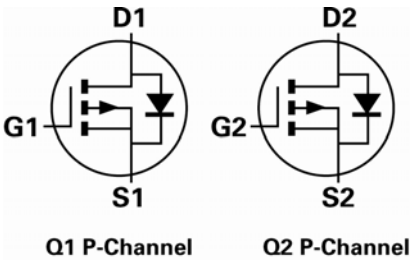
ZXMP3F37DN8
30V SO8 Dual P-channel enhancement mode MOSFET

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.

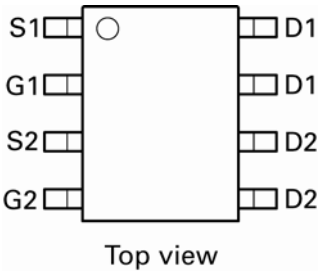


Features

- 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

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°C (b)(d) @ V_{GS}= -10V; T_A=70°C (b)(d) @ V_{GS}= -10V; T_A=25°C (a)(d) @ V_{GS}= -10V; T_L=25°C (f)	I_D	-7.3 -5.9 -5.7 -8.3	V
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°C (a)(d) Linear derating factor	P_D	1.25 10	W mW/°C
Power dissipation at T_A =25°C (a)(e) Linear derating factor	P_D	1.8 14	W mW/°C
Power dissipation at T_L =25°C (b)(d) Linear derating factor	P_D	2.1 17	W mW/°C
Power dissipation at T_L =25°C (a)(f) Linear derating factor	P_D	2.7 21.5	W mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

Thermal resistance

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

NOTES:

(a) 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.

(b) For a dual device surface mounted on FR4 PCB measured at t ≤ 10 sec.

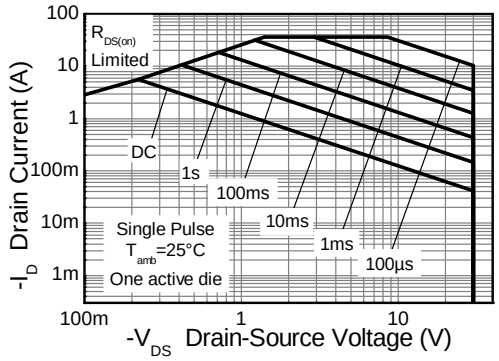
(c) Repetitive rating on 25mm x 25mm FR4 PCB, D=0.02, pulse width 300us – pulse width limited by maximum junction temperature.

(d) For a dual device with one active die.

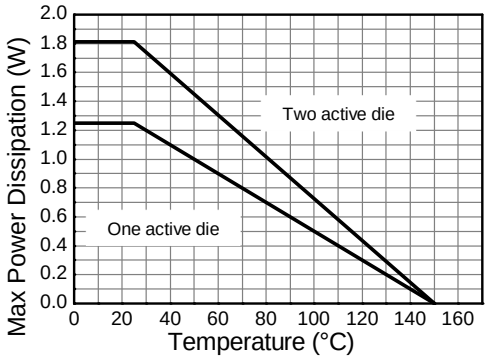
(e) For a dual device with 2 active die running at equal power.

(f) Thermal resistance from junction to solder-point (at the end of the drain lead).

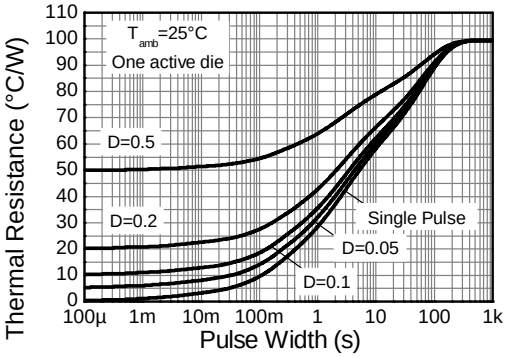
Thermal characteristics



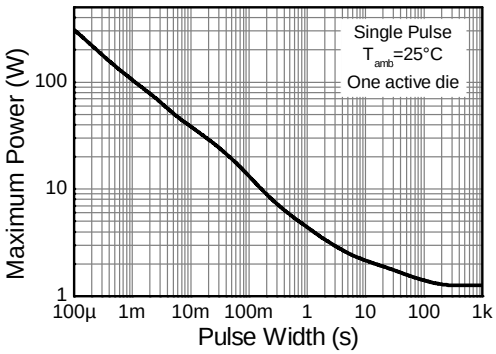
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

