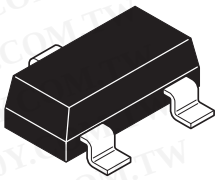
ZXMP6A13F

60V P-CHANNEL ENHANCEMENT MODE MOSFET

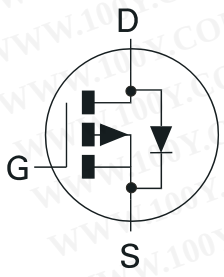
SUMMARY
$V_{(BR)DSS}$ = -60V; $R_{DS(ON)}$ = 0.400Ω; I_D =-1.1A

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

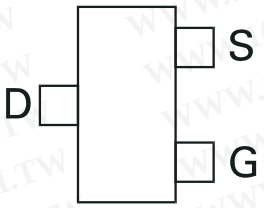


APPLICATIONS
- DC - DC converters
- Power management functions
- Relay and solenoid driving
- Motor control

ORDERING INFORMATION

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

PINOUT



Top View

DEVICE MARKING
- 7P6

ABSOLUTE MAXIMUM RATINGS.

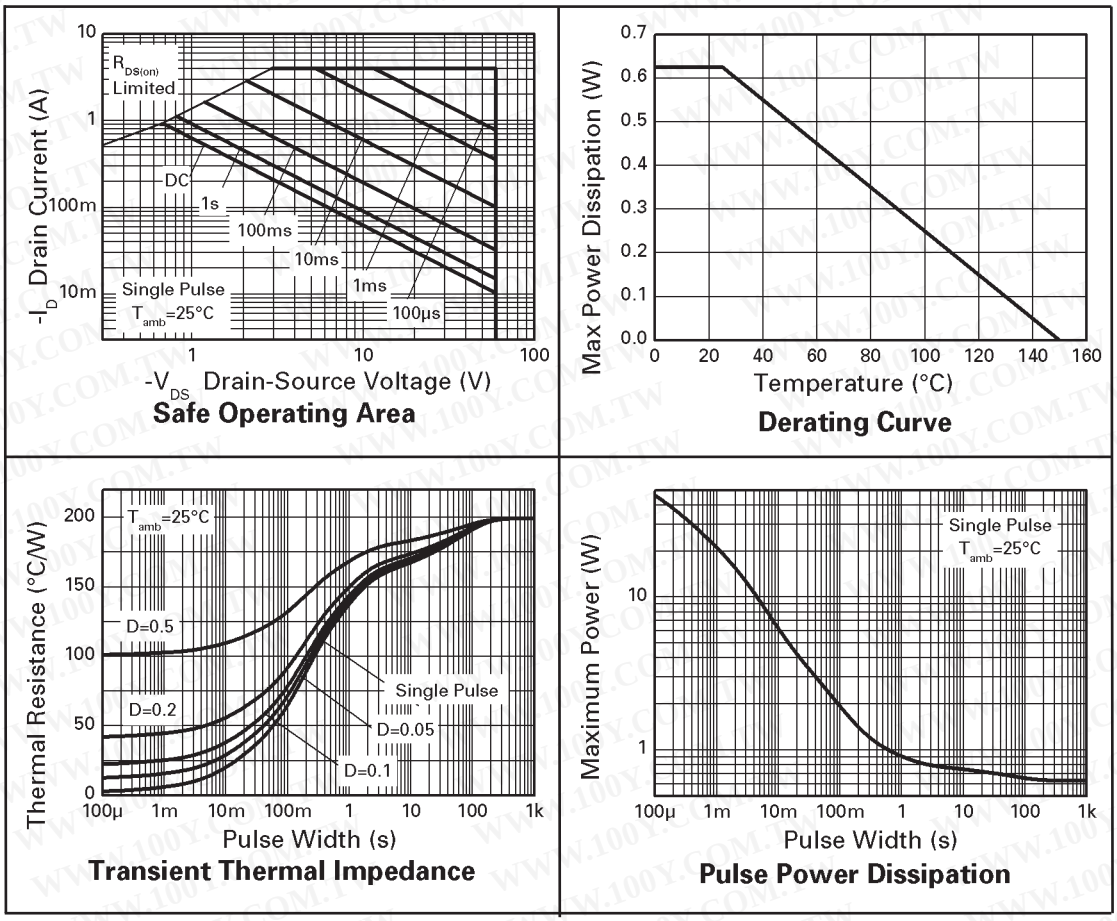
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	-60	V
Gate Source Voltage	V_{GS}	±20	V
Continuous Drain Current V_{GS}=10V; T_A=25°C (b) V_{GS}=10V; T_A=70°C (b) V_{GS}=10V; T_A=25°C (a)	I_D	-1.1 -0.8 -0.9	A
Pulsed Drain Current (c)	I_{DM}	-4.0	A
Continuous Source Current (Body Diode) (b)	I_S	-1.2	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	-4.0	A
Power Dissipation at T_A=25°C (a) Linear Derating Factor	P_D	625 5	mW mW/°C
Power Dissipation at T_A=25°C (b) Linear Derating Factor	P_D	806 6.5	mW 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)	$R_{\theta JA}$	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 ≤5 secs.
(c) Repetitive rating 25mm x 25mm FR4 PCB, D=0.05 pulse width=10µs - pulse width limited by maximum junction temperature.

