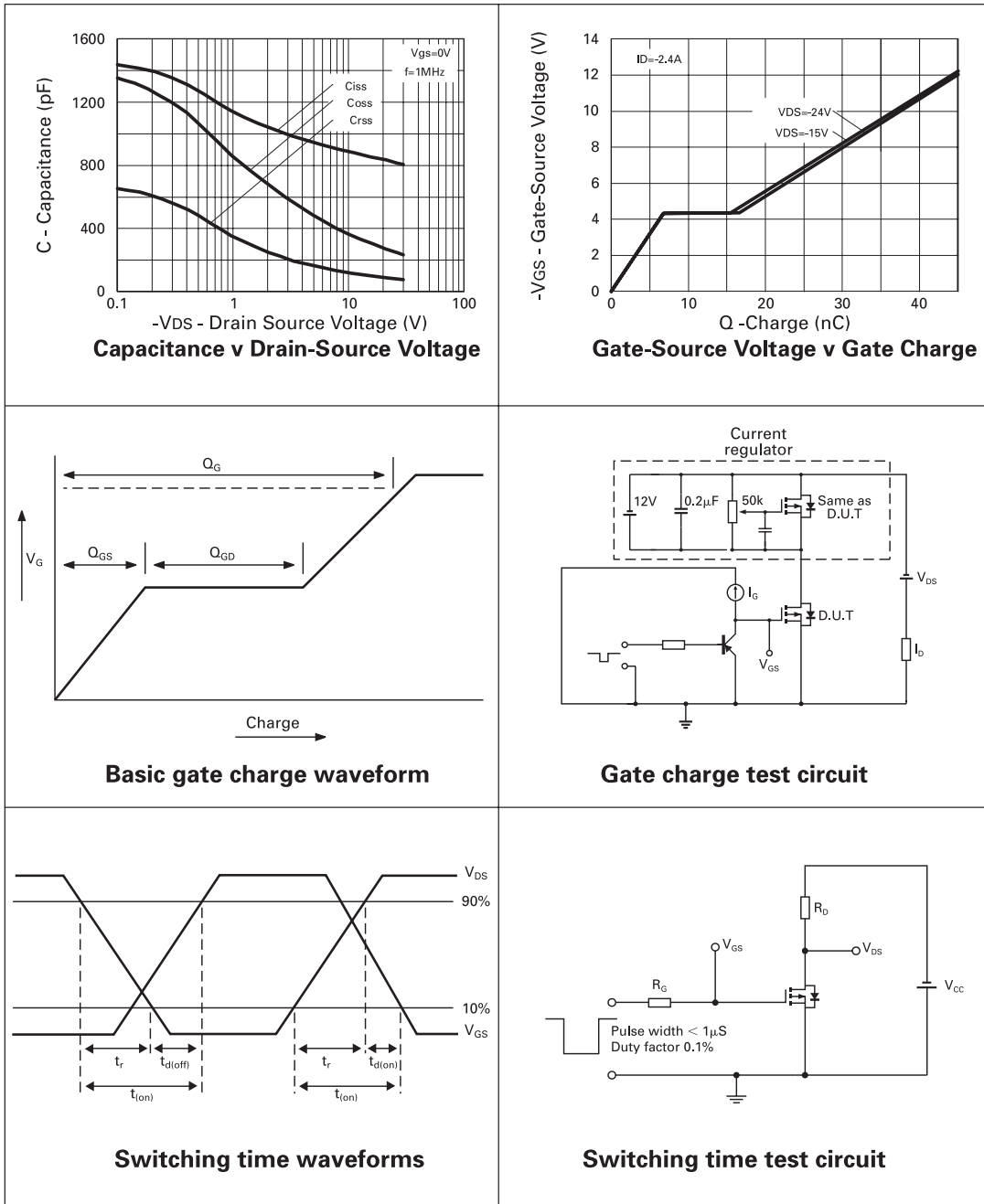
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TYPICAL CHARACTERISTICS



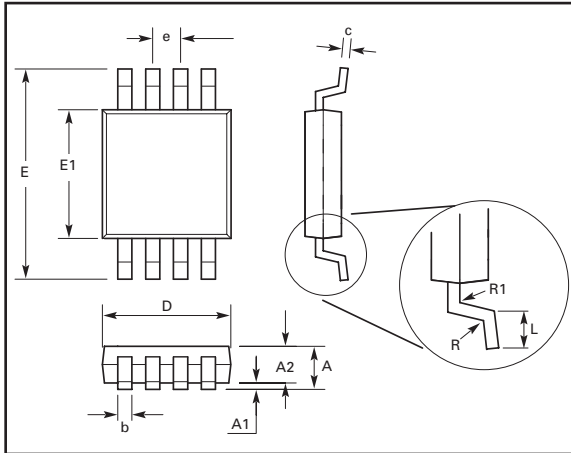
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TYPICAL CHARACTERISTICS

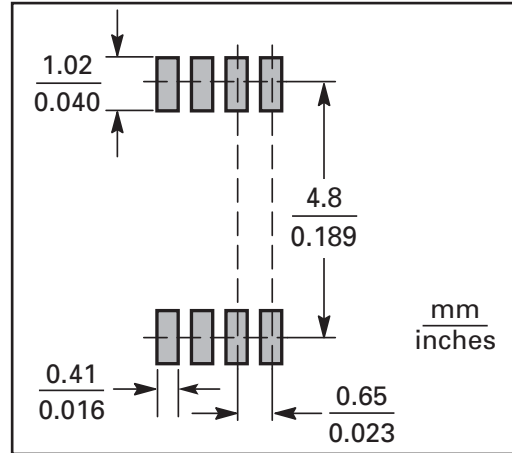


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PACKAGE DETAILS



PAD LAYOUT DETAILS



PACKAGE DIMENSIONS

DIM	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.91	1.11	0.036	0.044
A1	0.10	0.20	0.004	0.008
B	0.25	0.36	0.010	0.014
C	0.13	0.18	0.005	0.007
D	2.95	3.05	0.116	0.120
e	0.65NOM		0.0256	
e1	0.33NOM		0.0128	
E	2.95	3.05	0.116	0.120
H	4.78	5.03	0.188	0.198
L	0.41	0.66	0.016	0.026
θ°	0°	6°	0°	6°

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