

ZXMP3F37DN8

30V SO8 Dual P-channel enhancement mode MOSFET

Summary

$V_{(BR)DSS}$ (V)	$R_{DS(on)}$ (Ω)	I_D (A)
-30	0.025 @ $V_{GS}=-10V$	-8.3
	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
- Dual SO8 package

Applications

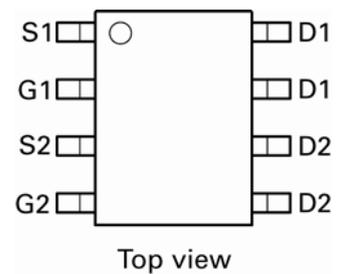
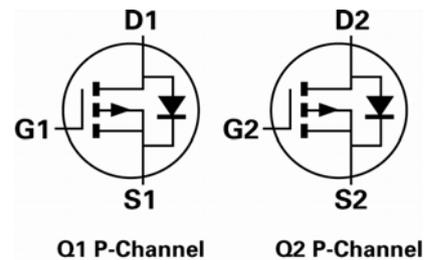
- DC-DC Converters
- Power management functions
- Disconnect switches
- Motor control

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP3F37DN8TA	7	12	500

Device marking

ZXMP 3F37D



ZXMP3F37DN8

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)(d)	I_D	-7.3	V
@ $V_{GS} = -10V$; $T_A = 70^\circ C$ (b)(d)		-5.9	
@ $V_{GS} = -10V$; $T_A = 25^\circ C$ (a)(d)		-5.7	
@ $V_{GS} = -10V$; $T_L = 25^\circ C$ (f)		-8.3	
Pulsed Drain current (c)	I_{DM}	-36	A
Continuous Source current (Body diode) (b)	I_S	-3.5	A
Pulsed Source current (Body diode) (c)	I_{SM}	-36	A
Power dissipation at $T_A = 25^\circ C$ (a)(d)	P_D	1.25	W
Linear derating factor		10	mW/ $^\circ C$
Power dissipation at $T_A = 25^\circ C$ (a)(e)	P_D	1.8	W
Linear derating factor		14	mW/ $^\circ C$
Power dissipation at $T_L = 25^\circ C$ (b)(d)	P_D	2.1	W
Linear derating factor		17	mW/ $^\circ C$
Power dissipation at $T_L = 25^\circ C$ (a)(f)	P_D	2.7	W
Linear derating factor		21.5	mW/ $^\circ C$
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	$^\circ C$

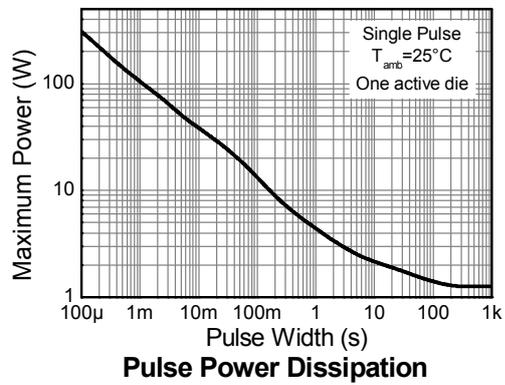
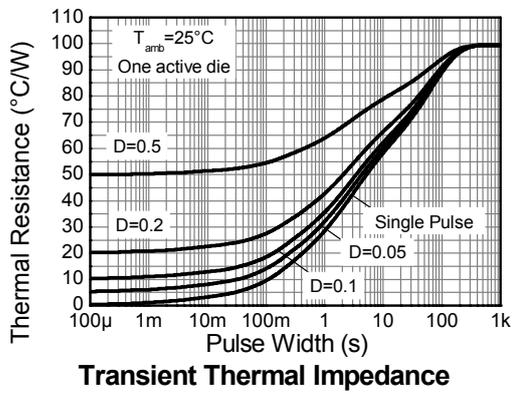
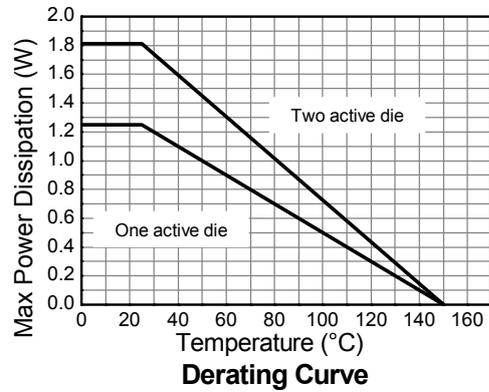
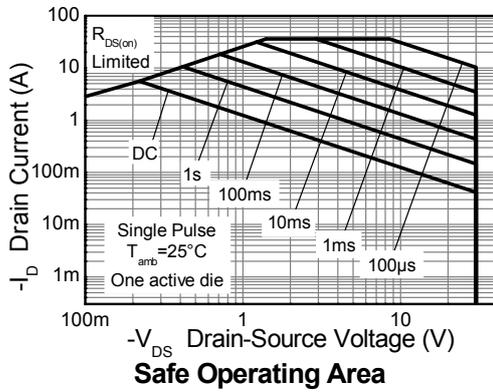
Thermal resistance

