

# ZXM64N03X

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## 30V N-CANNEL ENHANCEMENT MODE MOSFET

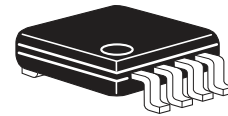
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### SUMMARY

$V_{(BR)DSS}=30V$ ;  $R_{DS(ON)}=0.045\Omega$ ;  $I_D=5.0A$

### 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.



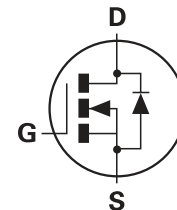
MSOP8

### FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

### APPLICATIONS

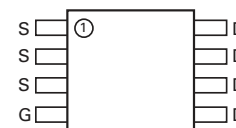
- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control



Pin out

### ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM64N03XTA	7	12 embossed	1,000
ZXM64N03XTC	13	12 embossed	4,000



Top view

### DEVICE MARKING

ZXM4P03

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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)	$I_D$	5.0 4.0	A
Pulsed Drain Current (c)	$I_{DM}$	30	A
Continuous Source Current (Body Diode)(b)	$I_S$	2.4	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	30	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

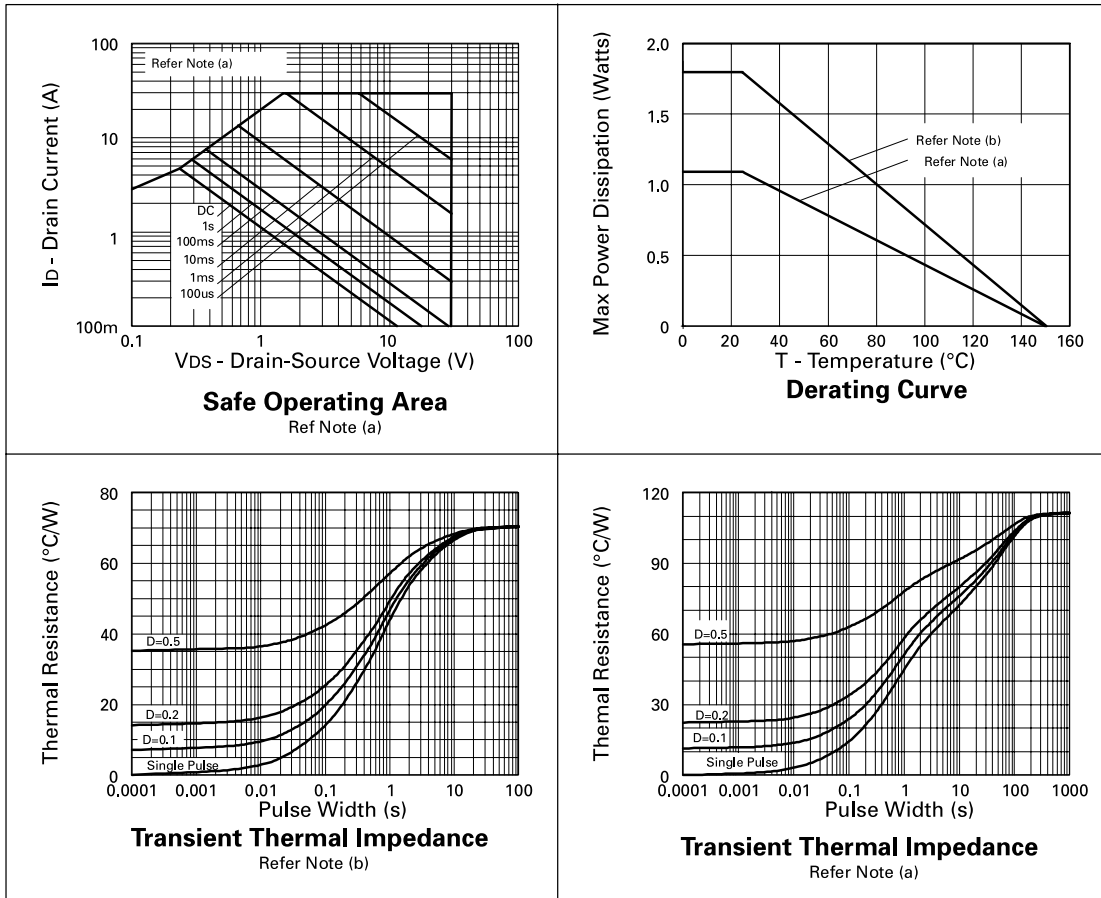
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	113	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	70	$^\circ C/W$

