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A Product Line of
Diodes Incorporated



ZXMP3F37N8 30V SO8 P-channel enhancement mode MOSFET

Summary

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



Description

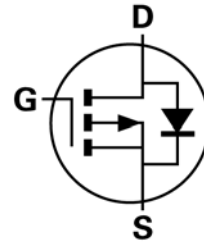
This new generation Trench MOSFET from Zetex has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance making it ideal for high efficiency power management applications.

Features

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

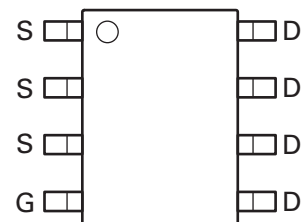
Applications

- 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

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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 @ $V_{GS} = -10V$; $T_A = 25^\circ C$ ^(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	$^\circ C/W$

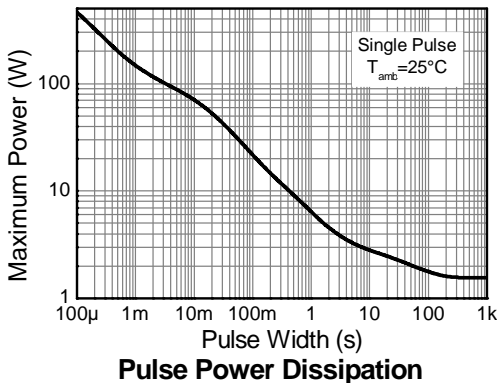
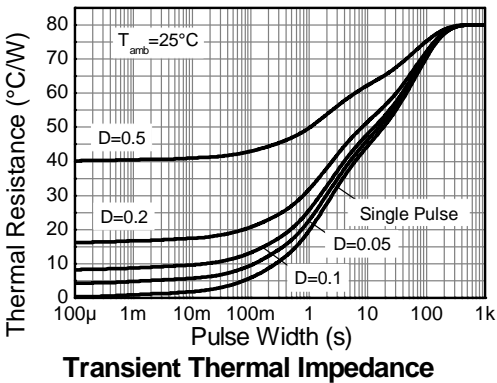
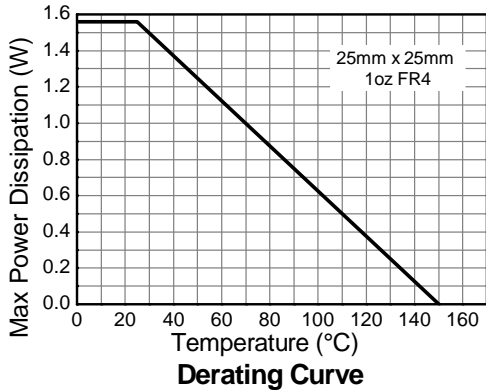
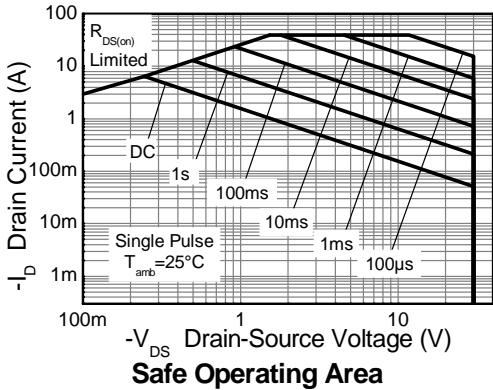
NOTES:

- (a) 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.
- (b) Mounted on FR4 PCB measured at $t \leq 10$ sec.
- (c) Repetitive rating on 25mm x 25mm FR4 PCB, $D=0.02$, pulse width 300us – pulse width limited by maximum junction temperature.
- (d) Thermal resistance from junction to solder-point (at the end of the drain lead).

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Thermal 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}			-1.0	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	$V_{GS(th)}$	-1.3		-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	Ω	$V_{GS} = -10\text{V}$, $I_D = -7.1\text{A}$ $V_{GS} = -4.5\text{V}$, $I_D = -5.5\text{A}$
Forward Transconductance (*) (†)	g_{fs}		18.6		S	$V_{DS} = -15\text{V}$, $I_D = -7.1\text{A}$
Dynamic (†)						
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	
Switching (‡) (†)						
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	
Gate charge						
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	
Source-Drain diode						
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 $\leq 2\%$.

