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A Product Line of
Diodes Incorporated

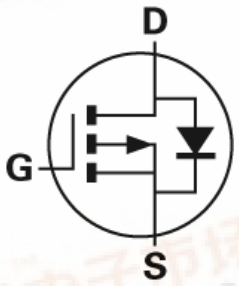
ZXMP3F35N8
30V SO8 P-channel enhancement mode MOSFET

Summary

$V_{(BR)DSS}$ (V)	$R_{DS(on)}$ (Ω)	I_D(A)
-30	0.012 @ V_{GS}=-10V	-17.1
	0.018 @ 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 battery protection and reverse connection applications

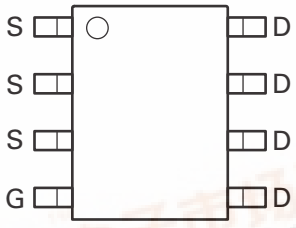


Features

- Low on-resistance
- Low gate drive
- SO8 package

Applications

- Power management functions
- Disconnect switches
- Reverse battery protection



Top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP3F35N8TA	7	12	500

Device marking

ZXMP 3F35

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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°C (b) @ V_{GS}= -10V; T_A=70°C (b) @ V_{GS}= -10V; T_A=25°C (a) @ V_{GS}= -10V; T_L=25°C (d)	I_D	-12.3 -9.9 -9.3 -17.1	V
Pulsed Drain current (c)	I_{DM}	-58	A
Continuous Source current (Body diode) (b)	I_S	-4.9	A
Pulsed Source current (Body diode) (c)	I_{SM}	-58	A
Power dissipation at T_A =25°C (a) Linear derating factor	P_D	1.56 12.5	W mW/°C
Power dissipation at T_A =25°C (b) Linear derating factor	P_D	2.8 22.2	W mW/°C
Power dissipation at T_L =25°C (d) Linear derating factor	P_D	5.35 42.9	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)	$R_{\theta JA}$	80	°C/W
Junction to ambient (b)	$R_{\theta JA}$	45	°C/W
Junction to lead (d)	$R_{\theta JL}$	23.33	°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 ≤ 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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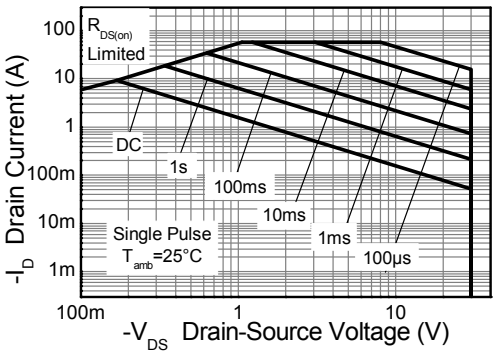
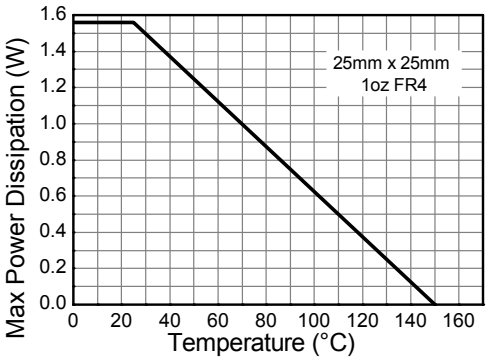
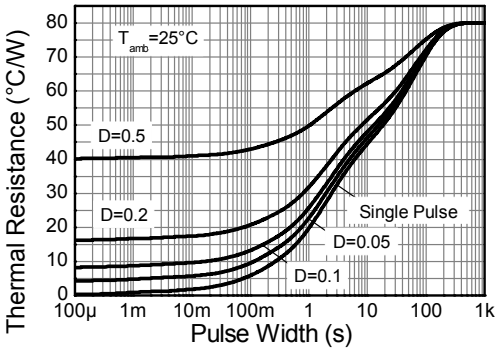
Thermal characteristics



