

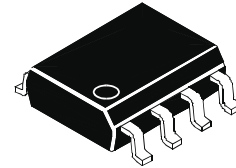
## DUAL 30V P-CANNEL ENHANCEMENT MODE MOSFET

### SUMMARY

**$V_{(BR)DSS}=-30V$ ;  $R_{DS(ON)}=0.055\Omega$ ;  $I_D=-4.8A$**

### 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.



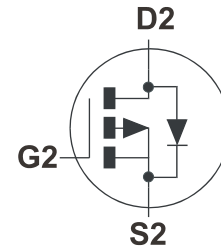
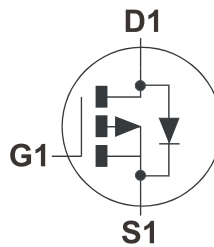
SO8

### FEATURES

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

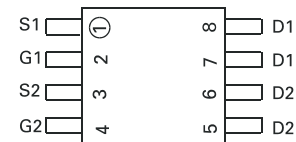
### APPLICATIONS

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



### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMD65P03N8TA	7"	12mm	500 units
ZXMD65P03N8TC	13"	12mm	2500 units



Top View

### DEVICE MARKING

- ZXMD  
65P03

# ZXMD65P03N8

## 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 $V_{GS}=-10V$ ; $T_A=25^\circ C$ (b)(d) $V_{GS}=-10V$ ; $T_A=70^\circ C$ (b)(d) $V_{GS}=-10V$ ; $T_A=25^\circ C$ (a)(d)	$I_D$	-4.8 -3.8 -3.8	A
Pulsed Drain Current (c)(d)	$I_{DM}$	-18	A
Continuous Source Current (Body Diode)(b)(d)	$I_S$	-3.0	A
Pulsed Source Current (Body Diode)(c)(d)	$I_{SM}$	-18	A
Power Dissipation at $T_A=25^\circ C$ (a)(d) Linear Derating Factor	$P_D$	1.25 10	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (a)(e) Linear Derating Factor	$P_D$	1.75 14	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b)(d) Linear Derating Factor	$P_D$	2.0 16	W mW/ $^\circ C$

## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)(d)	$R_{\theta JA}$	100	$^\circ C/W$
Junction to Ambient (a)(e)	$R_{\theta JA}$	71.4	$^\circ C/W$
Junction to Ambient (b)(d)	$R_{\theta JA}$	62.5	$^\circ C/W$

### 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 25mm x 25mm FR4 PCB,  $D = 0.05$ , pulse width 10 $\mu s$  - pulse width limited by maximum junction temperature.
- (d) For device with one active die.
- (e) For device with two active die running at equal power.



# ZXMD65P03N8

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNI T	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	$\mu\text{A}$	$V_{DS} = -24\text{V}$ , $V_{GS} = 0\text{V}$
Gate-Body Leakage	$I_{GSS}$			-100	nA	$V_{GS} = \pm 12\text{V}$ , $V_{DS} = 0\text{V}$
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)	$R_{DS(on)}$			0.055 0.080	$\Omega$ $\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -4.9\text{A}$ $V_{GS} = -4.5\text{V}$ , $I_D = -3.6\text{A}$
Forward Transconductance (1)(3)	$g_{fs}$		8.8		S	$V_{DS} = -15\text{V}$ , $I_D = -4.9\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		930		pF	$V_{DS} = -25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$		311		pF	
Reverse Transfer Capacitance	$C_{rss}$		113		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		3.8		ns	$V_{DD} = -15\text{V}$ , $I_D = -4.9\text{A}$ $R_G = 6.0\Omega$ , $V_{GS} = -10\text{V}$
Rise Time	$t_r$		6.4		ns	
Turn-Off Delay Time	$t_{d(off)}$		49.5		ns	
Fall Time	$t_f$		26.2		ns	
Gate Charge	$Q_g$		13		nC	$V_{DS} = -15\text{V}$ , $V_{GS} = -5\text{V}$ $I_D = -4.9\text{A}$
Total Gate Charge	$Q_g$		25.7		nC	$V_{DS} = -15\text{V}$ , $V_{GS} = -10\text{V}$ $I_D = -4.9\text{A}$
Gate-Source Charge	$Q_{gs}$		3.2		nC	
Gate Drain Charge	$Q_{gd}$		7.0		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$			0.95	V	$T_J = 25^{\circ}\text{C}$ , $I_S = -4.9\text{A}$ , $V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		31.5		ns	$T_J = 25^{\circ}\text{C}$ , $I_F = -4.9\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge(3)	$Q_{rr}$		63.9		nC	

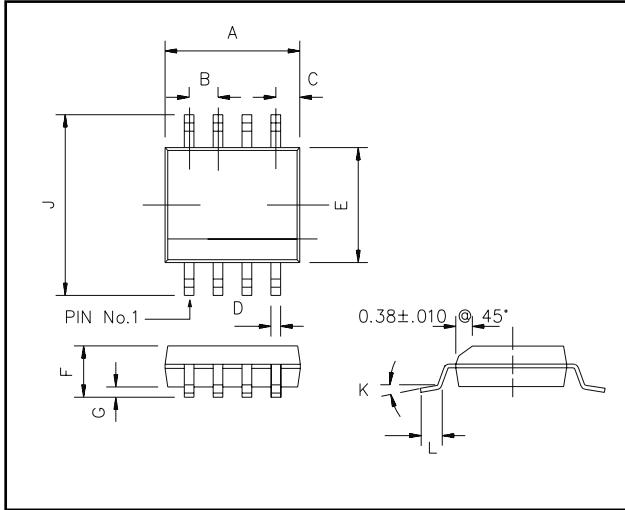
(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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

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

# ZXMD65P03N8

## PACKAGE DIMENSIONS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	4.80	4.98	0.189	0.196
B	1.27 BSC		0.05 BSC	
C	0.53 REF		0.02 REF	
D	0.36	0.46	0.014	0.018
E	3.81	3.99	0.15	0.157
F	1.35	1.75	0.05	0.07
G	0.10	0.25	0.004	0.010
J	5.80	6.20	0.23	0.24
K	0°	8°	0°	8°
L	0.41	1.27	0.016	0.050



Zetex plc.  
Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.  
Telephone: (44)161 622 4422 (Sales), (44)161 622 4444 (General Enquiries)  
Fax: (44)161 622 4420

Zetex GmbH  
Streitfeldstraße 19  
D-81673 München  
Germany  
Telefon: (49) 89 45 49 49 0  
Fax: (49) 89 45 49 49 49

Zetex Inc.  
47 Mall Drive, Unit 4  
Commack NY 11725  
USA  
Telephone: (631) 543-7100  
Fax: (631) 864-7630

Zetex (Asia) Ltd.  
3701-04 Metroplaza, Tower 1  
Hing Fong Road,  
Kwai Fong, Hong Kong  
Telephone: (852) 26100 611  
Fax: (852) 24250 494

These are supported by  
agents and distributors in  
major countries world-wide  
©Zetex plc 2000

Internet <http://www.zetex.com>

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.



PROVISIONAL ISSUE A - MAY 2001