Electrical characteristics (at T_{amb} = 25°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 = -250μA, V_{GS}=0V
Zero Gate voltage Drain current	I_{DSS}			-1.0	μA	V_{DS}=-YV, V_{GS}=0V
Gate-Body leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-Source threshold voltage	$V_{GS(th)}$	-1.3		-2.5	V	I_D= -250μA, V_{DS}=V_{GS}
Static Drain-Source on-state resistance (*)	$R_{DS(on)}$			0.025 0.041	Ω	V_{GS}= -10V, I_D= -7.1A V_{GS}= -4.5V, I_D= -5.5A
Forward Transconductance (*) (†)	g_{fs}		18.6		S	V_{DS}= -15V, I_D= -7.1A
Dynamic (†)						
Input capacitance	C_{iss}		1678		pF	V_{DS}= -15V, V_{GS}=0V f=1MHz
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}= -15V, V_{GS}= -10V I_D= -1A $R_G \cong 6.0\Omega$,
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}= -15V, V_{GS}= -10V I_D= -7.1A
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= -1.7A,V_{GS}=0V
Reverse recovery time (‡)	t_{rr}		16.2		ns	I_S= -2.2A,di/dt=100A/μs
Reverse recovery charge(‡)	Q_{rr}		10		nC	

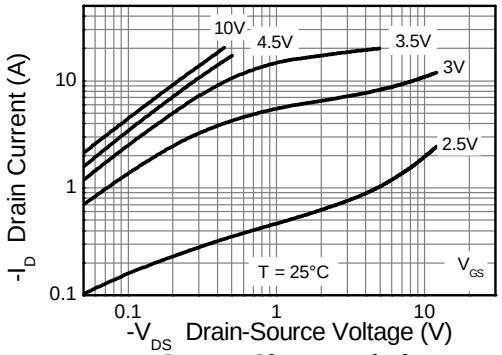
NOTES:

(*) Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.

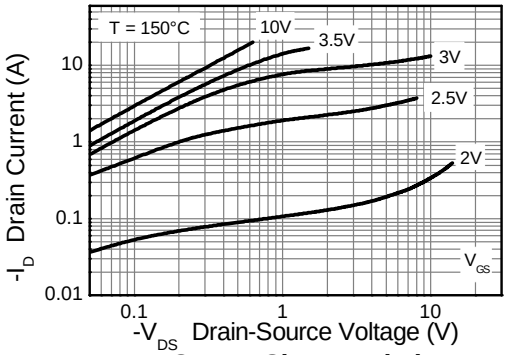
(†)Switching characteristics are independent of operating junction temperature.