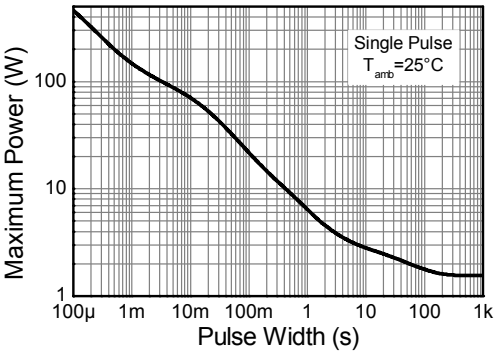
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

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}=-30V, V_{GS}=0V
Gate-Body leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-Source threshold voltage	$V_{GS(th)}$	-1.4		-2.6	V	I_D= -250μA, V_{DS}=V_{GS}
Static Drain-Source on-state resistance (*)	$R_{DS(on)}$			0.012 0.018	Ω	V_{GS}= -10V, I_D= -12A V_{GS}= -4.5V, I_D= -10A
Forward Transconductance (*) (†)	g_{fs}		35		S	V_{DS}= -15V, I_D= -12A
Dynamic (†)						
Input capacitance	C_{iss}		4600		pF	V_{DS}= -15V, V_{GS}=0V f=1MHz
Output capacitance	C_{oss}		730		pF	
Reverse transfer capacitance	C_{rss}		466		pF	
Switching (‡) (†)						
Turn-on-delay time	$t_{d(on)}$		5.4		ns	V_{DD}= -15V, V_{GS}= -10V I_D= -1A $R_G \cong 6.0\Omega$,
Rise time	t_r		9.9		ns	
Turn-off delay time	$t_{d(off)}$		103		ns	
Fall time	t_f		55.6		ns	
Gate charge						
Total Gate charge	Q_g		77.1		nC	V_{DS}= -15V, V_{GS}= -10V I_D= -12A
Gate-Source charge	Q_{gs}		11.6		nC	
Gate-Drain charge	Q_{gd}		15.7		nC	
Source–Drain diode						
Diode forward voltage (*)	V_{SD}		-0.73	-1.2	V	I_S= -1.7A,V_{GS}=0V
Reverse recovery time (‡)	t_{rr}		20.6		ns	I_S= -3A,di/dt=100A/μs
Reverse recovery charge(‡)	Q_{rr}		12.4		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

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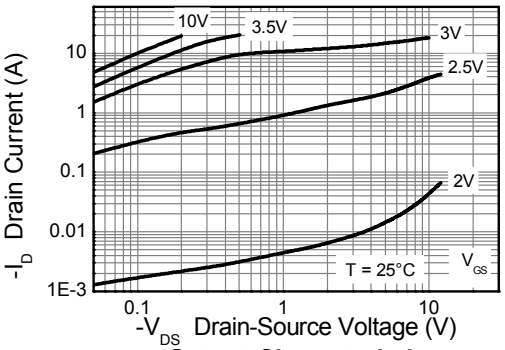
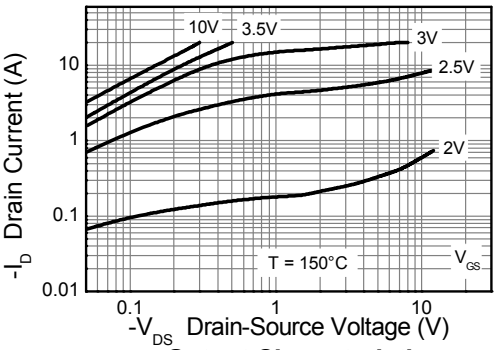
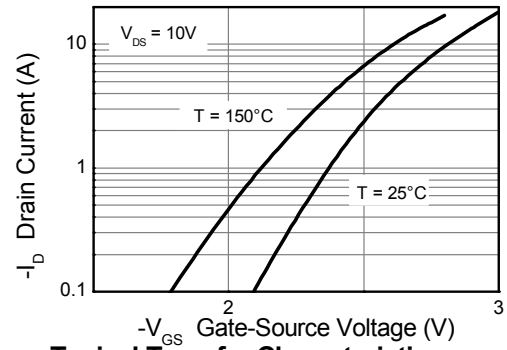
Typical characteristics



