

ZXMN2F30FH 20V SOT23 N-channel enhancement mode MOSFET

Summary

V _{(BR)DSS}	$R_{DS(on)}\left(\Omega\right)$	I _D (A)
20	0.045 @ V _{GS} = 4.5V	4.9
	0.065 @ V _{GS} = 2.5V	4.1

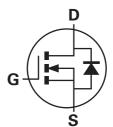


Description

This new generation Trench MOSFET from Zetex features low onresistance achievable with low (2.5V) gate drive.

Features

- · Low on-resistance
- · 2.5V gate drive capability
- SOT23 package

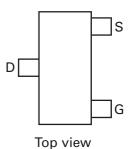


Applications

- Buck/Boost DC-DC Converters
- · Load switching and SMPS
- · Charging applications in portable equipment
- Motor Control
- · LED Lighting

Ordering information

DEVICE	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN2F30FHTA	7	8	3000



Device marking

KNC

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain source voltage	V_{DSS}	20	V
Gate source voltage	V _{GS}	±12	V
Continous Drain Current @ V _{GS} =4.5; T _A =25°C ^(b)	I _D	4.9	Α
@ V _{GS} =4.5; T _A =70°C ^(b)		4.0	Α
@ V _{GS} =4.5; T _A =25°C ^(a)		4.1	Α
Pulsed drain current ^(c)	I _{DM}	22.6	Α
Continuous source current (body diode)(b)	I _S	1.6	Α
Pulsed source current (body diode)(c)	I _{SM}	22.6	Α
Power dissipation at T _A =25°C ^(a)	P _D	0.96	W
Linear derating factor		7.6	mW/°C
Power dissipation at T _A =25°C ^(b)	P_{D}	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)	$R_{\Theta JL}$	68	°C/W

NOTES

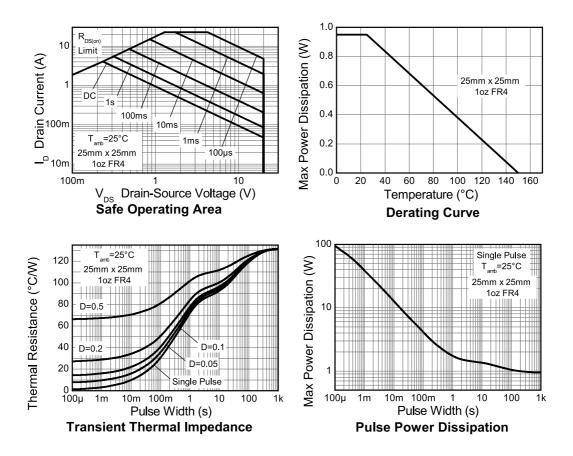
⁽a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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

⁽c) Repetitive rating - $25mm \times 25mm \text{ FR4 PCB}$, D=0.02, pulse width $300\mu\text{s}$ - pulse width limited by maximum junction temperature.

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

Thermal characteristics



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

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions	
Static			•	•			
Drain-Source Breakdown Voltage	V _{(BR)DSS}	20			V	I _D = 250μA, V _{GS} =0V	
Zero Gate Voltage Drain Current	I _{DSS}			1	μΑ	V _{DS} = 20V, V _{GS} =0V	
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±12V, V _{DS} =0V	
Gate-Source Threshold Voltage	V _{GS(th)}	0.6	0.9	1.5	V	$I_D=250\mu A, V_{DS}=V_{GS}$	
Static Drain-Source On-State Resistance (*)	R _{DS(on)}			0.045 0.065	Ω Ω	V _{GS} = 4.5V, I _D = 2.5A V _{GS} = 2.5V, I _D = 2.0A	
Forward Transconductance ^{(*)(†)}	9 _{fs}		8.6		S	V _{DS} = 10V, I _D = 3A	
Dynamic (†)							
Input Capacitance	C _{iss}		452		pF		
Output Capacitance	C _{oss}		102		pF	V _{DS} = 10V, V _{GS} =0V f=1MHz	
Reverse Transfer Capacitance	C _{rss}		58		pF	- 1- 11/11/2	
Switching (‡)(†)							
Turn-On-Delay Time	t _{d(on)}		2.9		ns		
Rise Time	t _r		5.6		ns	V _{DD} = 10V, V _{GS} = 4.5V I _D = 1A	
Turn-Off Delay Time	t _{d(off)}		19.4		ns	$R_{\rm G} \approx 6.0\Omega$	
Fall Time	t _f		10.2		ns	_	
Total Gate Charge	Q_g		4.8		nC	V _{DS} = 10V, V _{GS} = 4.5V	
Gate-Source Charge	Q _{gs}		1		nC	I _D = 3.5A	
Gate Drain Charge	Q_{gd}		1.2		nC	-	
Source-drain diode			I	1	1		
Diode Forward Voltage(*)	V_{SD}		0.75	1.2	V	I _S = 1.25A, V _{GS} =0V	

