

ZXMP6A13F

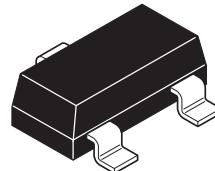
60V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -60V$; $R_{DS(ON)} = 0.400\Omega$; $I_D = -1.1A$

DESCRIPTION

This new generation of trench MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



SOT23

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

APPLICATIONS

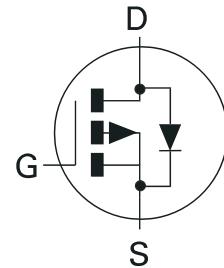
- DC - DC converters
- Power management functions
- Relay and solenoid driving
- Motor control

ORDERING INFORMATION

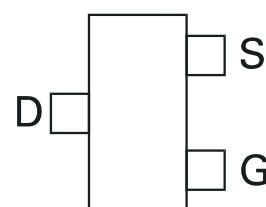
DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMP6A13FTA	7"	8mm	3000 units
ZXMP6A13FTC	13"	8mm	10000 units

DEVICE MARKING

- 7P6



PINOUT



Top View

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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	-60	V
Gate Source Voltage	V_{GS}	± 20	V
Continuous Drain Current $V_{GS}=10V$; $T_A=25^\circ C$ ^(b) $V_{GS}=10V$; $T_A=70^\circ C$ ^(b) $V_{GS}=10V$; $T_A=25^\circ C$ ^(a)	I_D	-1.1 -0.8 -0.9	A
Pulsed Drain Current ^(c)	I_{DM}	-4.0	A
Continuous Source Current (Body Diode) ^(b)	I_S	-1.2	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	-4.0	A
Power Dissipation at $T_A=25^\circ C$ ^(a) Linear Derating Factor	P_D	625 5	mW $mW/^\circ C$
Power Dissipation at $T_A=25^\circ C$ ^(b) Linear Derating Factor	P_D	806 6.5	mW $mW/^\circ C$
Operating and Storage Temperature Range	$T_j:T_{stg}$	-55 to +150	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient ^(a)	$R_{\theta JA}$	200	°C/W
Junction to Ambient ^(b)	$R_{\theta JA}$	155	°C/W

NOTES

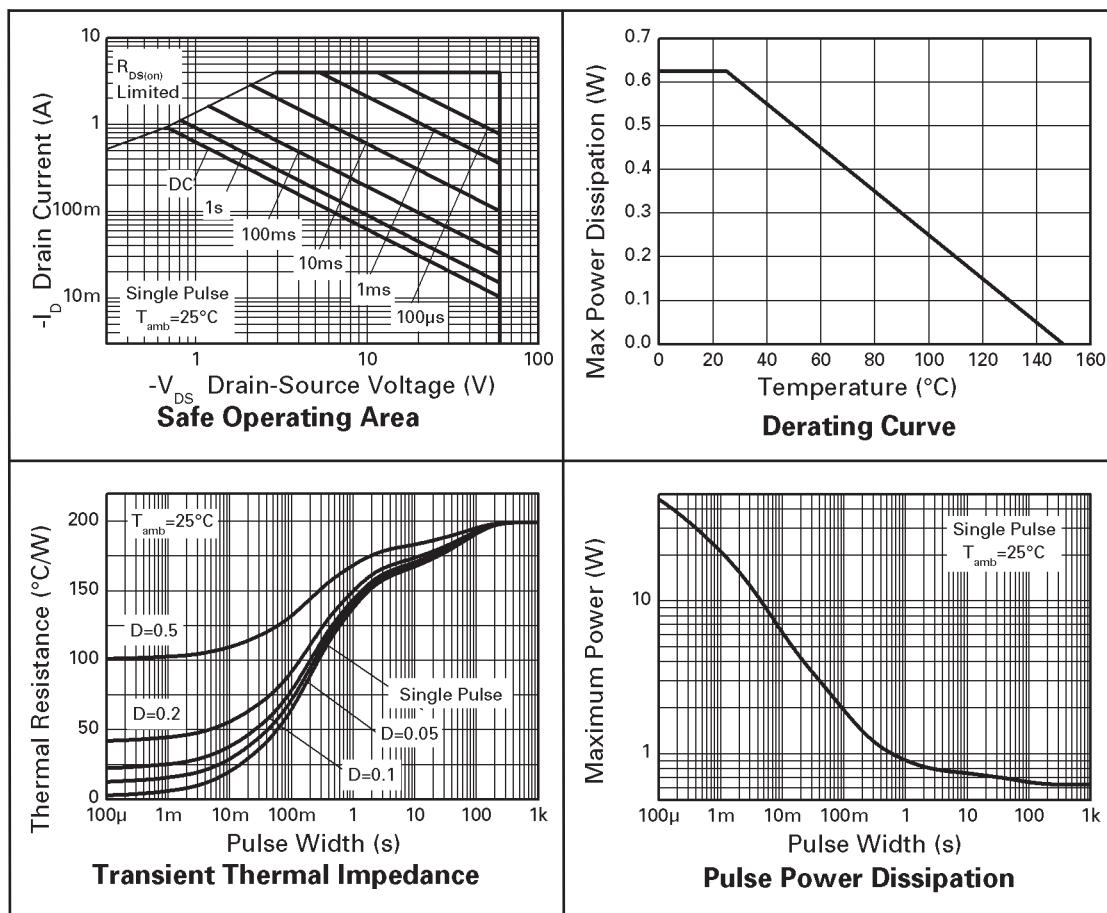
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