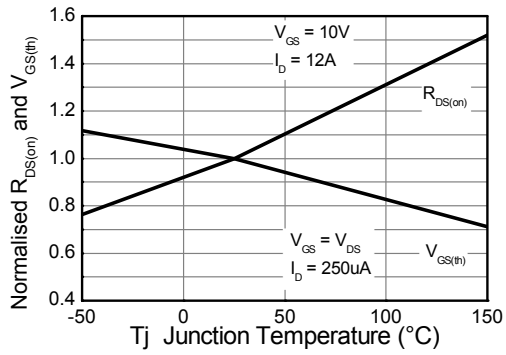
Output Characteristics



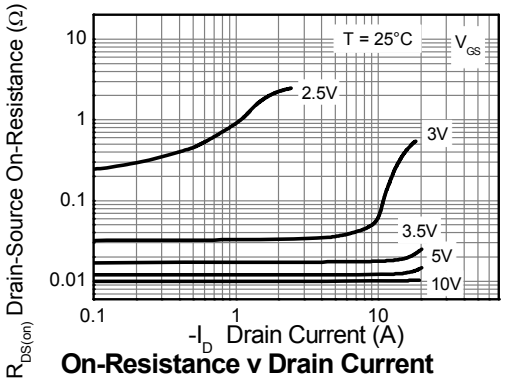
Output Characteristics



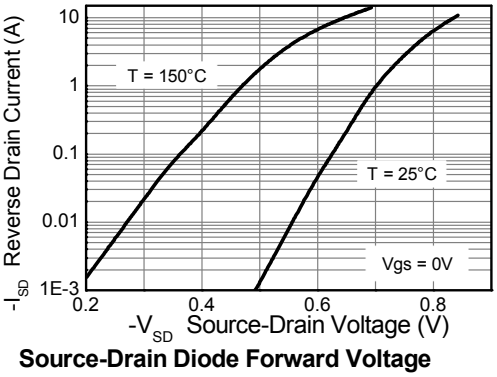
Typical Transfer Characteristics



Normalised Curves v Temperature



On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

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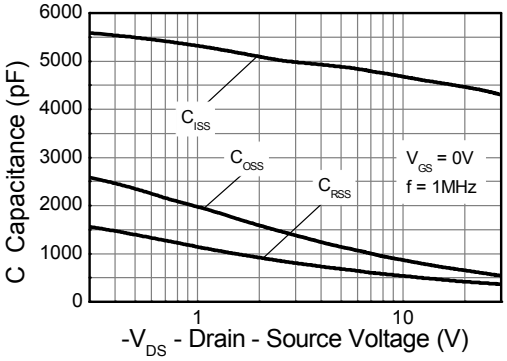
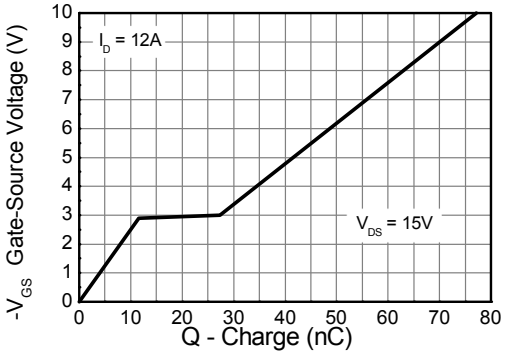
Typical characteristics