Parameter	Symbol	Value	Unit
Junction to ambient (a)(d)	$R_{\theta JA}$	100	$^\circ C/W$
Junction to ambient (b)(e)	$R_{\theta JA}$	70	$^\circ C/W$
Junction to ambient (b)(d)	$R_{\theta JA}$	60	$^\circ C/W$
Junction to lead (a)(f)	$R_{\theta JL}$	46.42	$^\circ C/W$

NOTES:

- For a dual device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
- For a dual device surface 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.
- For a dual device with one active die.
- For a dual device with 2 active die running at equal power.
- Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal characteristics



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Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated) Q1 and Q2

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	$V_{DS}=-Y\text{V}, V_{GS}=0\text{V}$
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	

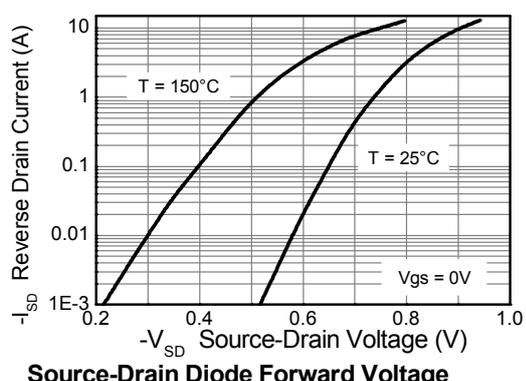
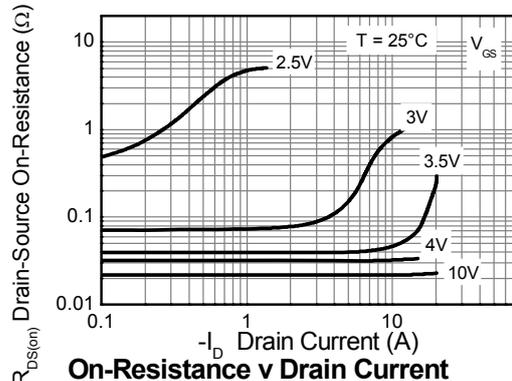
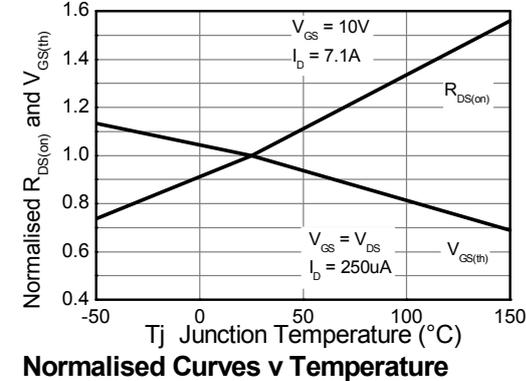
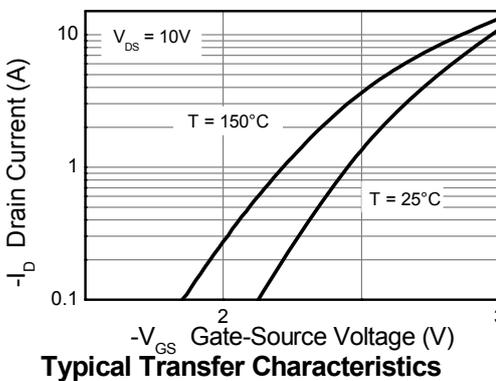
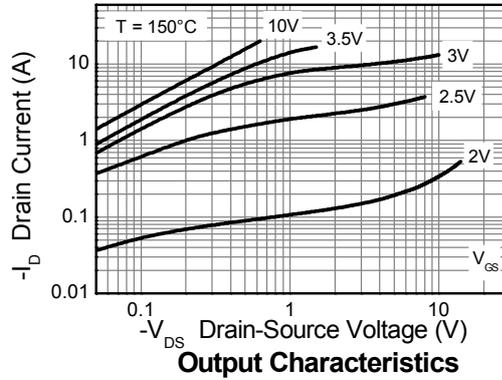
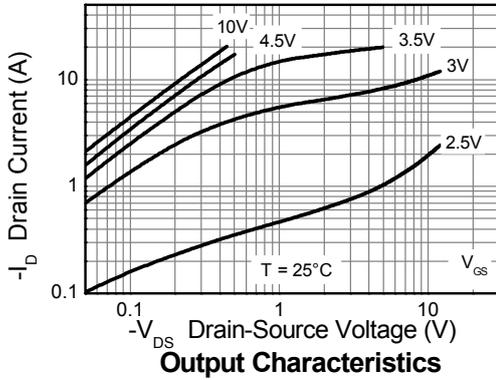
NOTES:

