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A Product Line of  
Diodes Incorporated

# ZETEX

## ZXMP3F37N8 30V SO8 P-channel enhancement mode MOSFET

### Summary

$V_{(BR)DSS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-30	0.025 @ $V_{GS}=-10V$	-10.7
	0.041 @ $V_{GS}=-4.5V$	



### Description

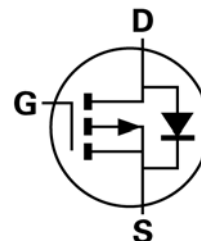
This new generation Trench MOSFET from Zetex has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance making it ideal for high efficiency power management applications.

### Features

- Low on-resistance
- Fast switching speed
- Low gate drive
- SO8 package

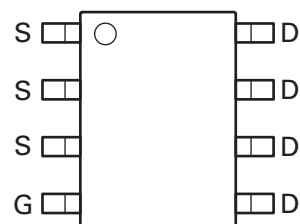
### Applications

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



### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP3F37N8TA	7	12	500



### Device marking

ZXMP 3F37

# DISCONTINUED

## ZXMP3F37N8

### 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) @ $V_{GS} = -10V$ ; $T_A = 70^\circ C$ (b) @ $V_{GS} = -10V$ ; $T_A = 25^\circ C$ (a) @ $V_{GS} = -10V$ ; $T_L = 25^\circ C$ (d)	$I_D$	-8.5 -6.8 -6.4 -10.7	V
Pulsed Drain current (c)	$I_{DM}$	-39.5	A
Continuous Source current (Body diode) (b)	$I_S$	-4.4	A
Pulsed Source current (Body diode) (c)	$I_{SM}$	-39.5	A
Power dissipation at $T_A = 25^\circ C$ (a) Linear derating factor	$P_D$	1.56 12.5	W mW/ $^\circ C$
Power dissipation at $T_A = 25^\circ C$ (b) Linear derating factor	$P_D$	2.8 22.2	W mW/ $^\circ C$
Power dissipation at $T_L = 25^\circ C$ (d) Linear derating factor	$P_D$	4.4 35.4	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)	$R_{\theta JA}$	80	$^\circ C/W$
Junction to ambient (b)	$R_{\theta JA}$	45	$^\circ C/W$
Junction to lead (d)	$R_{\theta JL}$	28.26	$^\circ C/W$

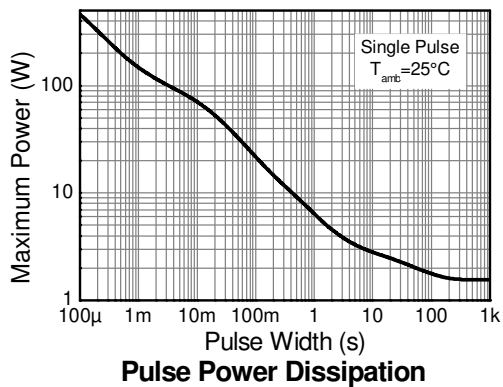
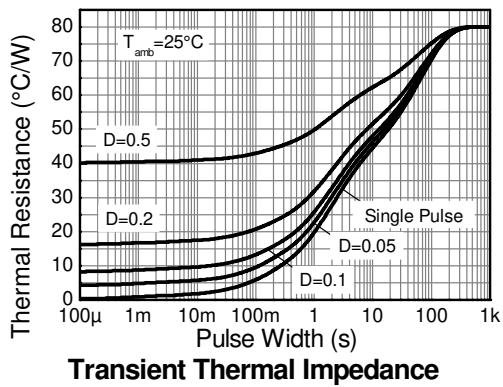
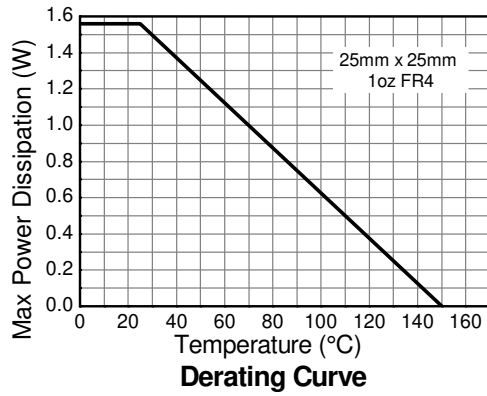
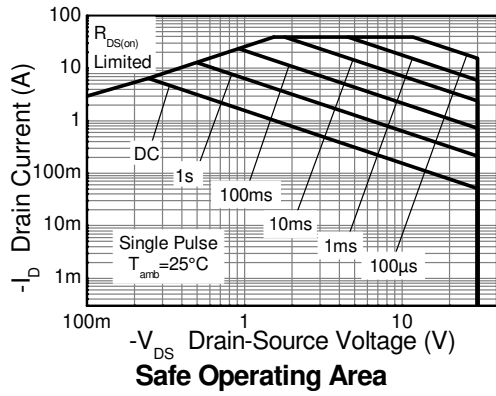
#### NOTES:

- For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- Mounted on FR4 PCB measured at  $t \leq 10$  sec.
- Repetitive rating on 25mm x 25mm FR4 PCB,  $D=0.02$ , pulse width 300us – pulse width limited by maximum junction temperature.
- Thermal resistance from junction to solder-point (at the end of the drain lead).

