

# ZXM64P03X

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## 30V P-CHANNEL ENHANCEMENT MODE MOSFET

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### 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

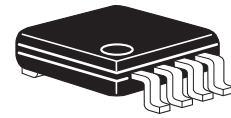
- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control

### ORDERING INFORMATION

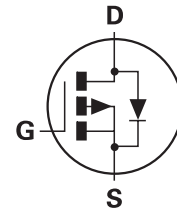
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM64P03XTA	7	12 embossed	1,000
ZXM64P03XTC	13	12 embossed	4,000

### DEVICE MARKING

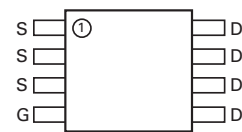
ZXM4P03



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	$V_{GS}$	$\pm 20$	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

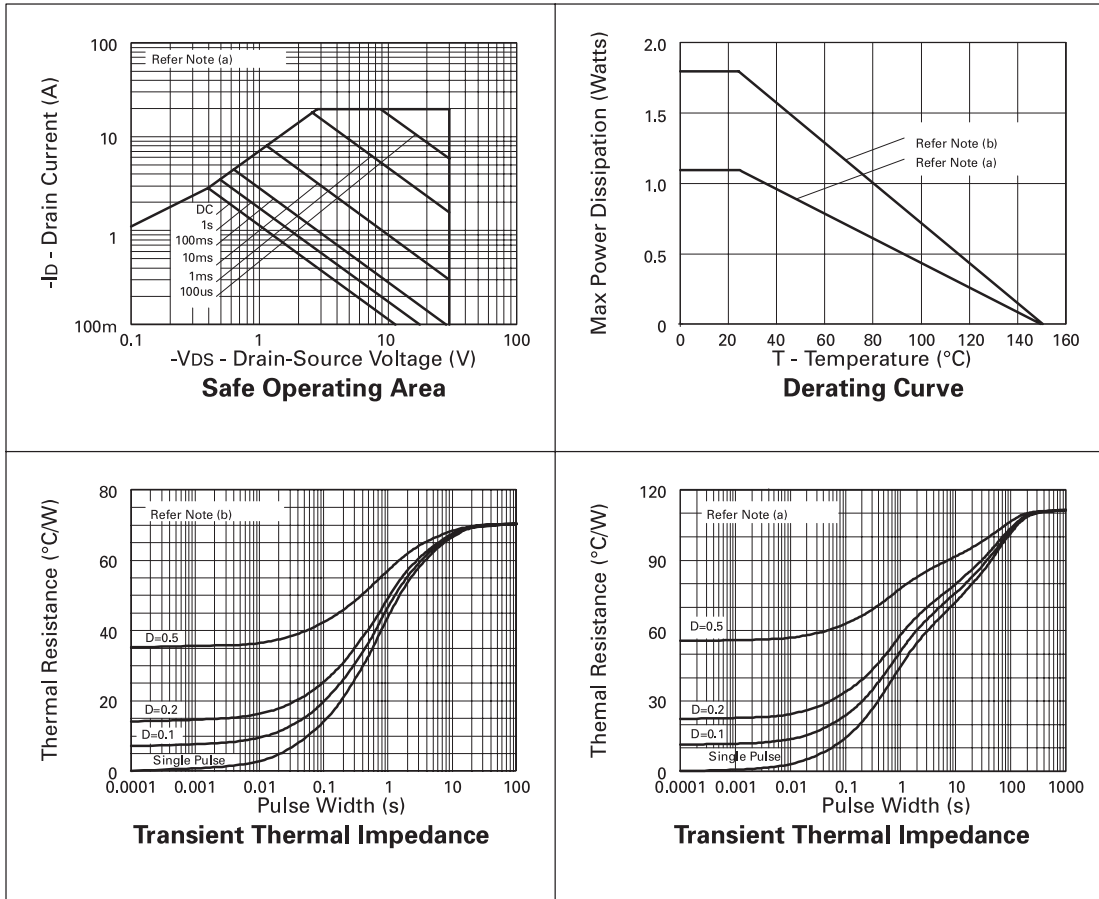
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	70	$^\circ C/W$

