ZXMP3F30FH

30V SOT23 P-CHANNEL ENHANCEMENT MODE MOSFET

Summary

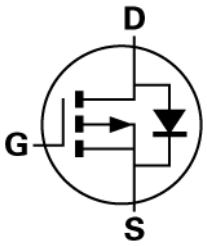
$V_{(BR)DSS}$ (V)	$R_{DS(on)}$ (Ω)	I_D (A)
-30	0.080 @ V_{GS}= -10V	-4.0
	0.140 @ V_{GS}= -4.5V	

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.

Features

- Low on-resistance
- Fast switching speed
- 4.5V gate drive capability
- Thermally enhanced SOT23 package

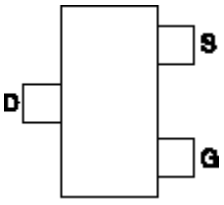


Applications

- Power management
- Portable Equipment
- Battery charging

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP3F30FHTA	7”	8mm	3,000



Pinout – top view

Device marking

KPA

Absolute Maximum Ratings

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	-3.4 -2.7 -2.8 -4.0	V
Pulsed Drain current (c)	I_{DM}	-15.3	A
Continuous Source current (Body diode) (b)	I_S	-2	A
Pulsed Source current (Body diode) (c)	I_{SM}	-15.3	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
Power dissipation at T_L =25°C (d) Linear derating factor	P_D	1.96 15.7	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)	$R_{\theta JA}$	131	°C/W
Junction to ambient (b)	$R_{\theta JA}$	89	°C/W
Junction to lead (d)	$R_{\theta JL}$	63.77	°C/W

NOTES:

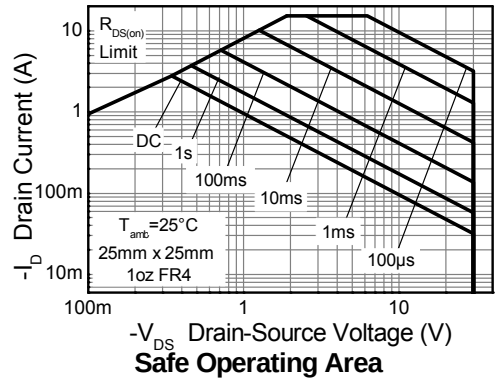
(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) Mounted on FR4 PCB measured at t ≤ 10 sec.

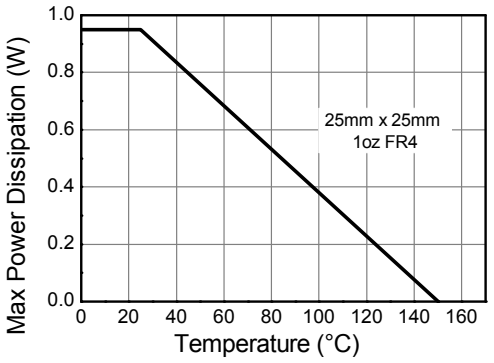
(c) Repetitive rating on 25mm x 25mm FR4 PCB, D=0.02, pulse width 300us – pulse width limited by maximum junction temperature.