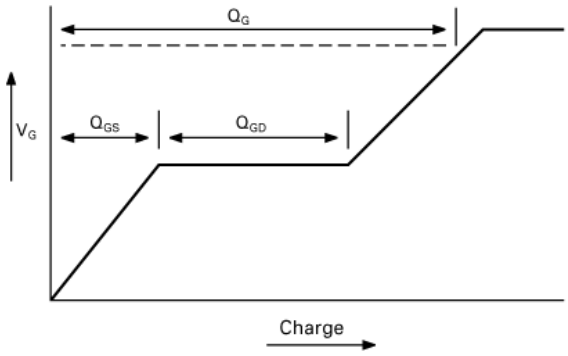


Capacitance v Drain-Source Voltage

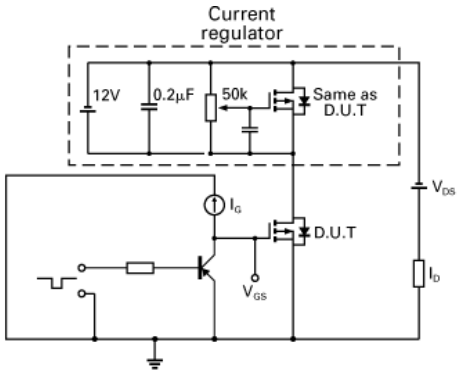


Gate-Source Voltage v Gate Charge

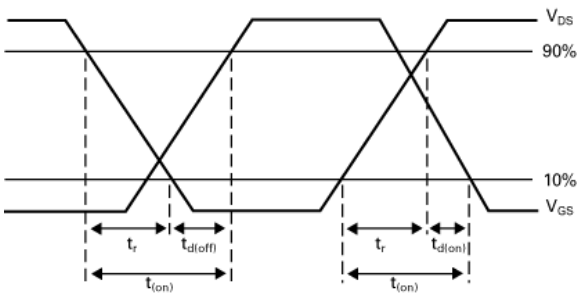
Test circuits



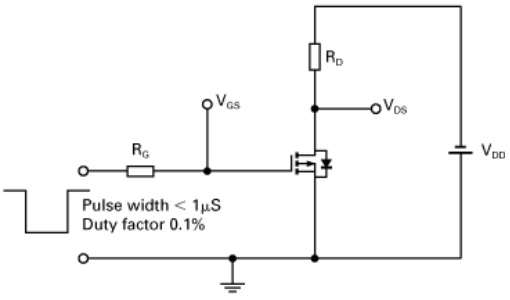
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



Switching time test circuit

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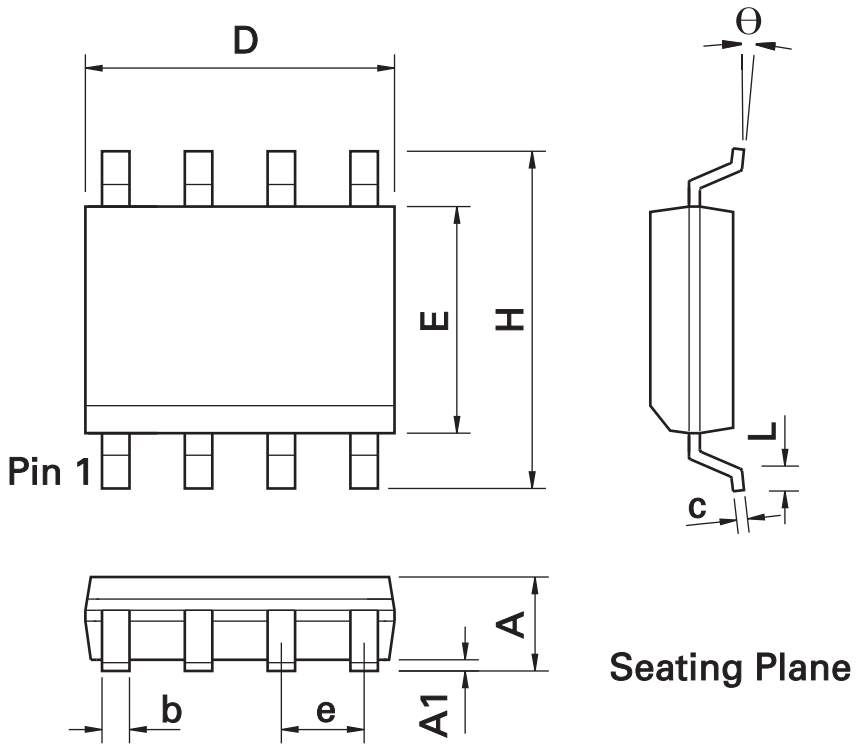
Package outline SO8



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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