ZXMN3F30FH
30V SOT23 N-channel enhancement mode MOSFET

Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ (Ω)	I_D (A)
30	0.047 @ V_{GS}= 10V	4.6
	0.065 @ V_{GS}= 4.5V	4.0

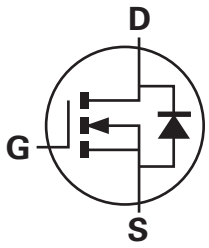


Description

This new generation Trench MOSFET from Zetex features low on-resistance achievable with 4.5V gate drive.

Features

- Low on-resistance
- 4.5V gate drive capability
- SOT23



Applications

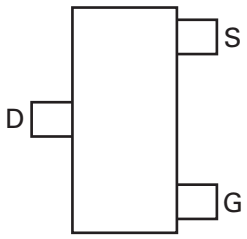
- DC-DC Converters
- Power management functions
- Motor Control

Ordering information

DEVICE	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN3F30FHTA	7	8	3000

Device marking

KNA



Top view

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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
Continous Drain Current @ V_{GS}=4.5; T_A=25°C(b) @ V_{GS}=4.5; T_A=70°C(b) @ V_{GS}=4.5; T_A=25°C(a)	I_D	4.6 3.7 3.8	A A A
Pulsed drain current(c)	I_{DM}	21	A
Continuous source current (body diode)(b)	I_S	2.2	A
Pulsed source current (body diode)(c)	I_{SM}	21	A
Power dissipation at T_A =25°C(a) Linear derating factor	P_D	0.95 7.6	W mW/°C
Power dissipation at T_A =25°C(b) Linear derating factor	P_D	1.4 11.2	W mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient(a)	$R_{\Theta JA}$	131	°C/W
Junction to ambient(b)	$R_{\Theta JA}$	89	°C/W
Junction to lead(d)	$R_{\Theta JL}$	68	°C/W

NOTES:

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) For a device surface mounted on FR4 PCB measured at t ≤ 5 sec.

(c) Repetitive rating - 25mm x 25mm FR4 PCB, D=0.02, pulse width 300μs - 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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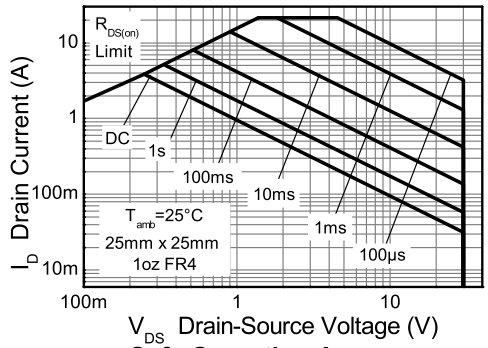
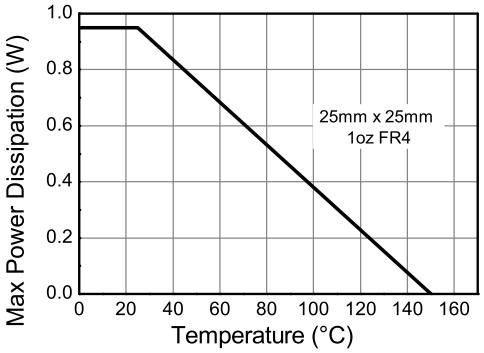
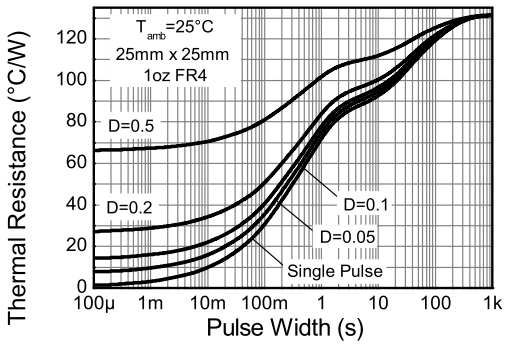
Thermal characteristics