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

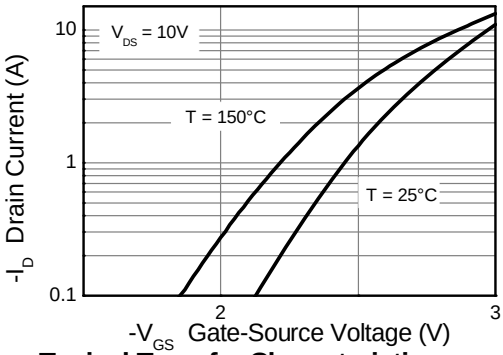
Typical characteristics



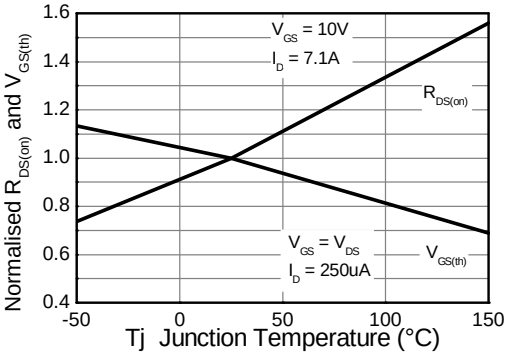
Output Characteristics



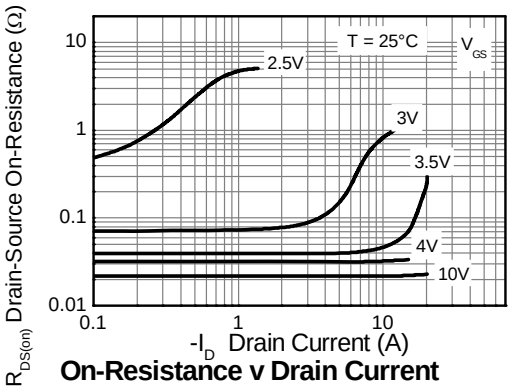
Output Characteristics



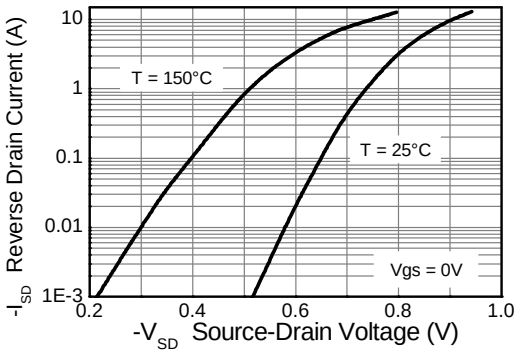
Typical Transfer Characteristics



Normalised Curves v Temperature

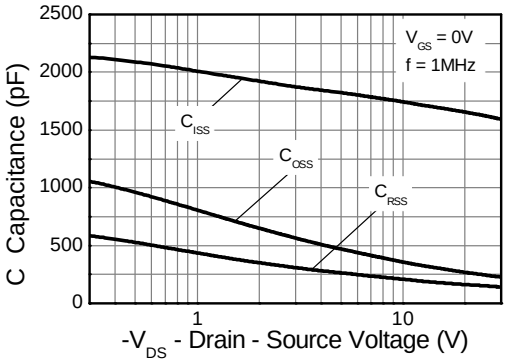


On-Resistance v Drain Current

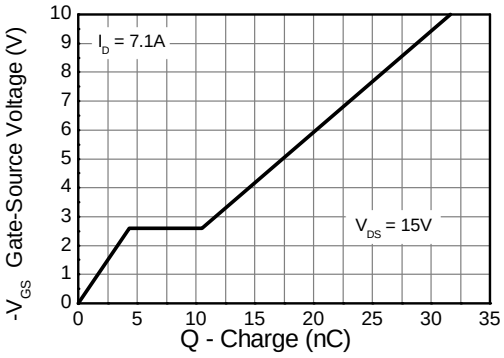


Source-Drain Diode Forward Voltage