### 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)

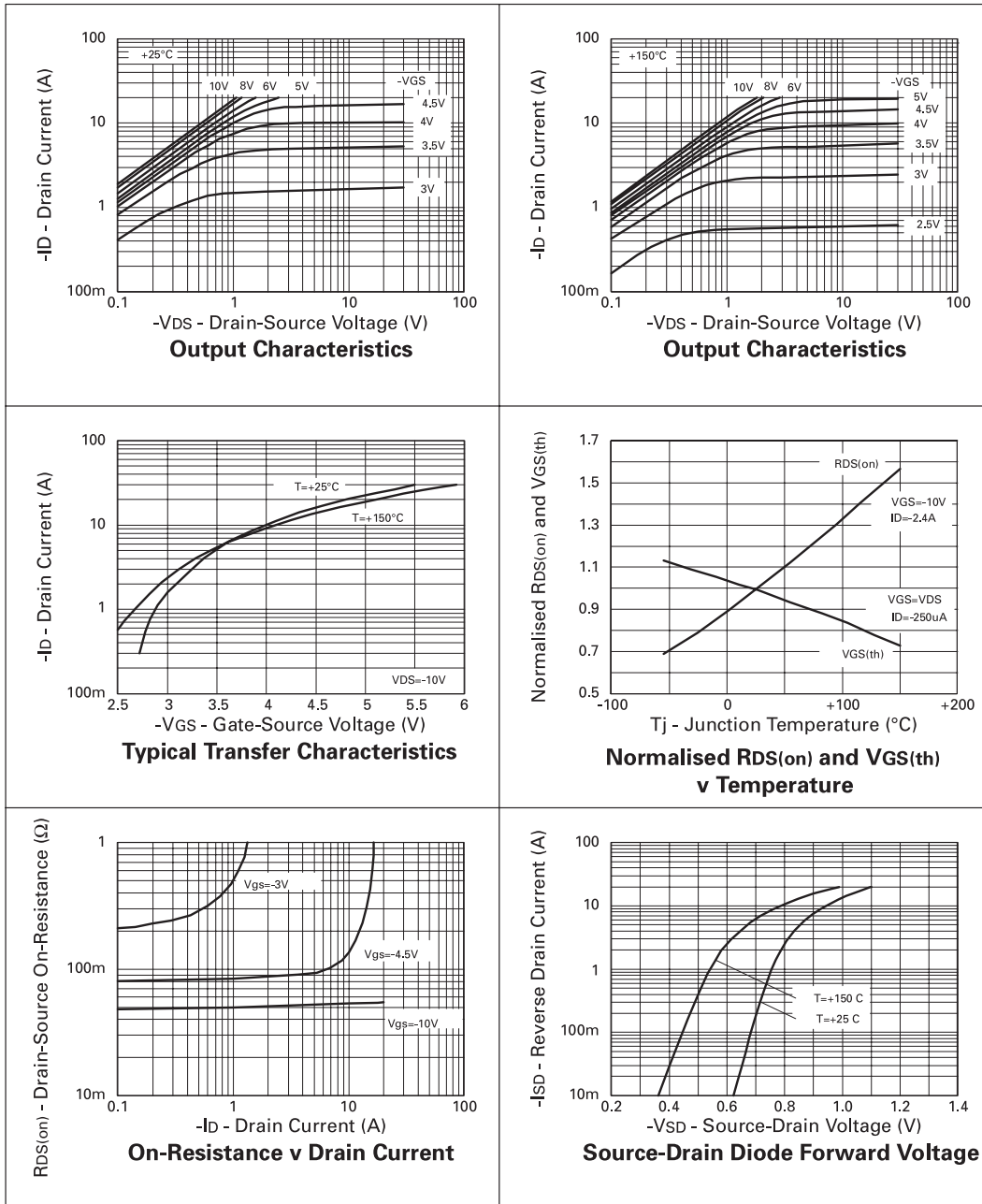
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30			V	$I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			-1	$\mu\text{A}$	$V_{DS} = -30\text{V}$ , $V_{GS} = 0\text{V}$
Gate-Body Leakage	$I_{GSS}$			$\pm 100$	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)	$R_{DS(on)}$			0.075 0.100	$\Omega$ $\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -2.4\text{A}$ $V_{GS} = -4.5\text{V}$ , $I_D = -1.2\text{A}$
Forward Transconductance (3)	$g_{fs}$	2.3			S	$V_{DS} = -10\text{V}$ , $I_D = -1.2\text{A}$
<b>DYNAMIC (3)</b>						
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	
<b>SWITCHING(2) (3)</b>						
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	
Gate-Source Charge	$Q_{gs}$			9	nC	$V_{DS} = -24\text{V}$ , $V_{GS} = -10\text{V}$ , $I_D = -2.4\text{A}$ (Refer to test circuit)
Gate Drain Charge	$Q_{gd}$			11.5	nC	
<b>SOURCE-DRAIN DIODE</b>						
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 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