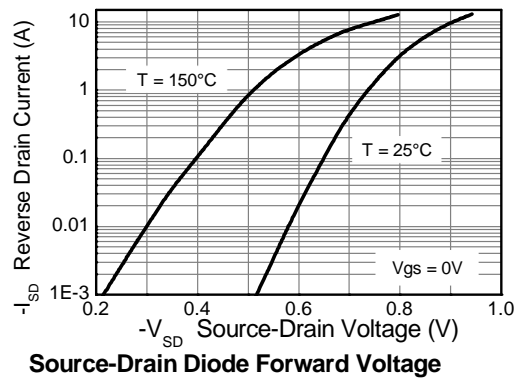
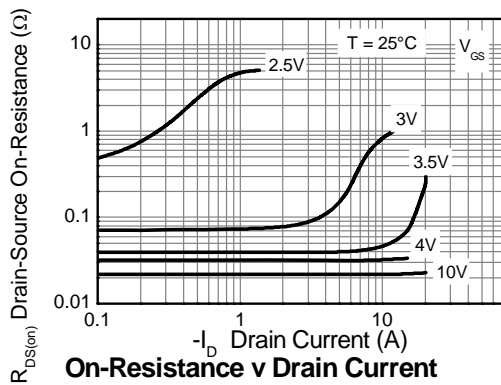
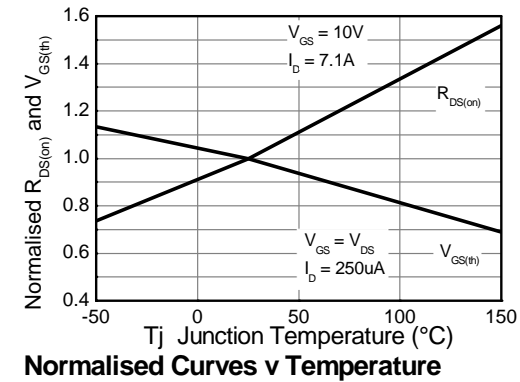
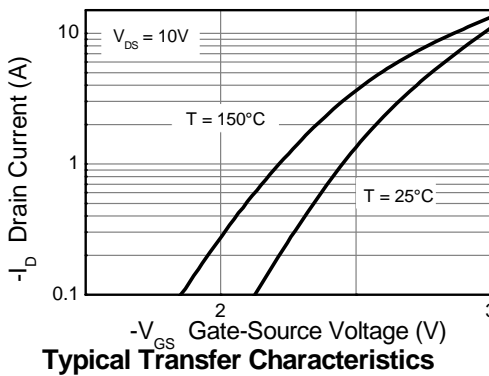
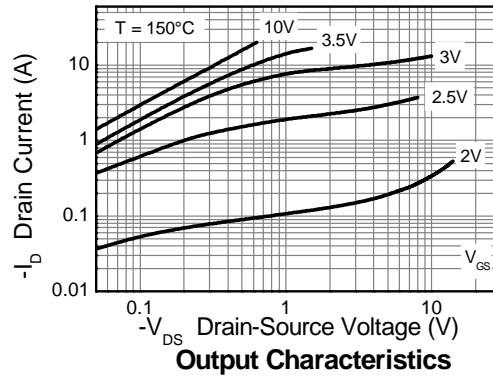
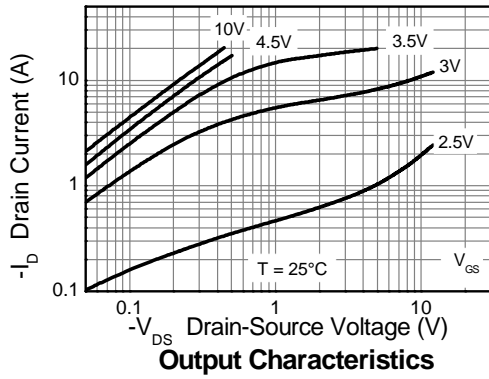
(†) Switching characteristics are independent of operating junction temperature.

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

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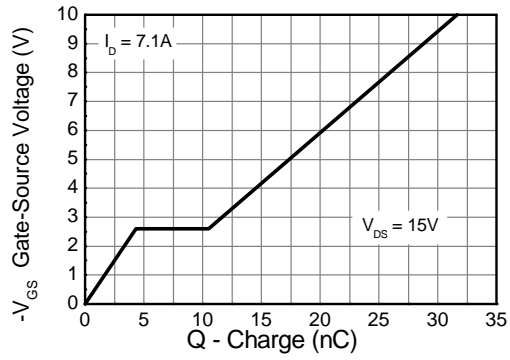
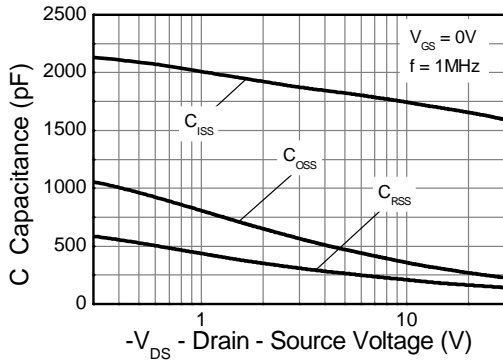
Typical characteristics