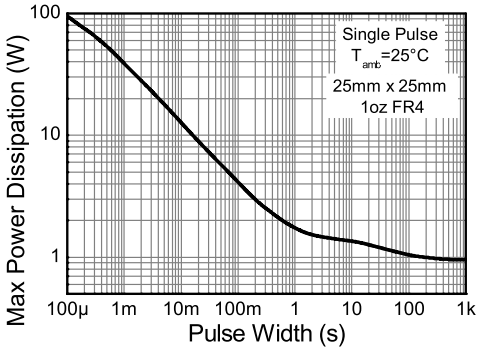
Safe Operating Area



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}			0.5	μA	V_{DS}= 30V, V_{GS}=0V
Gate-body leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-Source threshold voltage	$V_{GS(th)}$	1.0		3.0	V	I_D= 250μA, V_{DS}=V_{GS}
Static Drain-Source on-state resistance (*)	$R_{DS(on)}$			0.047 0.065	Ω Ω	V_{GS}= 10V, I_D= 3.2A V_{GS}= 4.5V, I_D= 2.8A
Forward transconductance(*)(†)	g_{fs}		5.2		S	V_{DS}= 15V, I_D= 2.5A
Dynamic (†)						
Input capacitance	C_{iss}		318		pF	V_{DS}= 15V, V_{GS}=0V f=1MHz
Output capacitance	C_{oss}		75		pF	
Reverse transfer capacitance	C_{rss}		45		pF	
Switching(†) (‡)						
Turn-on-delay time	$t_{d(on)}$		1.6		ns	V_{DD}= 15V, V_{GS}= 10V I_D= 1A $R_G \approx 6.0\Omega$
Rise time	t_r		2.6		ns	
Turn-off delay time	$t_{d(off)}$		17		ns	
Fall time	t_f		9.3		ns	
Total gatecharge	Q_g		7.7		nC	V_{DS}= 15V, V_{GS}= 10V I_D= 2.5A
Gate-Source charge	Q_{gs}		1		nC	
Gate-Drain charge	Q_{gd}		1.8		nC	
Source-drain diode						
Diode forward voltage(*)	V_{SD}		0.73	1.2	V	I_S= 1.25A, V_{GS}=0V
Reverse recovery time(†)	t_{rr}		12		ns	T_j=25°C, I_F=1.6A di/dt=100A/μs
Reverse recovery charge(†)	Q_{rr}		4.8		nC	

NOTES:
(*) Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤2%.
(†) For design aid only, not subject to production testing.
(‡) Switching characteristics are independent of operating junction temperature.

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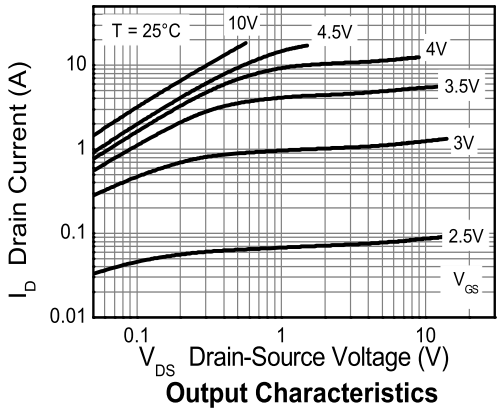
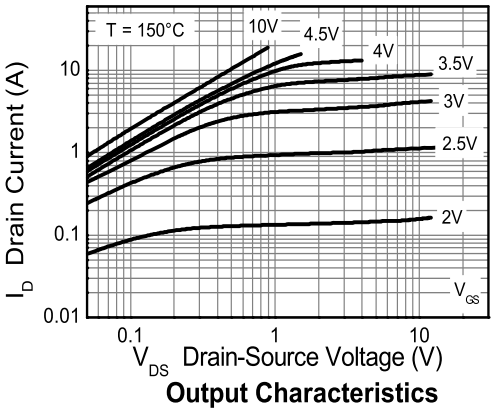
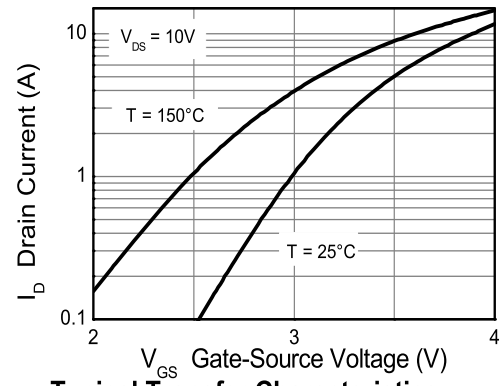
Typical characteristics