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

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

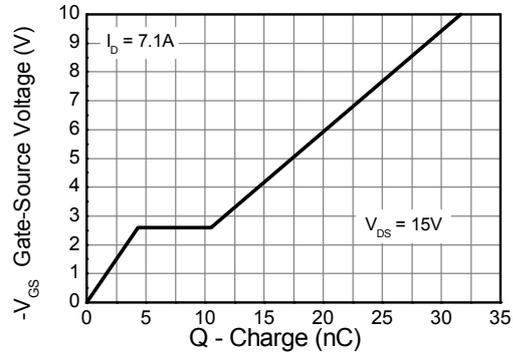
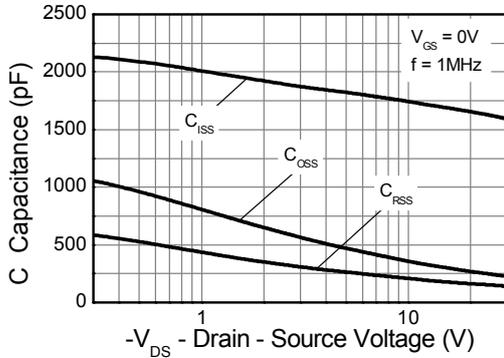
(‡) For design aid only, not subject to production testing

Typical characteristics

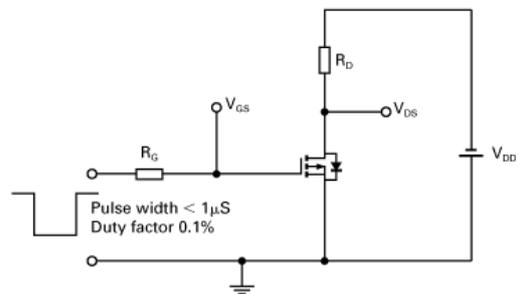
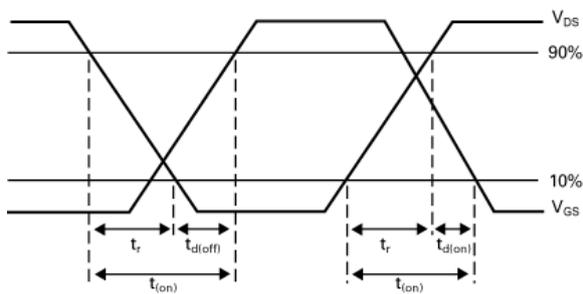