### 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)	$R_{DS(on)}$			0.045 0.060	$\Omega$ $\Omega$	$V_{GS} = 10\text{V}$ , $I_D = 3.7\text{A}$ $V_{GS} = 4.5\text{V}$ , $I_D = 1.9\text{A}$
Forward Transconductance (3)	$g_{fs}$	4.3			S	$V_{DS} = 10\text{V}$ , $I_D = -1.9\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		950		pF	$V_{DS} = 25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$		200		pF	
Reverse Transfer Capacitance	$C_{rss}$		50		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		4.2		ns	$V_{DD} = 5\text{V}$ , $I_D = 3.7\text{A}$ $R_G = 6.2\Omega$ , $R_D = 4.0\Omega$ (Refer to test circuit)
Rise Time	$t_r$		4.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		20.5		ns	
Fall Time	$t_f$		8		ns	
Total Gate Charge	$Q_g$			27	nC	$V_{DS} = 24\text{V}$ , $V_{GS} = 10\text{V}$ , $I_D = 3.7\text{A}$ (Refer to test circuit)
Gate-Source Charge	$Q_{gs}$			5	nC	
Gate Drain Charge	$Q_{gd}$			4.5	nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			0.95	V	$T_j = 25^{\circ}\text{C}$ , $I_S = 3.7\text{A}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		24.5		ns	$T_j = 25^{\circ}\text{C}$ , $I_F = 3.7\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge(3)	$Q_{rr}$		19.1		nC	