CHARACTERISTICS



ZXMP6A13F

ELECTRICAL CHARACTERISTICS (at T_A = 25°C unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-60			V	I_D=-250μA, V_{GS}=0V
Zero Gate Voltage Drain Current	I_{DSS}			-1	μA	V_{DS}=-60V, 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 (1)	$R_{DS(on)}$			0.400 0.600	Ω Ω	V_{GS}=-10V, I_D=-0.9A V_{GS}=-4.5V, I_D=-0.8A
Forward Transconductance (1)(3)	g_{fs}		1.8		S	V_{DS}=-15V,I_D=-0.9A
DYNAMIC (3)						
Input Capacitance	C_{iss}		219		pF	V_{DS}=-30V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		25.7		pF	
Reverse Transfer Capacitance	C_{rss}		20.5		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		1.6		ns	V_{DD} =-30V, I_D=-1A R_G≅6.0Ω, V_{GS}=-10V
Rise Time	t_r		2.2		ns	
Turn-Off Delay Time	$t_{d(off)}$		11.2		ns	
Fall Time	t_f		5.7		ns	
Gate Charge	Q_g		3.2		nC	V_{DS}=-30V,V_{GS}=-5V, I_D=-0.9A
Total Gate Charge	Q_g		5.9		nC	V_{DS}=-30V,V_{GS}=-10V, I_D=-0.9A
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°C, I_S=-0.8A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		21.1		ns	T_J=25°C, I_F=-0.9A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		19.3		nC	

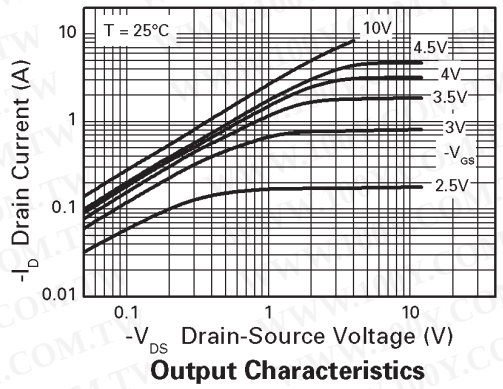
NOTES:

(1) Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2% .

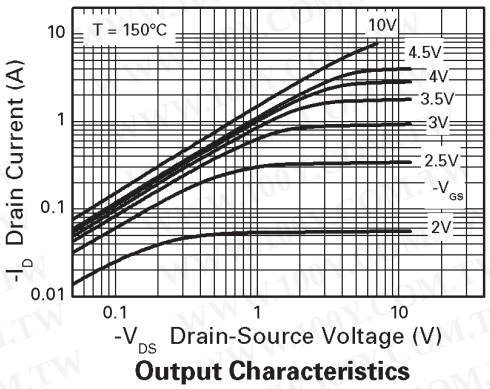
(2) Switching characteristics are independent of operating junction temperature.

