

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

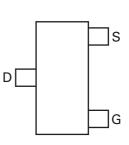
- DC-DC Converters
- Power management functions
- Motor Control

Ordering information

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

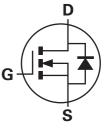
Device marking

KNA



Top view





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)	I _D	4.6	А
@ V _{GS} =4.5; T _A =70°C ^(b)		3.7	А
@ V _{GS} =4.5; T _A =25°C ^(a)		3.8	А
Pulsed drain current ^(c)	I _{DM}	21	А
Continuous source current (body diode) ^(b)	۱ _S	2.2	А
Pulsed source current (body diode) ^(c)	I _{SM}	21	А
Power dissipation at $T_A = 25^{\circ}C^{(a)}$	PD	0.95	W
Linear derating factor		7.6	mW/°C
Power dissipation at $T_A = 25^{\circ}C^{(b)}$	PD	1.4	W
Linear derating factor		11.2	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 _{⊖JL}	68	°C/W

NOTES:

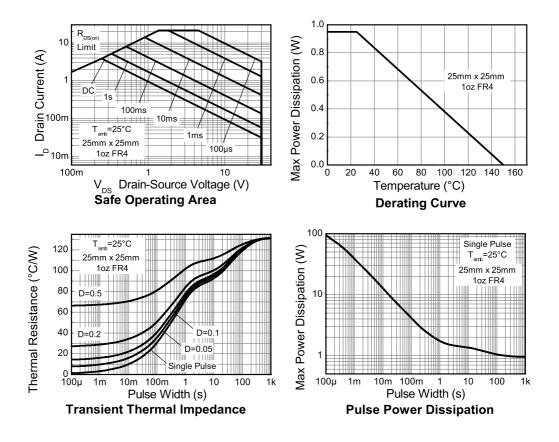
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ 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).

Thermal characteristics



Parameter	Symbol	Min.	Тур.	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	$V_{GS}=\pm 20V, V_{DS}=0V$	
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 ^{(*)(†)}	9 _{fs}		5.2		S	V _{DS} = 15V, I _D = 2.5A	
Dynamic ^(†)							
Input capacitance	C _{iss}		318		pF		
Output capacitance	C _{oss}		75		pF	V _{DS} = 15V, V _{GS} =0V f=1MHz	
Reverse transfer capacitance	C _{rss}		45		pF		
Switching ^{(†) (‡)}							
Turn-on-delay time	t _{d(on)}		1.6		ns		
Rise time	t _r		2.6		ns	V _{DD} = 15V, V _{GS} = 10V I _D = 1A	
Turn-off delay time	t _{d(off)}		17		ns	$R_G \approx 6.0\Omega$	
Fall time	t _f		9.3		ns		
Total gatecharge	Qg		7.7		nC	V _{DS} = 15V, V _{GS} = 10V	
Gate-Source charge	Q _{gs}		1		nC	I _D = 2.5A	
Gate-Drain charge	Q _{gd}		1.8		nC	1	
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	
Reverse recovery charge ^(†)	Q _{rr}		4.8		nC	di/dt=100A/µs	

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

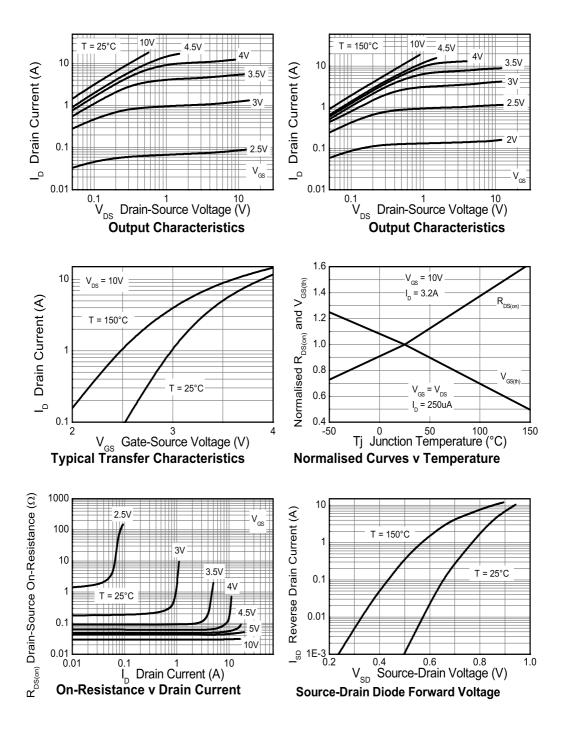
NOTES:

(*) Measured under pulsed conditions. Pulse width \leq 300 μs ; duty cycle $\leq\!\!2\%$.

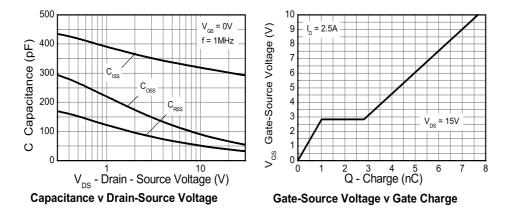
(†) For design aid only, not subject to production testing.

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

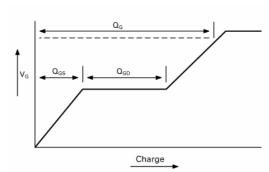
Typical characteristics



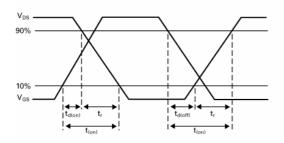
Typical characteristics



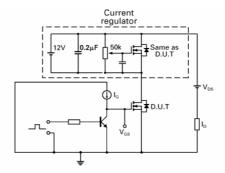
Test circuits



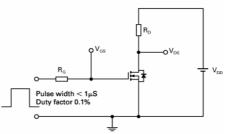
Basic gate charge waveform



Switching time waveforms

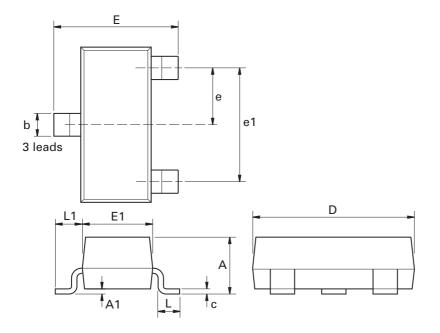


Gate charge test circuit



Switching time test circuit

Package outline - SOT23



Dim.	Millin	neters	Inc	hes	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
С	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
е	0.95	NOM	0.037	NOM	-	-	-	-	-

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

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