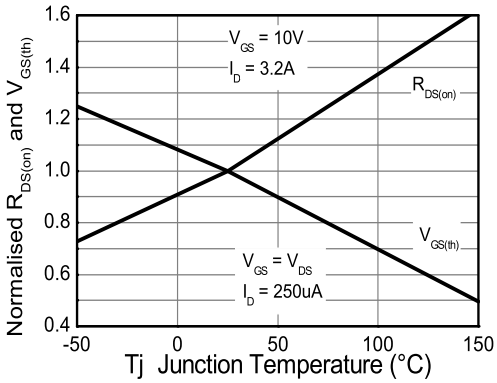
Output Characteristics



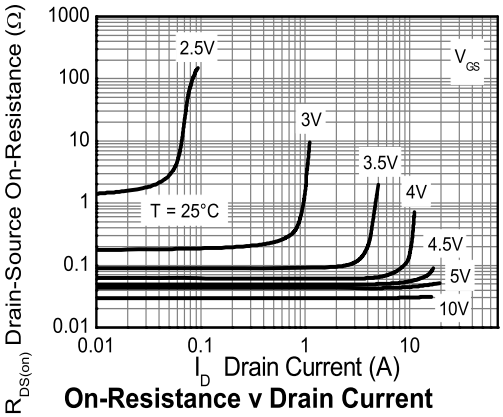
Output Characteristics



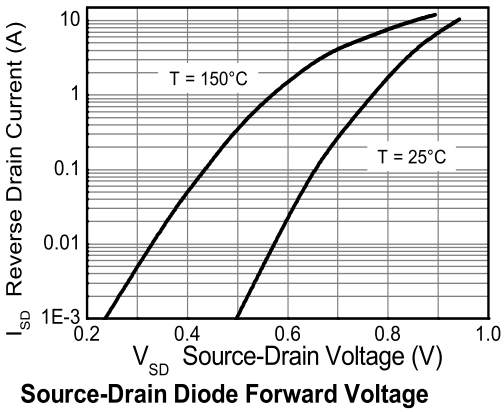
Typical Transfer Characteristics



Normalised Curves v Temperature



On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

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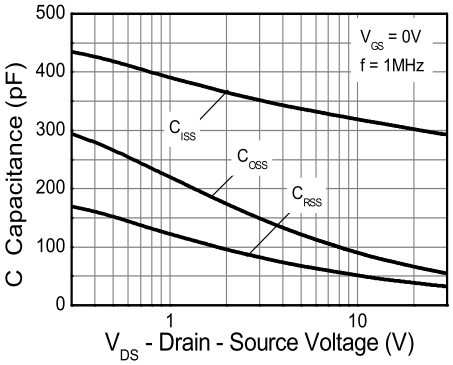
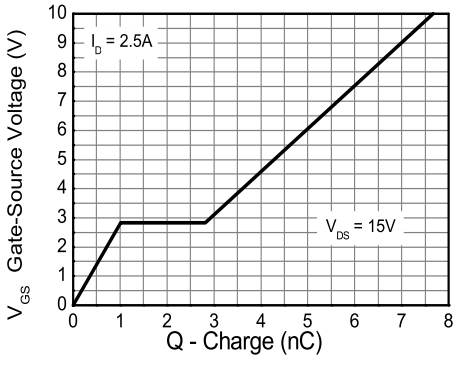
Typical characteristics