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

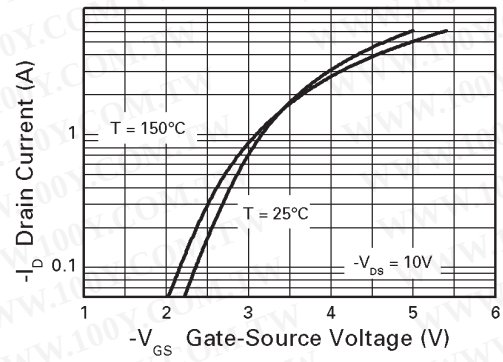
TYPICAL CHARACTERISTICS



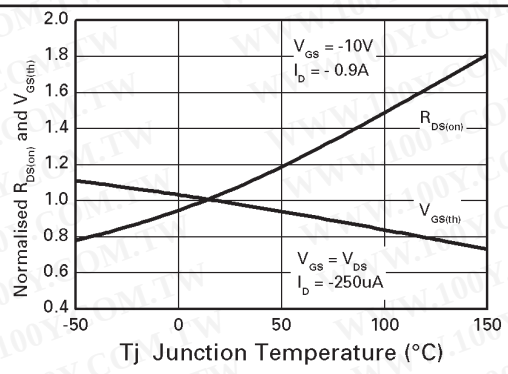
Output Characteristics



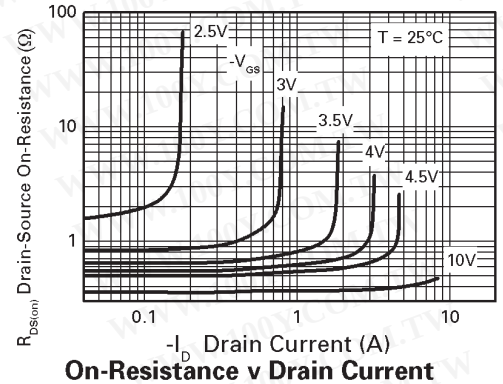
Output Characteristics



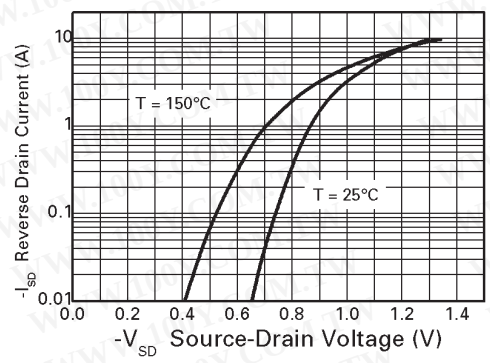
Typical Transfer Characteristics



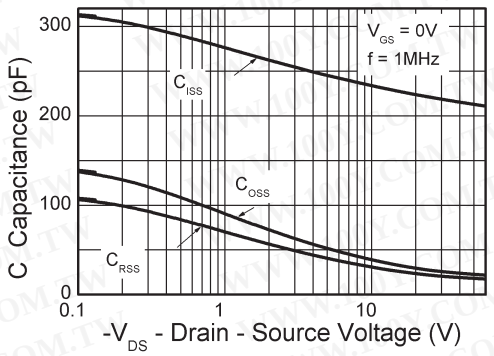
Normalised Curves v Temperature



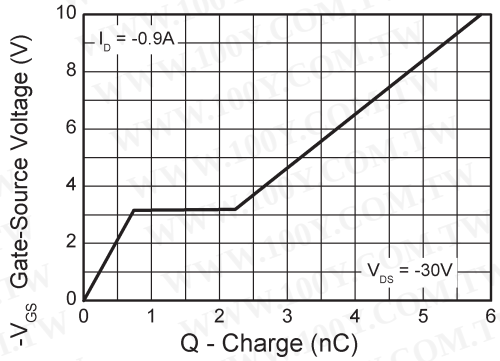
On-Resistance v Drain Current



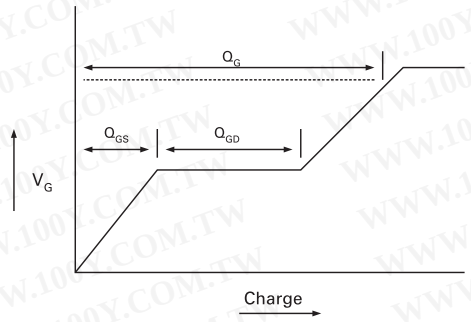
Source-Drain Diode Forward Voltage



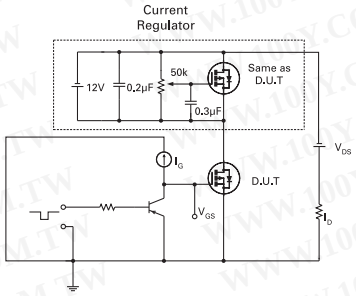