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

(c) Repetitive rating 25mm x 25mm FR4 PCB, $D=0.05$ pulse width=10μs - pulse width limited by maximum junction temperature.

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CHARACTERISTICS



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ELECTRICAL CHARACTERISTICS (at $T_A = 25^\circ\text{C}$ unless otherwise stated)

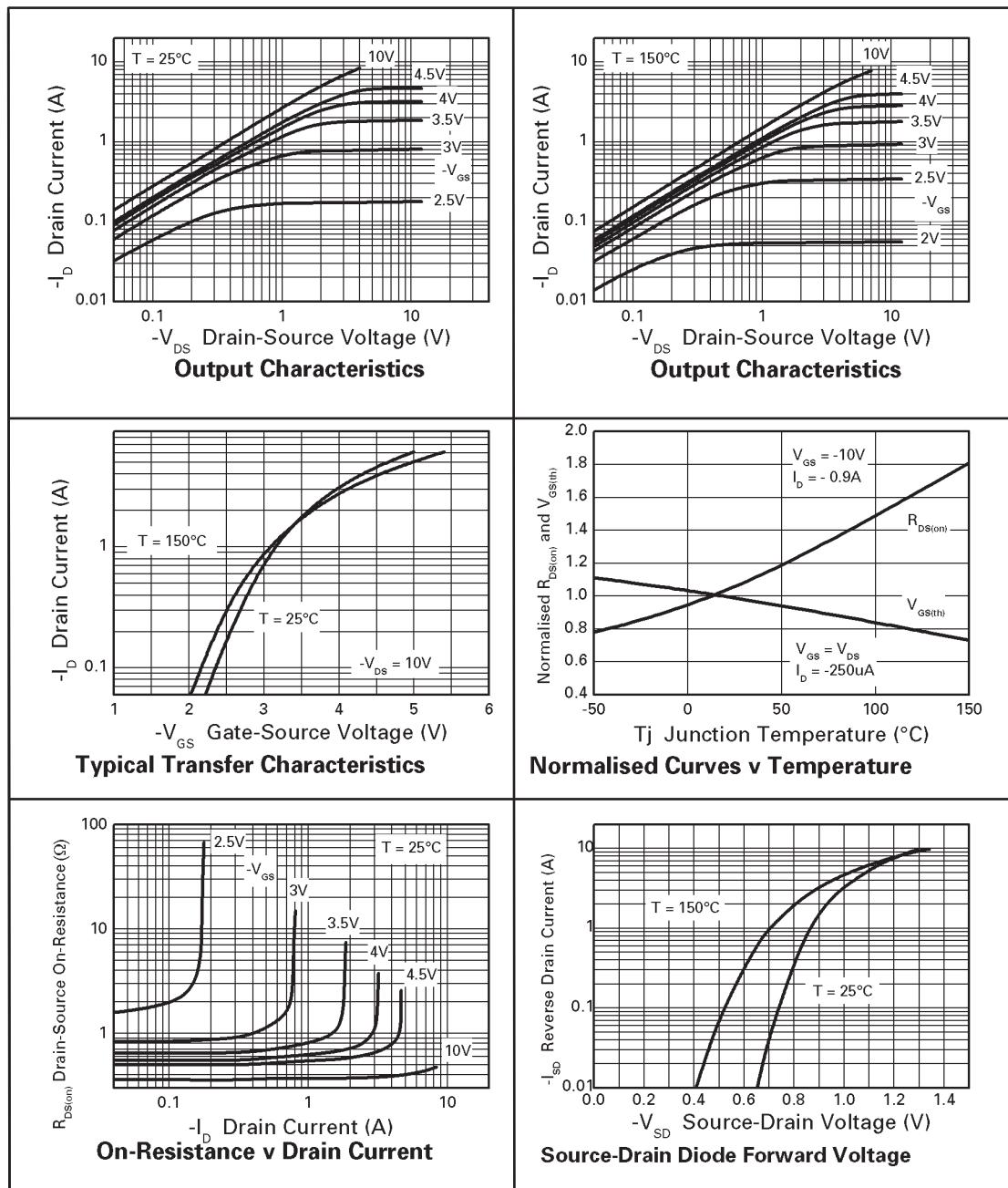
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	-60			V	$I_D=-250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-1	μA	$V_{DS}=-60\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{\text{GS}(\text{th})}$	-1.0			V	$I_D=-250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{\text{DS}(\text{on})}$			0.400 0.600	Ω	$V_{GS}=-10\text{V}, I_D=-0.9\text{A}$ $V_{GS}=-4.5\text{V}, I_D=-0.8\text{A}$
Forward Transconductance ⁽¹⁾⁽³⁾	g_{fs}		1.8		S	$V_{DS}=-15\text{V}, I_D=-0.9\text{A}$
DYNAMIC ⁽³⁾						
Input Capacitance	C_{iss}		219		pF	$V_{DS}=-30\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	C_{oss}		25.7		pF	
Reverse Transfer Capacitance	C_{rss}		20.5		pF	
SWITCHING ^{(2) (3)}						
Turn-On Delay Time	$t_{\text{d}(\text{on})}$		1.6		ns	$V_{DD}=-30\text{V}, I_D=-1\text{A}$ $R_G \geq 6.0\Omega, V_{GS}=-10\text{V}$
Rise Time	t_r		2.2		ns	
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$		11.2		ns	
Fall Time	t_f		5.7		ns	
Gate Charge	Q_g		3.2		nC	$V_{DS}=-30\text{V}, V_{GS}=-5\text{V},$ $I_D=-0.9\text{A}$
Total Gate Charge	Q_g		5.9		nC	$V_{DS}=-30\text{V}, V_{GS}=-10\text{V},$ $I_D=-0.9\text{A}$
Gate-Source Charge	Q_{gs}		0.74		nC	
Gate-Drain Charge	Q_{gd}		1.5		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage ⁽¹⁾	V_{SD}		-0.85	-0.95	V	$T_J=25^\circ\text{C}, I_S=-0.8\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time ⁽³⁾	t_{rr}		21.1		ns	$T_J=25^\circ\text{C}, I_F=-0.9\text{A},$ $di/dt= 100\text{A}/\mu\text{s}$
Reverse Recovery Charge ⁽³⁾	Q_{rr}		19.3		nC	