Typical characteristics

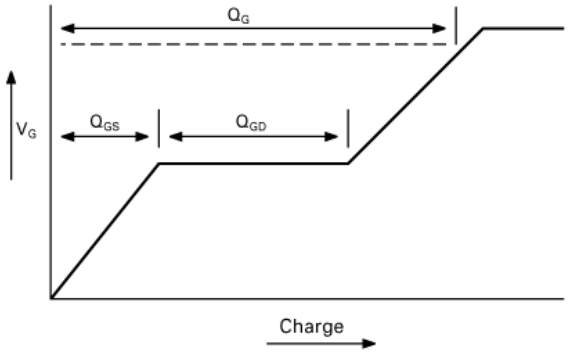


Capacitance v Drain-Source Voltage

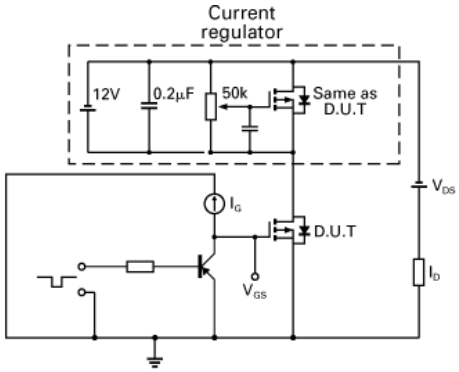


Gate-Source Voltage v Gate Charge

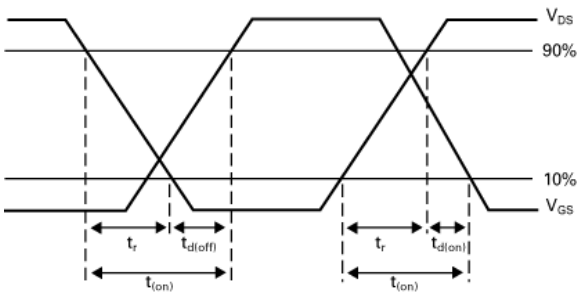
Test circuits



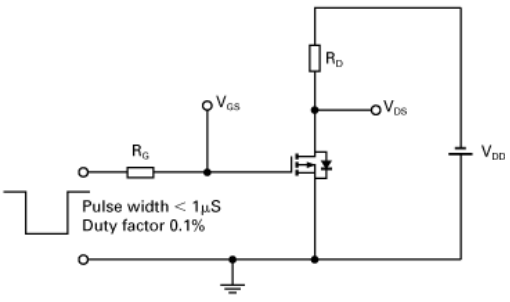
Basic gate charge waveform



Gate charge test circuit

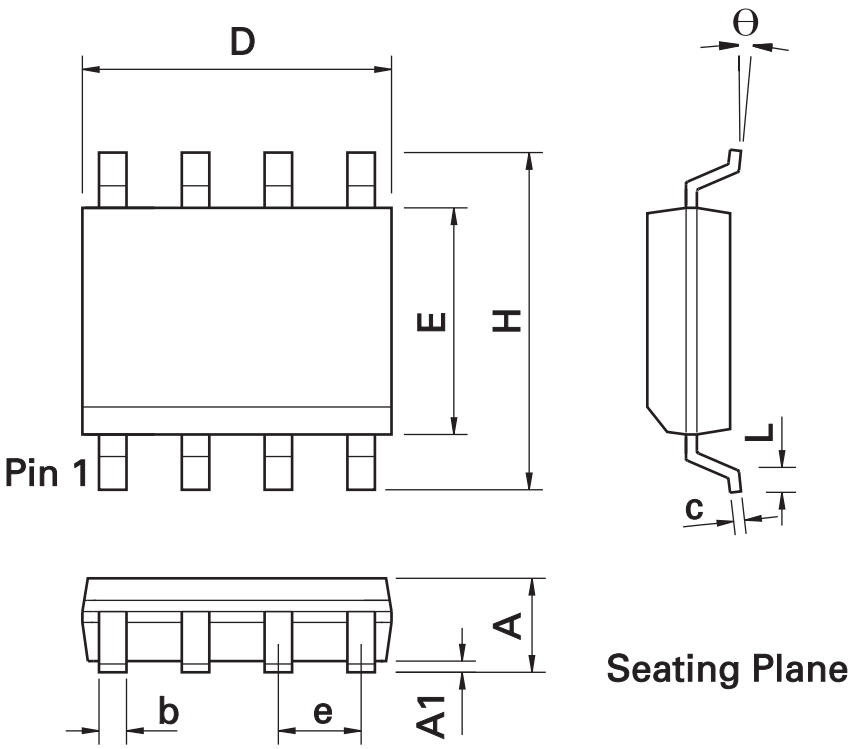


Switching time waveforms



Switching time test circuit

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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