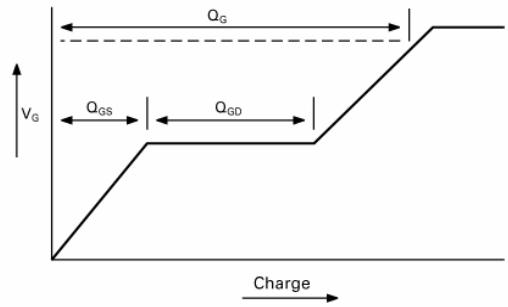


Capacitance v Drain-Source Voltage

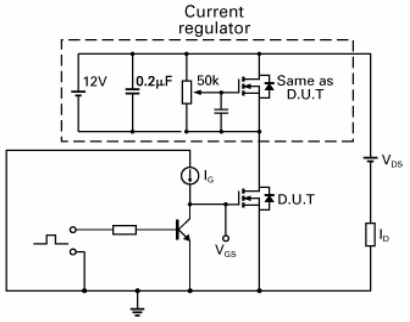


Gate-Source Voltage v Gate Charge

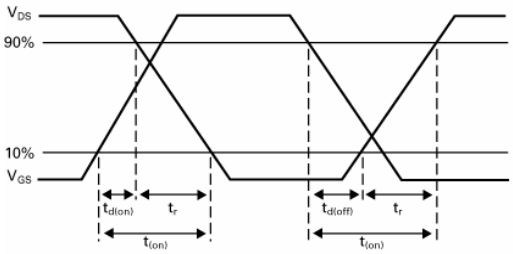
Test circuits



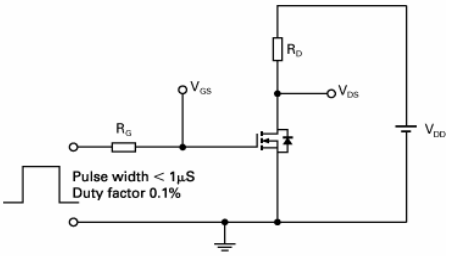
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



Switching time test circuit

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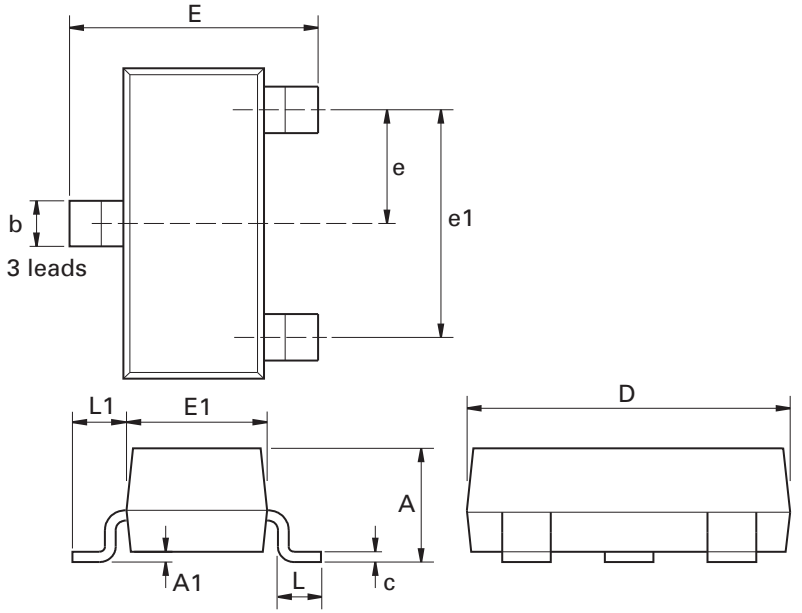
Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

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

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