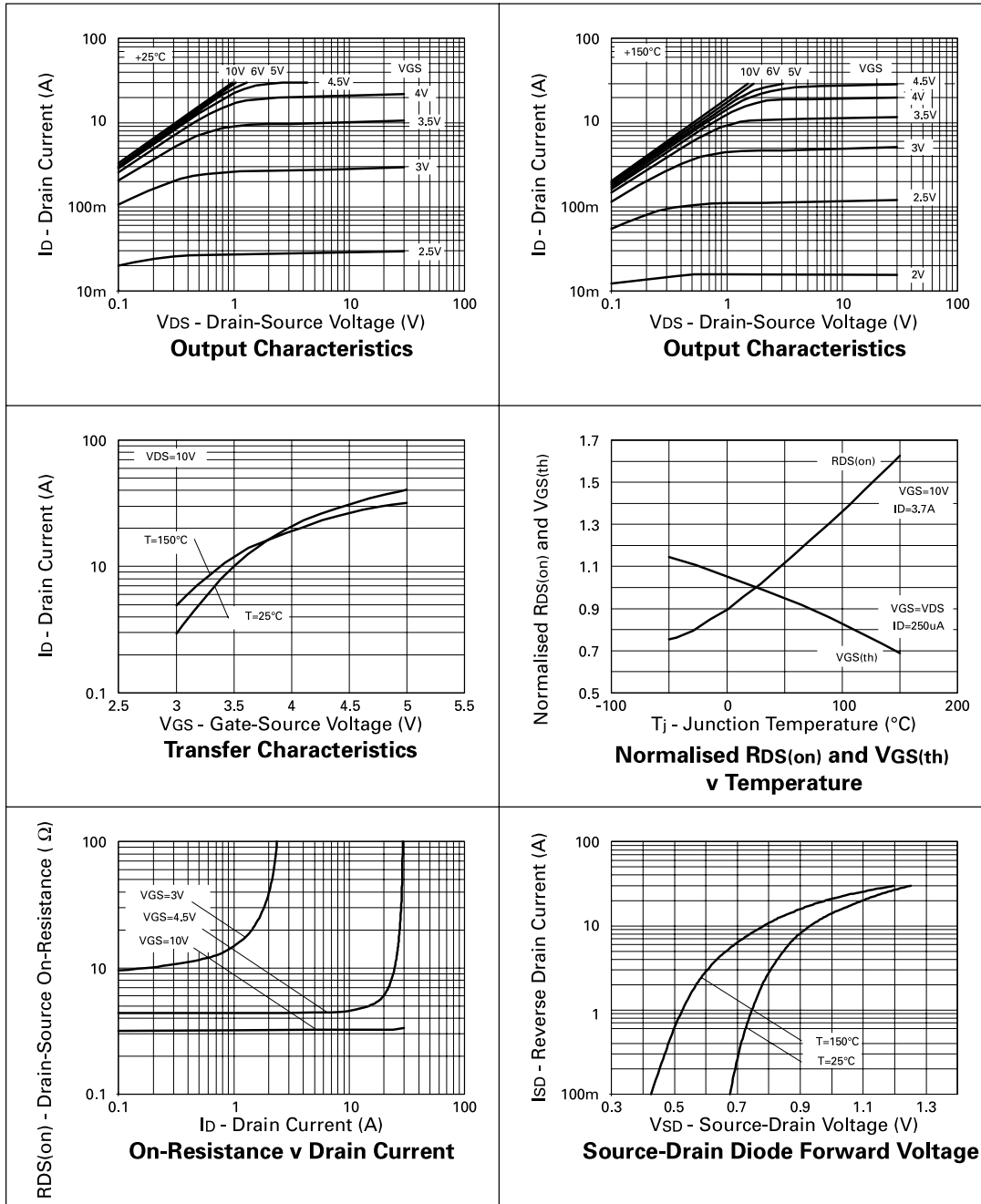
(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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