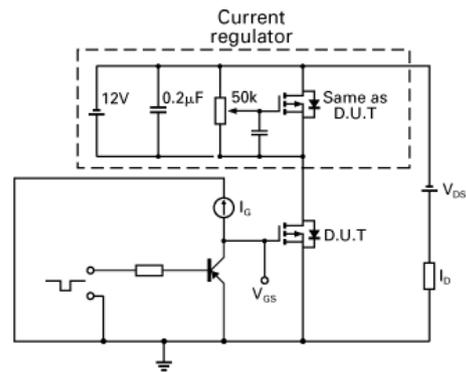
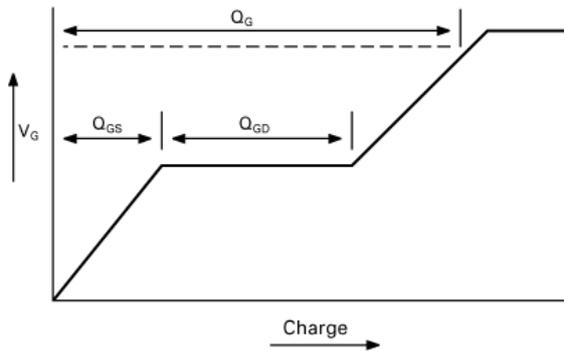


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Typical characteristics

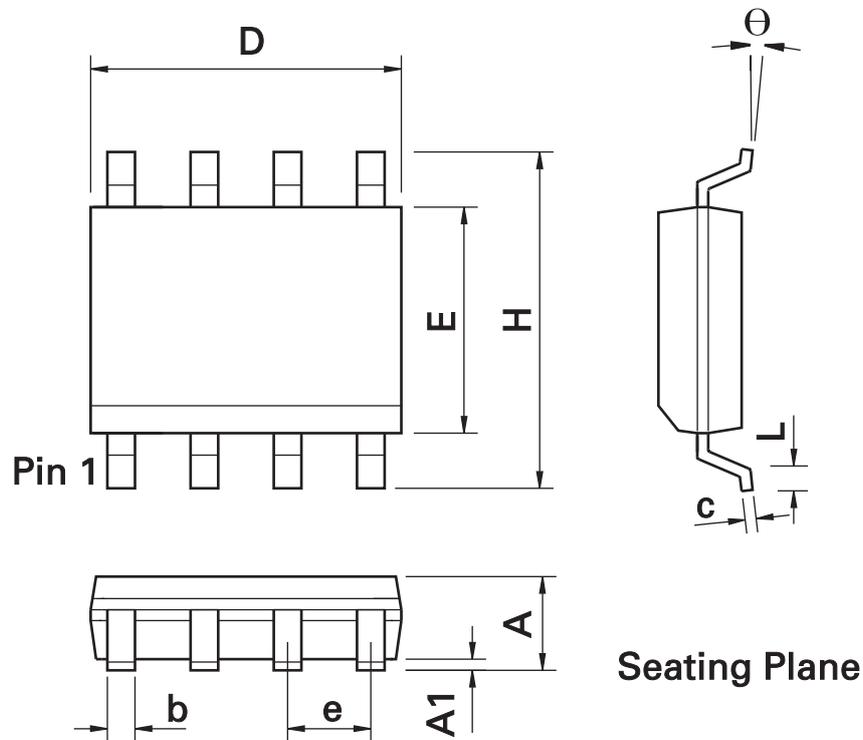


Test circuits



ZXMP3F37DN8

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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