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

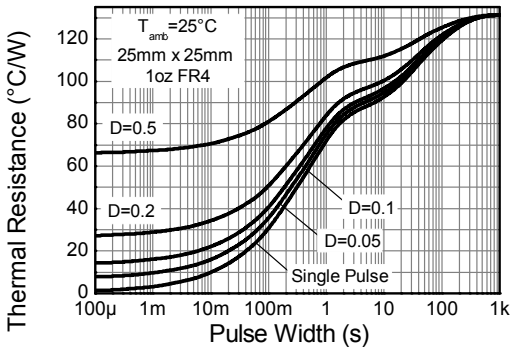
Thermal Characteristics



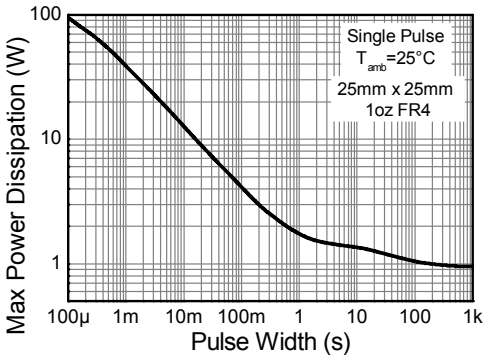
Safe Operating Area



Derating Curve



Transient Thermal Impedance



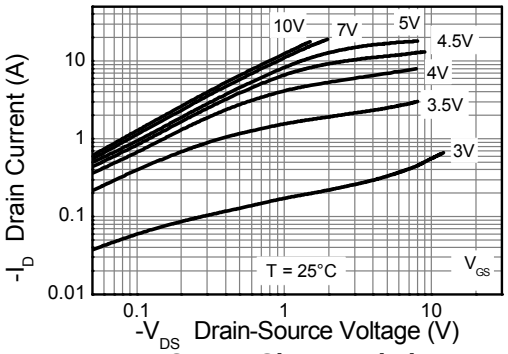
Pulse Power Dissipation

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

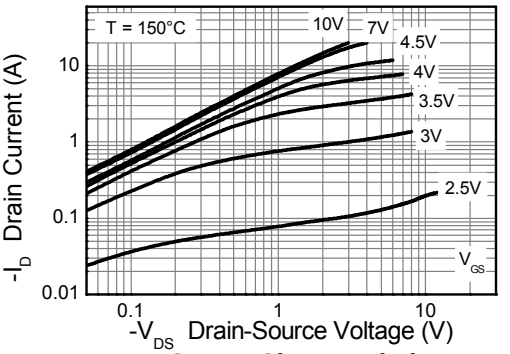
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-Source breakdown voltage	$V_{(BR)DSS}$	-30			V	I_D = -250μA, V_{GS}=0V
Zero Gate voltage Drain current	I_{DSS}			-1.0	μA	V_{DS}=-30V, V_{GS}=0V
Gate-Body leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-Source threshold voltage	$V_{GS(th)}$	-1.0			V	I_D= -250μA, V_{DS}=V_{GS}
Static Drain-Source on-state resistance (*)	$R_{DS(on)}$			0.080 0.140	Ω	V_{GS}= -10V, I_D= -2.5A V_{GS}= -4.5V, I_D= -1.9A
Forward Transconductance (*) (†)	g_{fs}		5		S	V_{DS}= -15V, I_D= -3A
Dynamic (†)						
Input capacitance	C_{iss}		370		pF	V_{DS}= -15V, V_{GS}=0V f=1MHz
Output capacitance	C_{oss}		72		pF	
Reverse transfer capacitance	C_{rss}		38		pF	
Switching (‡) (†)						
Turn-on-delay time	$t_{d(on)}$		1.3		ns	V_{DD}= -15V, V_{GS}= -10V I_D= -1A $R_G \cong 6.0\Omega$,
Rise time	t_r		2.6		ns	
Turn-off delay time	$t_{d(off)}$		49		ns	
Fall time	t_f		22		ns	
Gate charge						
Total Gate charge	Q_g		7		nC	V_{DS}= -15V, V_{GS}= -10V I_D= -3A
Gate-Source charge	Q_{gs}		1.2		nC	
Gate-Drain charge	Q_{gd}		1.3		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}		14.6		ns	I_S= -1.5A,di/dt=100A/μs
Reverse recovery charge (‡)	Q_{rr}		9.5		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