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

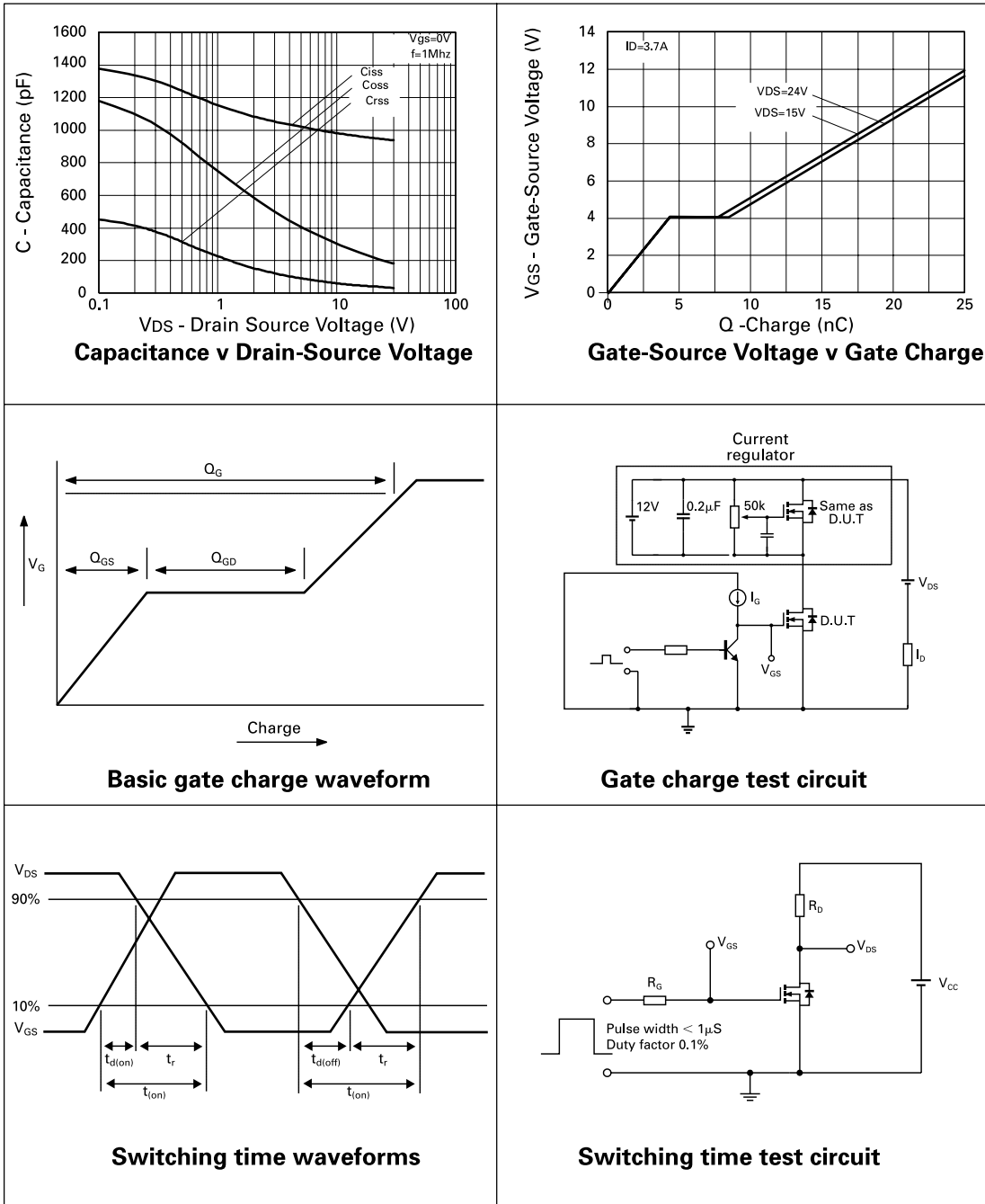
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## TYPICAL CHARACTERISTICS



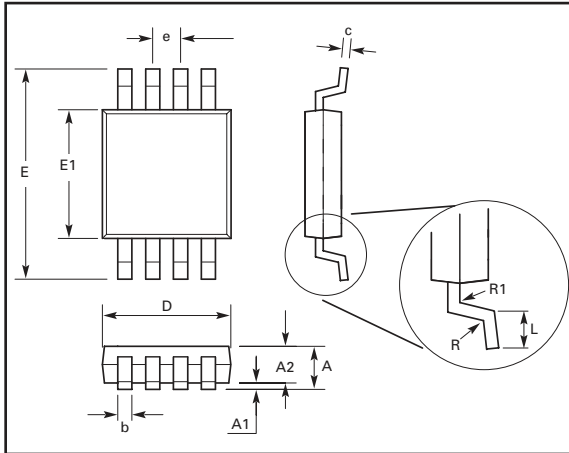
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## TYPICAL CHARACTERISTICS

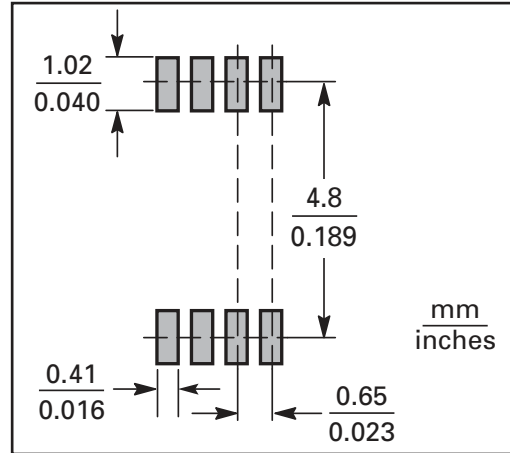


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## PACKAGE DETAILS



## 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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ISSUE 1 - OCTOBER 2005