Capacitance v Drain-Source Voltage



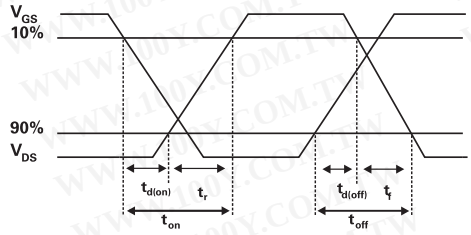
Gate-Source Voltage v Gate Charge



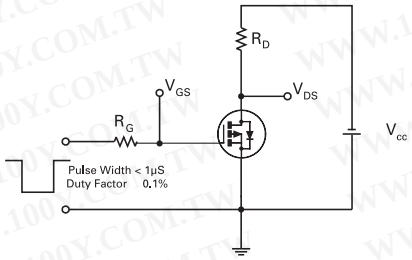
Basic Gate Charge Waveform



Gate Charge Test Circuit



Switching Time Waveforms



Switching Time Test Circuit

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Datasheet status key:
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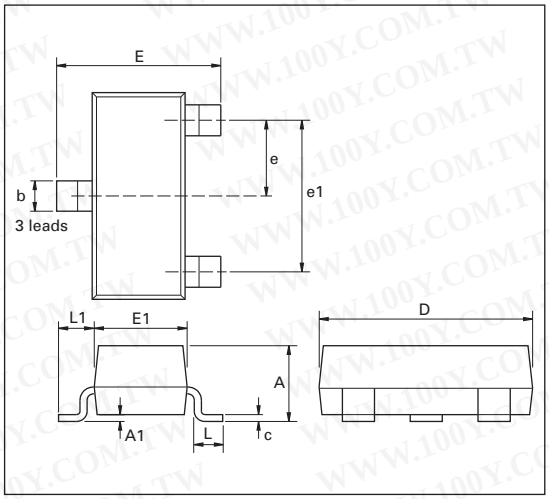
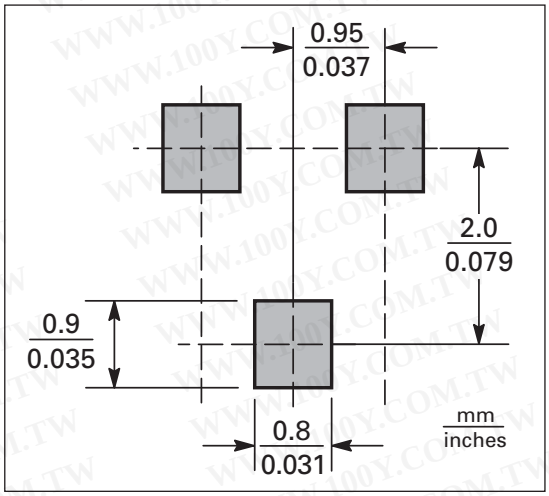
PACKAGE OUTLINE



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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