NOTES

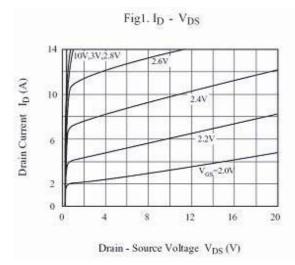
^(*) Measured under pulsed conditions. Pulse width $\leq 300 \mu s;$ duty cycle $\leq\!\!2\%.$

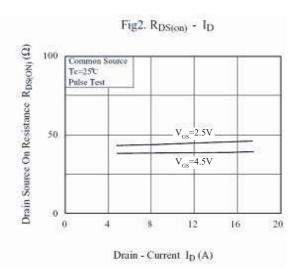
^(†) For design aid only, not subject to production testing.

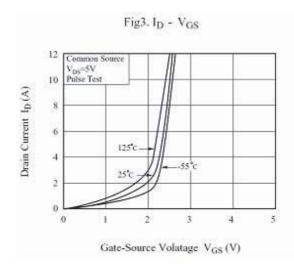
^(‡) Switching characteristics are independent of operating junction temperature.

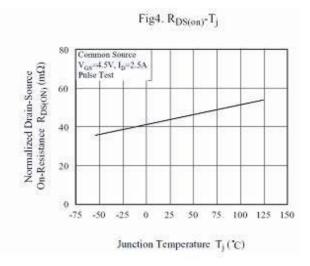
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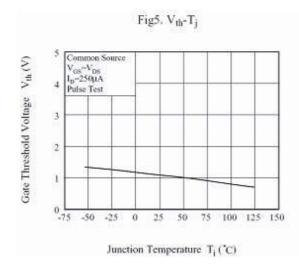
Typical characteristics

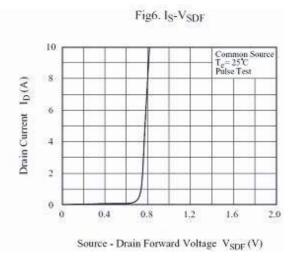






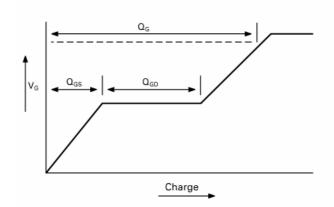






ZXMN2F30FH

Test circuits



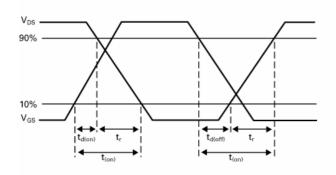
Current regulator

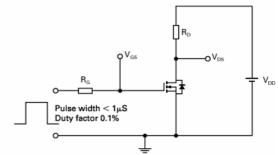
12V 0.2µF 50k D.U.T

Vos

Basic gate charge waveform

Gate charge test circuit



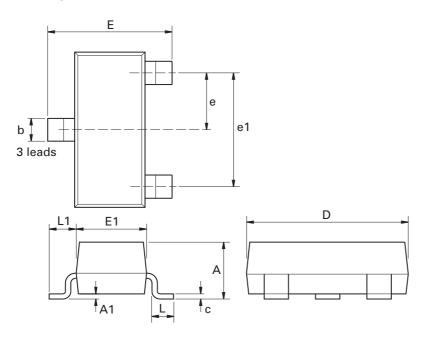


Switching time waveforms

Switching time test circuit

ZXMN2F30FH

Package outline - SOT23



Dim.	Millin	neters	Inc	hes	Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
Α	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	Е	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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