# DISCONTINUED

## ZXMP3F37N8

### Thermal characteristics



# DISCONTINUED

## ZXMP3F37N8

### 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	$I_{DSS}$			-1.0	$\mu\text{A}$	$V_{DS}=-30\text{V}$ , $V_{GS}=0\text{V}$
Gate-Body leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 20\text{V}$ , $V_{DS}=0\text{V}$
Gate-Source threshold voltage	$V_{GS(th)}$	-1.3		-2.5	V	$I_D = -250\mu\text{A}$ , $V_{DS}=V_{GS}$
Static Drain-Source on-state resistance (*)	$R_{DS(on)}$			0.025 0.041	$\Omega$	$V_{GS} = -10\text{V}$ , $I_D = -7.1\text{A}$ $V_{GS} = -4.5\text{V}$ , $I_D = -5.5\text{A}$
Forward Transconductance (*) (†)	$g_{fs}$		18.6		S	$V_{DS} = -15\text{V}$ , $I_D = -7.1\text{A}$
<b>Dynamic</b> (†)						
Input capacitance	$C_{iss}$		1678		pF	$V_{DS} = -15\text{V}$ , $V_{GS}=0\text{V}$ $f=1\text{MHz}$
Output capacitance	$C_{oss}$		303		pF	
Reverse transfer capacitance	$C_{rss}$		178		pF	
<b>Switching</b> (‡) (†)						
Turn-on-delay time	$t_{d(on)}$		3.5		ns	$V_{DD} = -15\text{V}$ , $V_{GS} = -10\text{V}$ $I_D = -1\text{A}$ $R_G \cong 6.0\Omega$ ,
Rise time	$t_r$		4.9		ns	
Turn-off delay time	$t_{d(off)}$		44		ns	
Fall time	$t_f$		28		ns	
<b>Gate charge</b>						
Total Gate charge	$Q_g$		31.6		nC	$V_{DS} = -15\text{V}$ , $V_{GS} = -10\text{V}$ $I_D = -7.1\text{A}$
Gate-Source charge	$Q_{gs}$		4.3		nC	
Gate-Drain charge	$Q_{gd}$		6.2		nC	
<b>Source-Drain diode</b>						
Diode forward voltage (*)	$V_{SD}$		-0.80	-1.2	V	$I_S = -1.7\text{A}$ , $V_{GS}=0\text{V}$
Reverse recovery time (‡)	$t_{rr}$		16.2		ns	$I_S = -2.2\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$
Reverse recovery charge (‡)	$Q_{rr}$		10		nC	