NOTES:

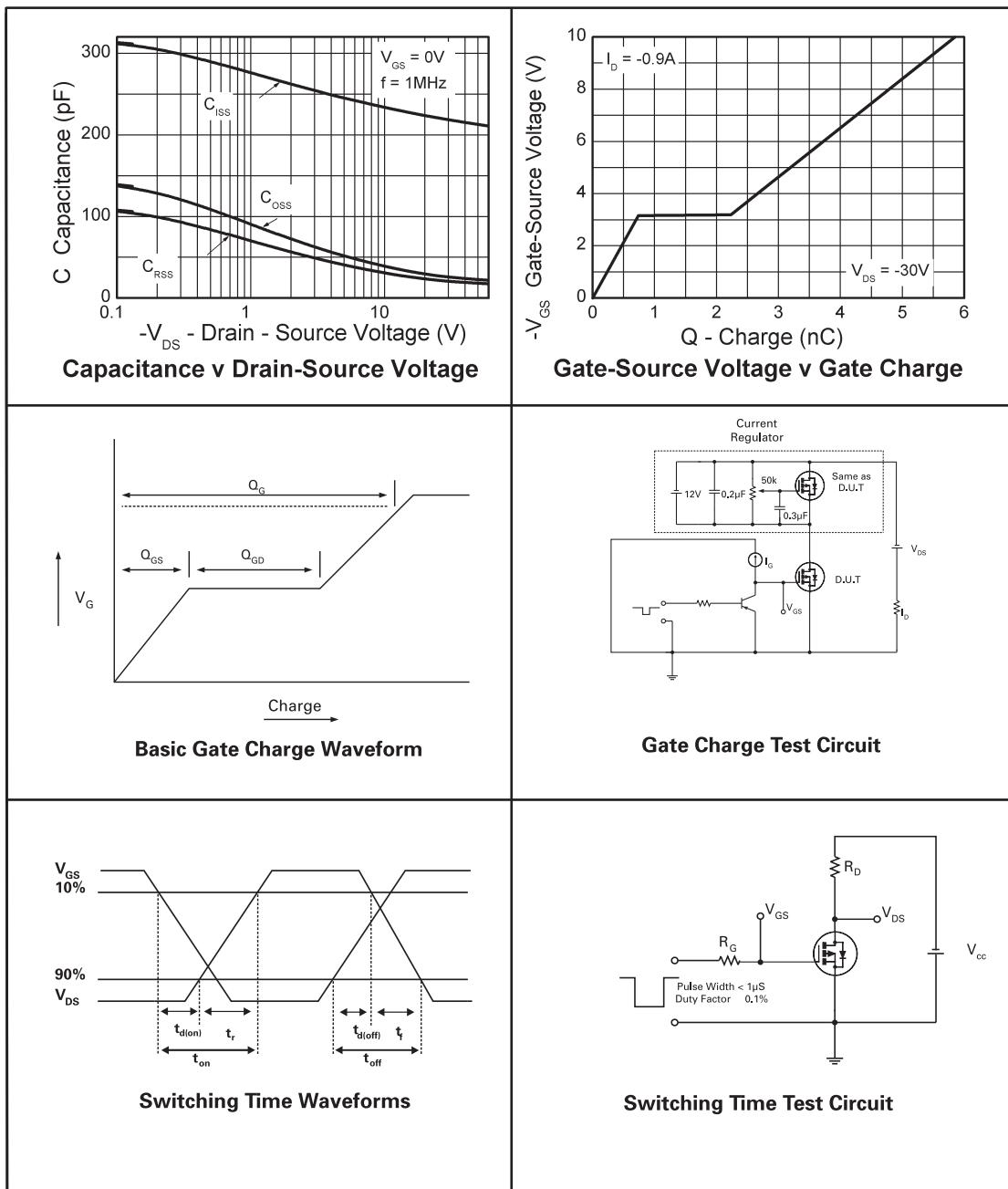
- (1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

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TYPICAL CHARACTERISTICS



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"Active" Product status recommended for new designs

"Last time buy (LTB)" Device will be discontinued and last time buy period and delivery is in effect

"Not recommended for new designs" Device is still in production to support existing designs and production

"Obsolete" Production has been discontinued

Datasheet status key:

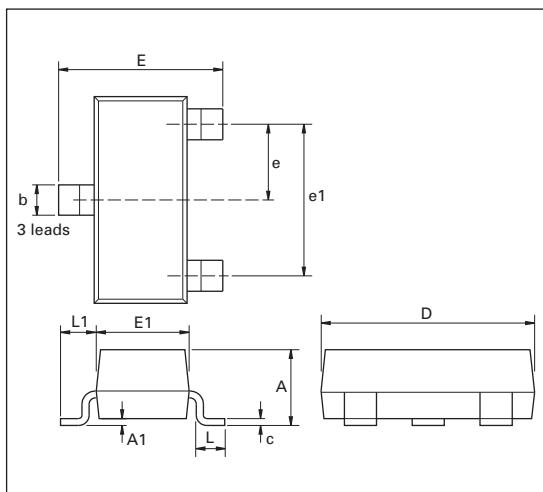