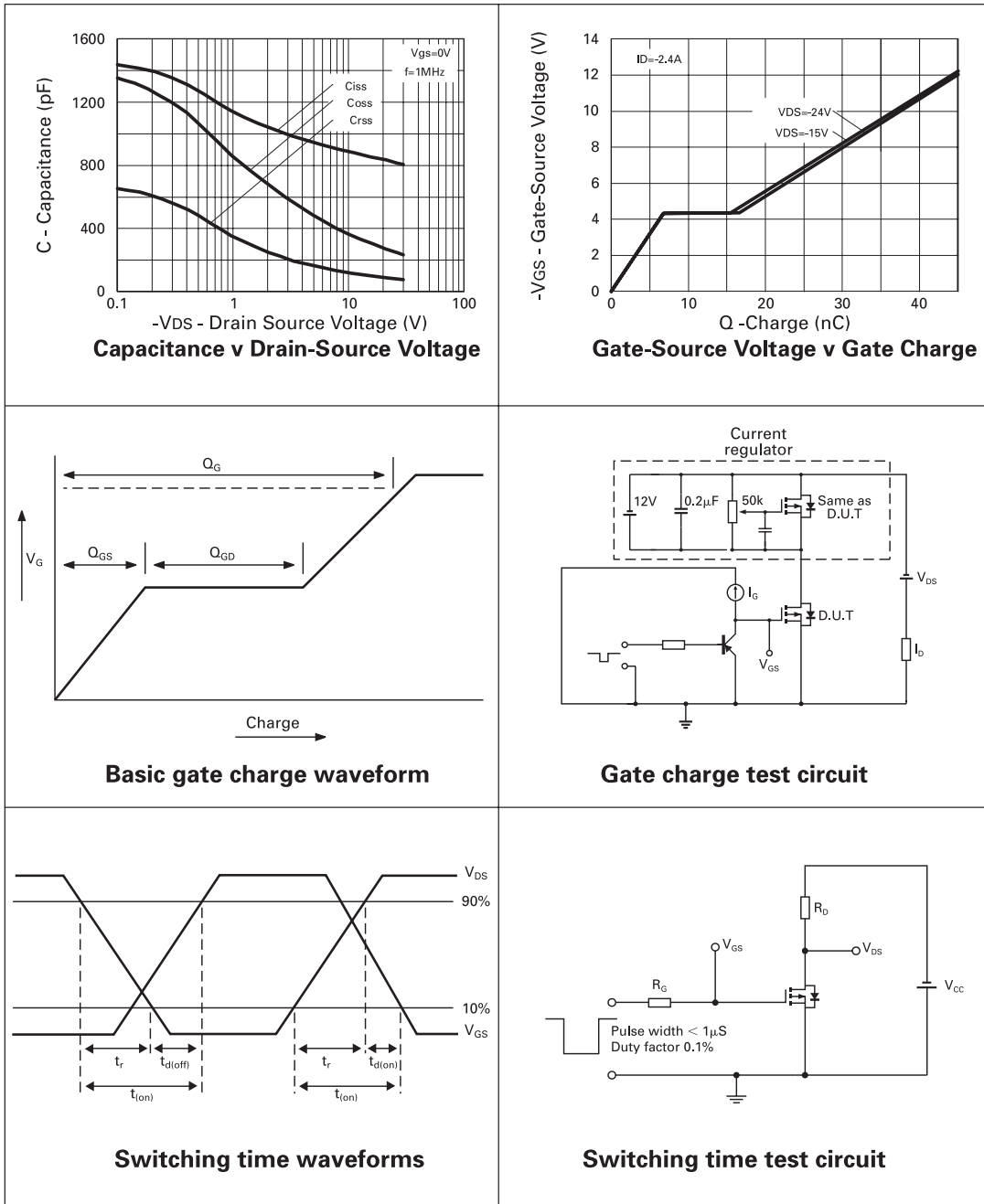
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## TYPICAL CHARACTERISTICS



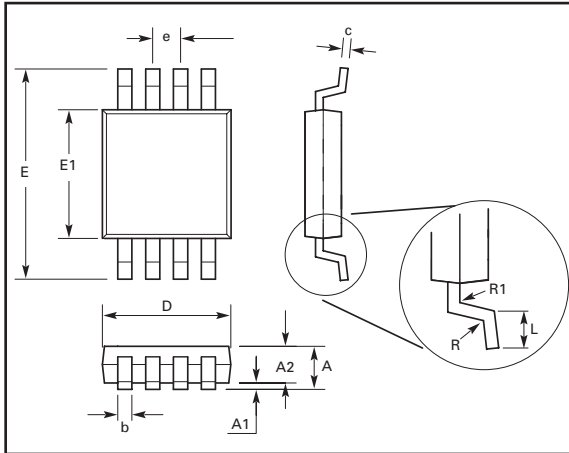
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## TYPICAL CHARACTERISTICS

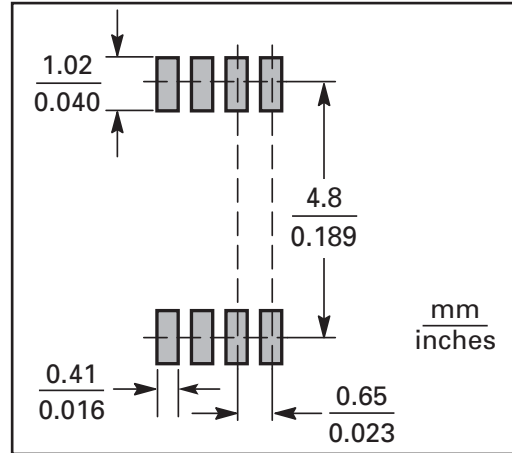


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## PACKAGE DETAILS



## PAD LAYOUT DETAILS



## PACKAGE DIMENSIONS

DIM	Millimeters		Inches	
	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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