#### NOTES:

(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

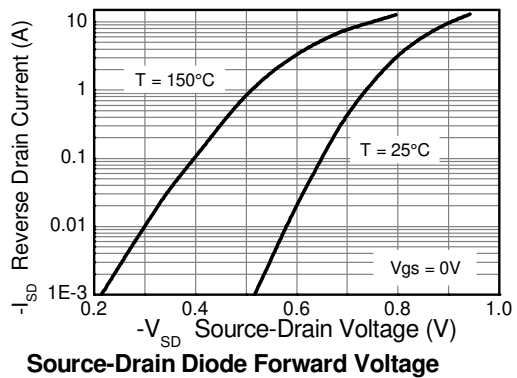
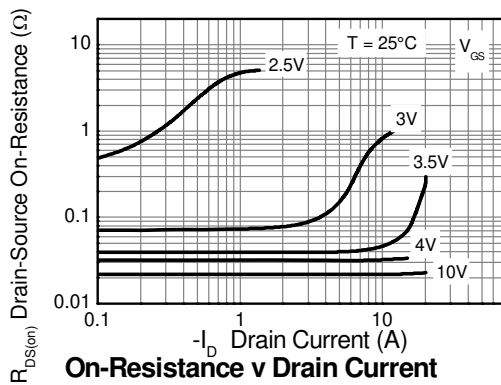
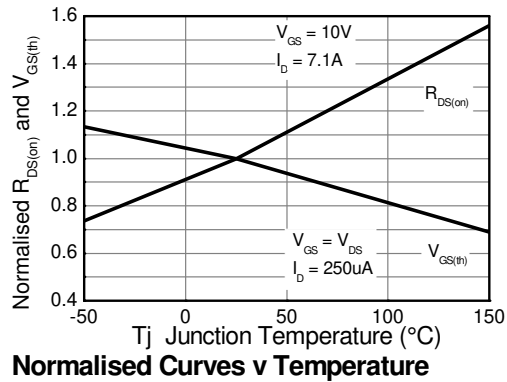
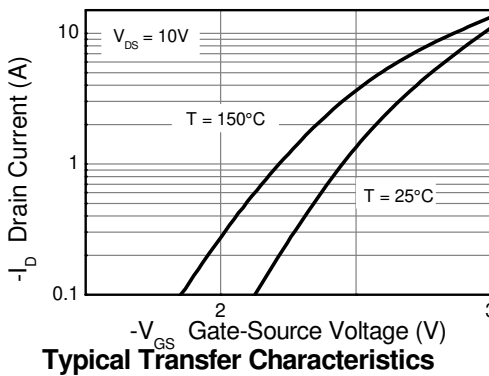
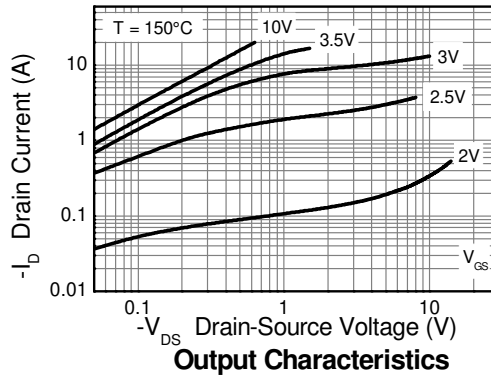
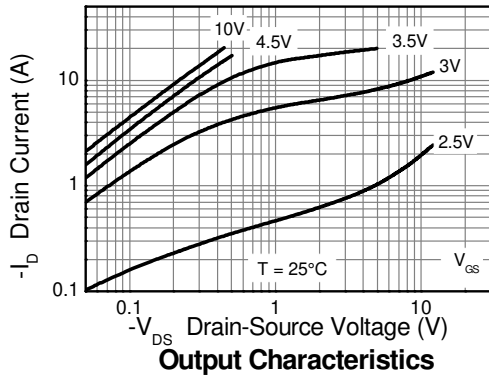
(†) Switching characteristics are independent of operating junction temperature.

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

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## ZXMP3F37N8

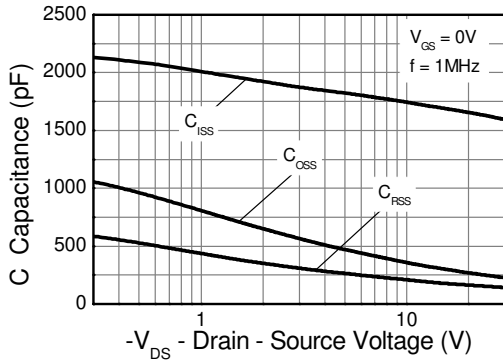
### Typical characteristics



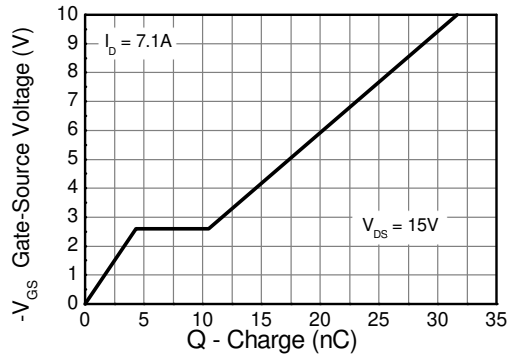
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## ZXMP3F37N8