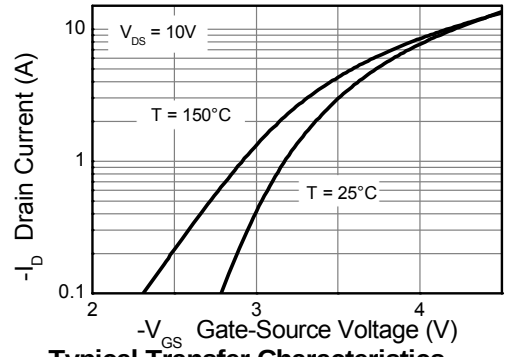
Typical Characteristics



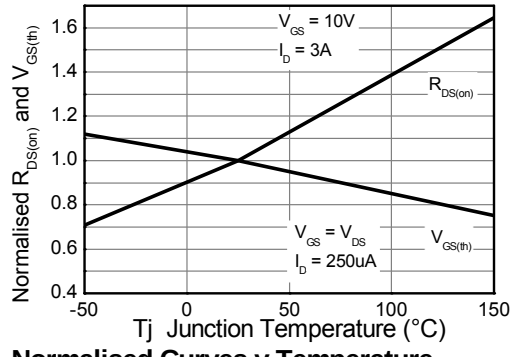
Output Characteristics



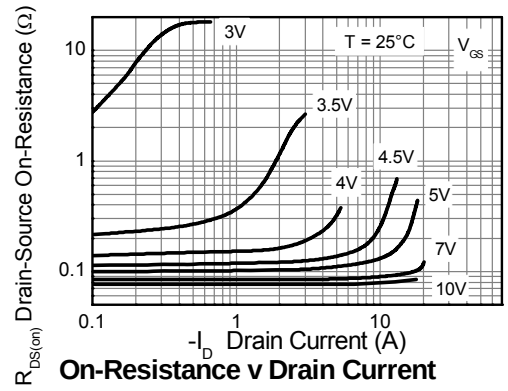
Output Characteristics



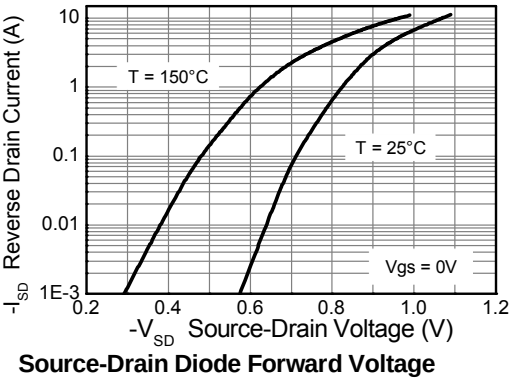
Typical Transfer Characteristics



Normalised Curves v Temperature

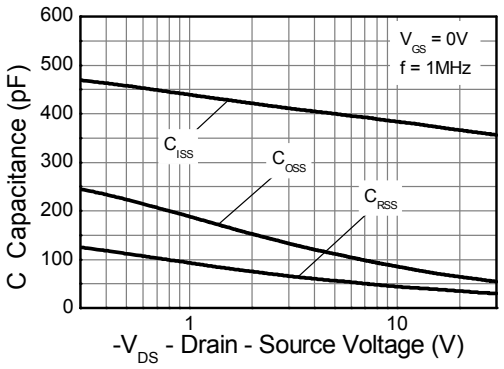


On-Resistance v Drain Current

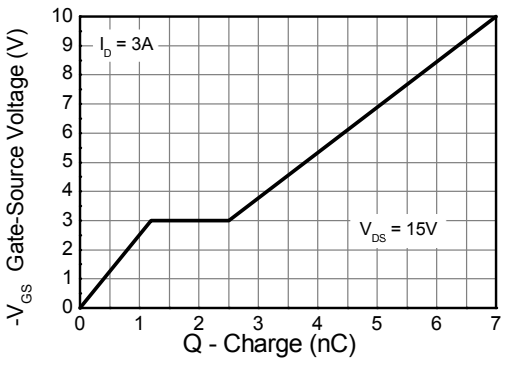


Source-Drain Diode Forward Voltage

Typical Characteristics

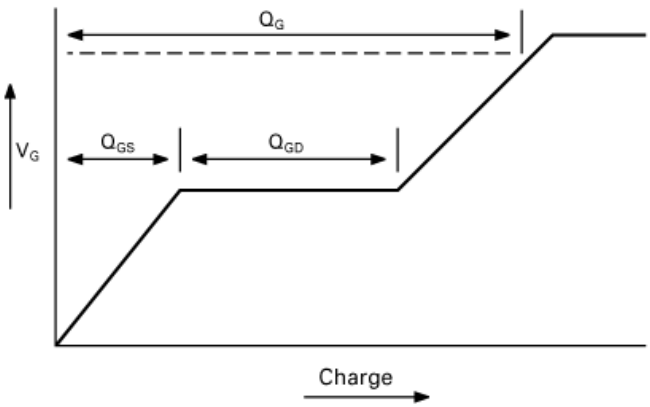


Capacitance v Drain-Source Voltage

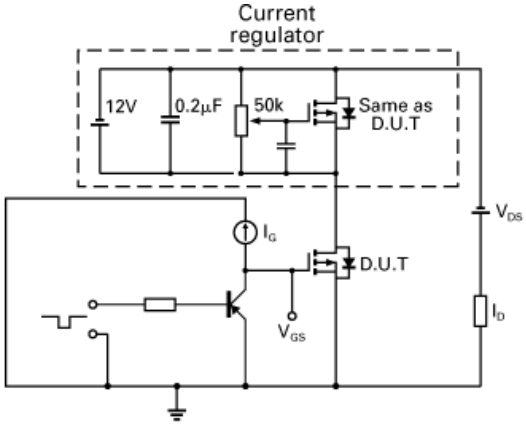


Gate-Source Voltage v Gate Charge

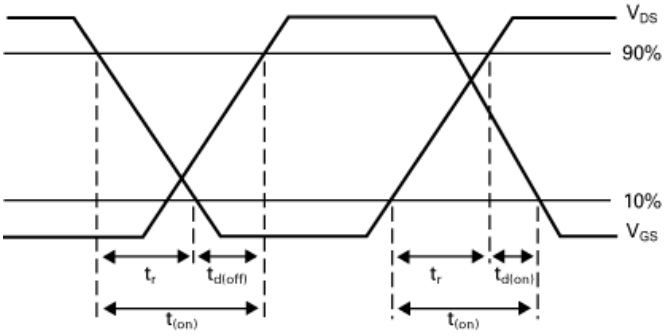
Test Circuits



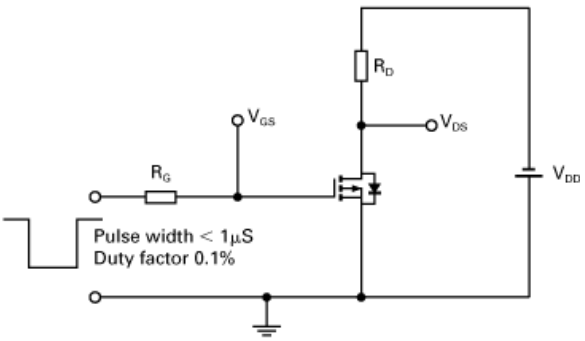