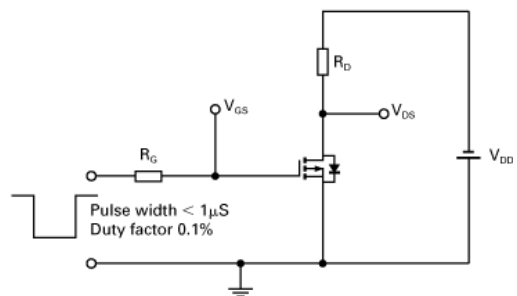
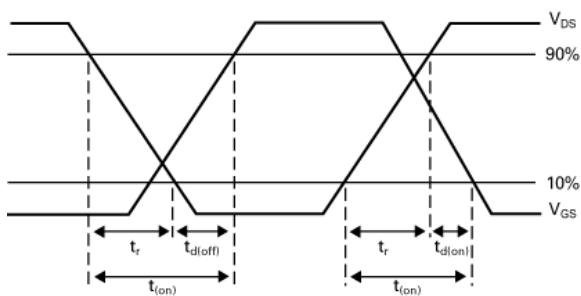
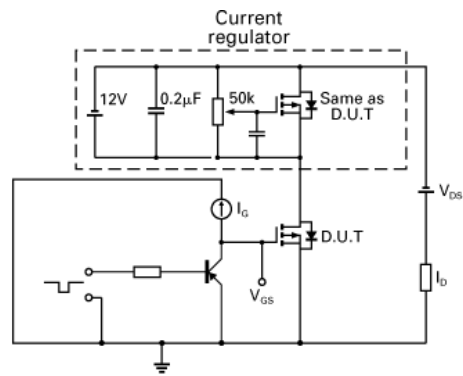
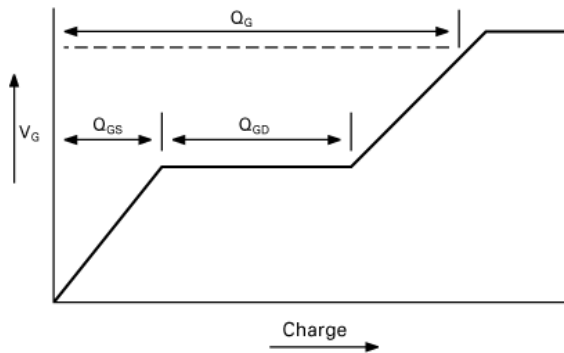
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Typical characteristics



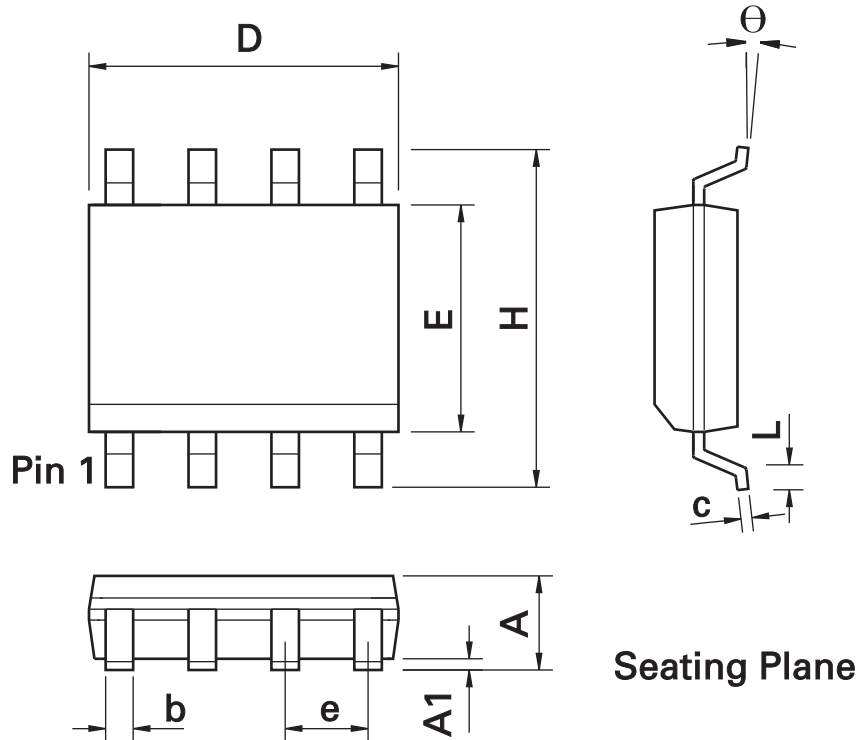
Test circuits



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

Datasheet status key:

"Draft version"	This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.
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