### Typical characteristics

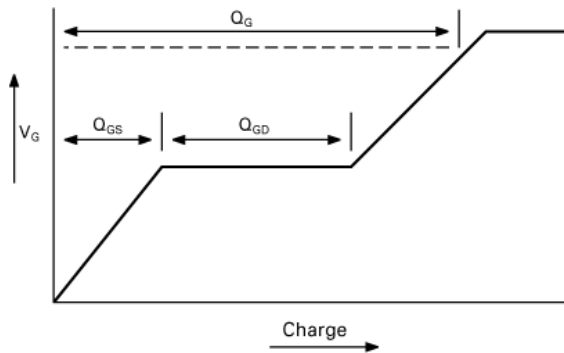


Capacitance v Drain-Source Voltage

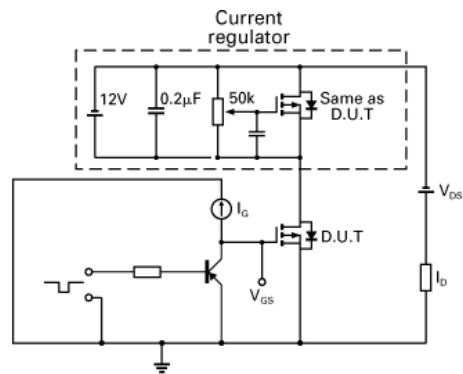


Gate-Source Voltage v Gate Charge

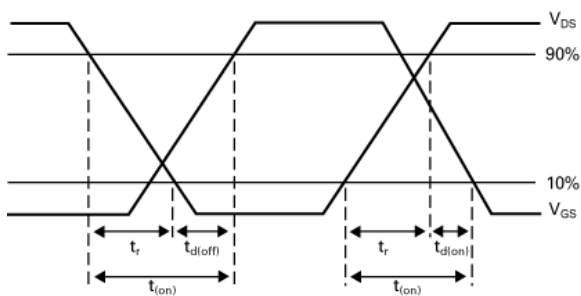
### Test circuits



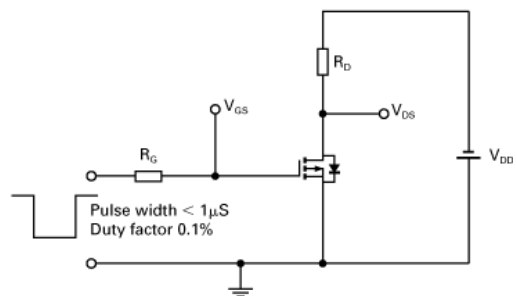
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

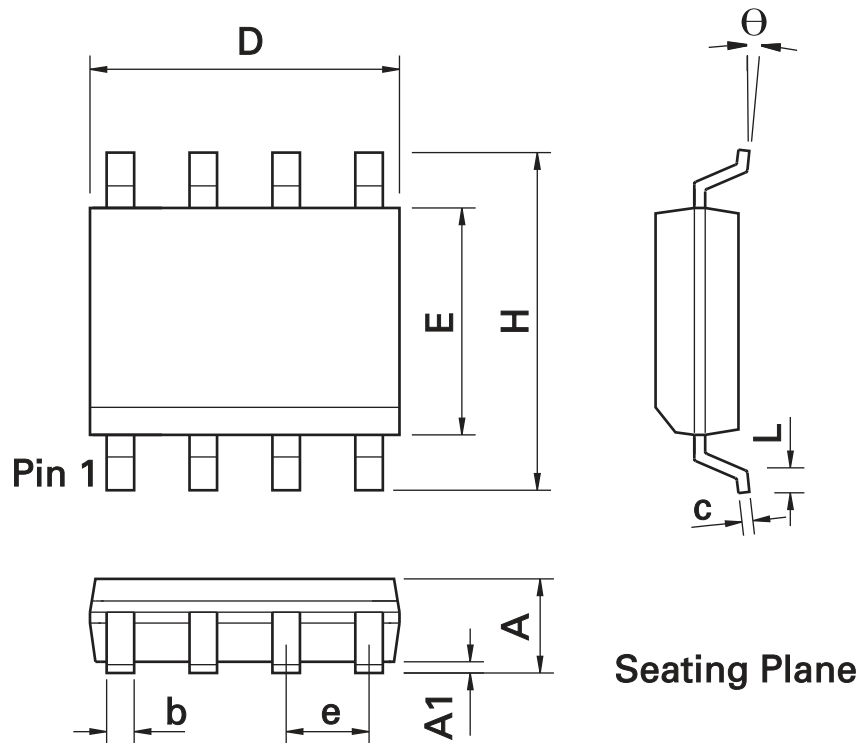


Switching time test circuit

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## ZXMP3F37N8

### Package outline SO8



### SO8 Package Information

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.053	0.069	1.35	1.75	e	0.050 BSC		1.27 BSC	
A1	0.004	0.010	0.10	0.25	b	0.013	0.020	0.33	0.51
D	0.189	0.197	4.80	5.00	c	0.008	0.010	0.19	0.25
H	0.228	0.244	5.80	6.20	U	0°	8°	0°	8°
E	0.150	0.157	3.80	4.00	h	0.010	0.020	0.25	0.50
L	0.016	0.050	0.40	1.27	-	-	-	-	-

**Note:** Controlling dimensions are in inches. Approximate dimensions are provided in millimeters

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## ZXMP3F37N8

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"Not recommended for new designs"	Device is still in production to support existing designs and production
"Obsolete"	Production has been discontinued

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