"Draft version" This term denotes a very early datasheet version and contains highly provisional information, which may change in any manner without notice.

"Provisional version" This term denotes a pre-release datasheet. It provides a clear indication of anticipated performance. However, changes to the test conditions and specifications may occur, at any time and without notice.

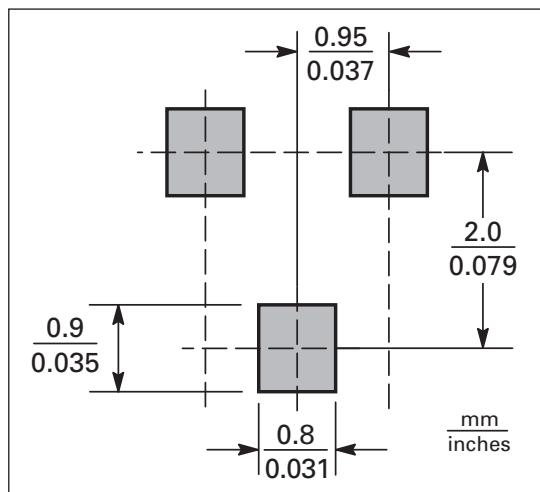
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PACKAGE OUTLINE



PAD LAYOUT



PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Max	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	0.018	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		—	—	—	—	—

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