Basic gate charge waveform



Gate charge test circuit



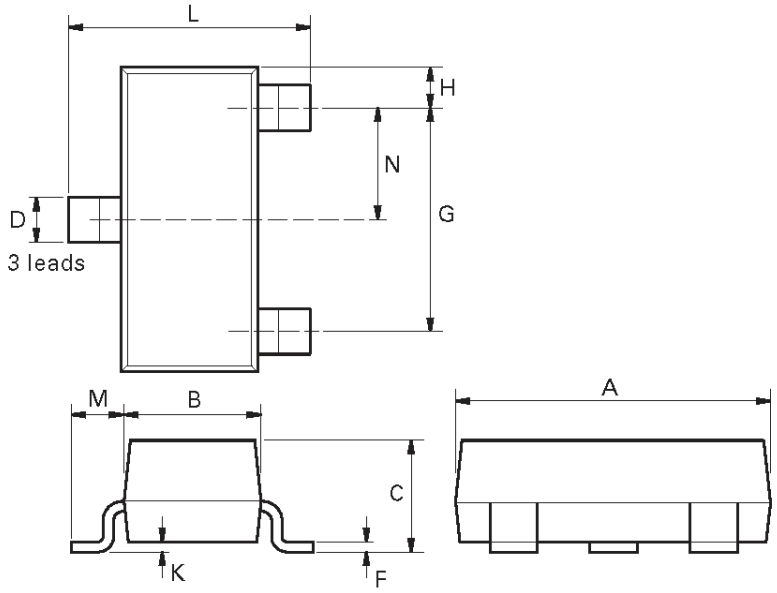
Switching time waveforms



Switching time test circuit

Packaging Details – SOT23

Package outline



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Max.	Max.
A	2.67	3.05	0.105	0.120	H	0.33	0.51	0.013	0.020
B	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
C	-	1.10	-	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90 NOM		0.075 NOM		-	-	-	-	-

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

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"Not recommended for new designs"	Device is still in production to support existing designs and production
"Obsolete"	Production has been discontinued

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