

ZXMP6A13G

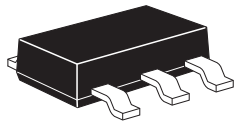
60V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -60V$; $R_{DS(on)} = 0.390\Omega$; $I_D = -2.3A$

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.



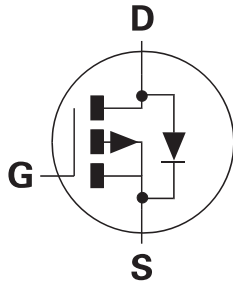
SOT223

FEATURES

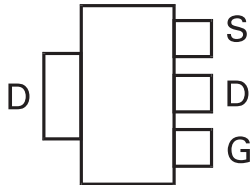
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT223 package

APPLICATIONS

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



PINOUT



Top View

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMP6A13GTA	7"	12mm	1000 units
ZXMP6A13GTC	13"	12mm	4000 units

DEVICE MARKING

- ZXMP
6A13

ZXMP6A13G

ABSOLUTE MAXIMUM RATING

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	-2.3 -1.9 -1.7	A
Pulsed Drain Current ^(c)	I_{DM}	-7.8	A
Continuous Source Current (Body Diode) ^(b)	I_S	-4.1	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	-7.8	A
Power Dissipation at $T_A = 25^\circ C$ ^(a) Linear Derating Factor	P_D	2.0 16	W mW/ $^\circ C$
Power Dissipation at $T_A = 25^\circ C$ ^(b) Linear Derating Factor	P_D	3.9 31	W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_J; T_{stg}$	-55 to +150	$^\circ C$

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient ^(a)	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to Ambient ^(b)	$R_{\theta JA}$	32.2	$^\circ C/W$

NOTES:

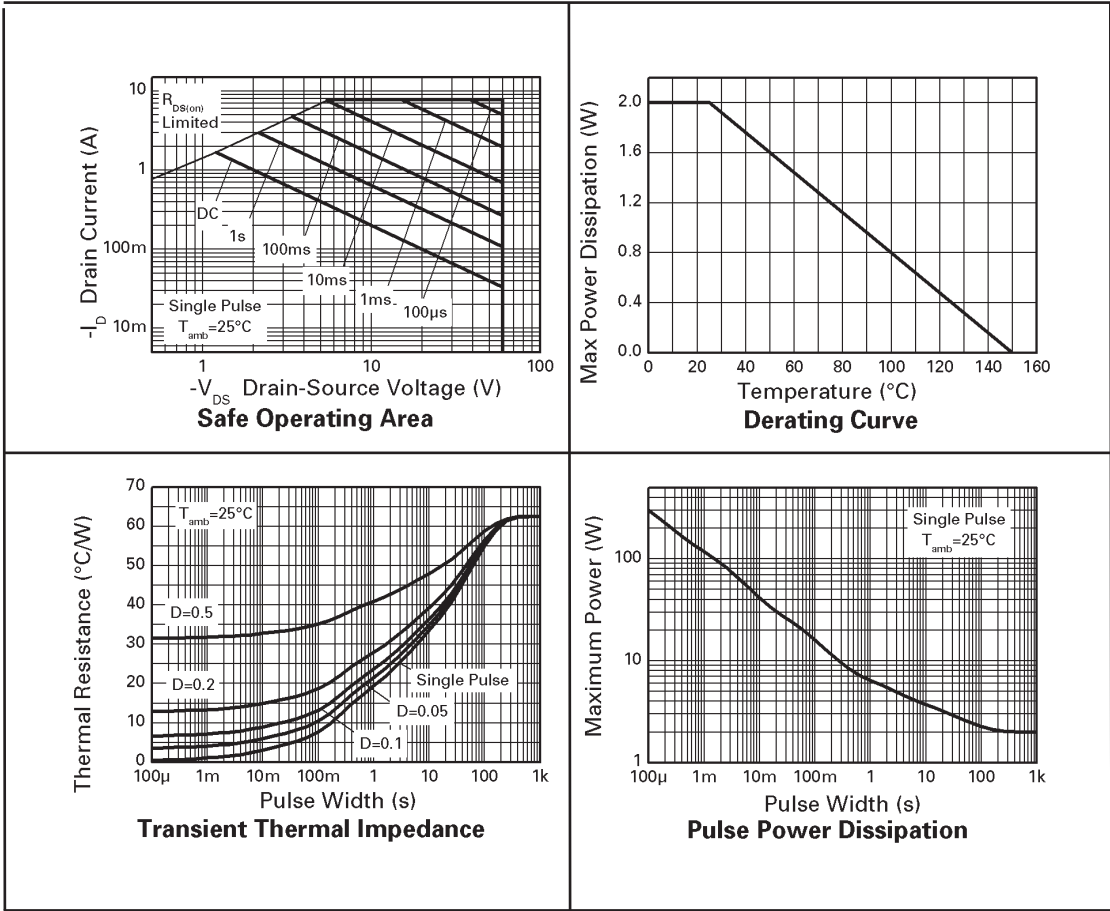
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, $D=0.05$ 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)

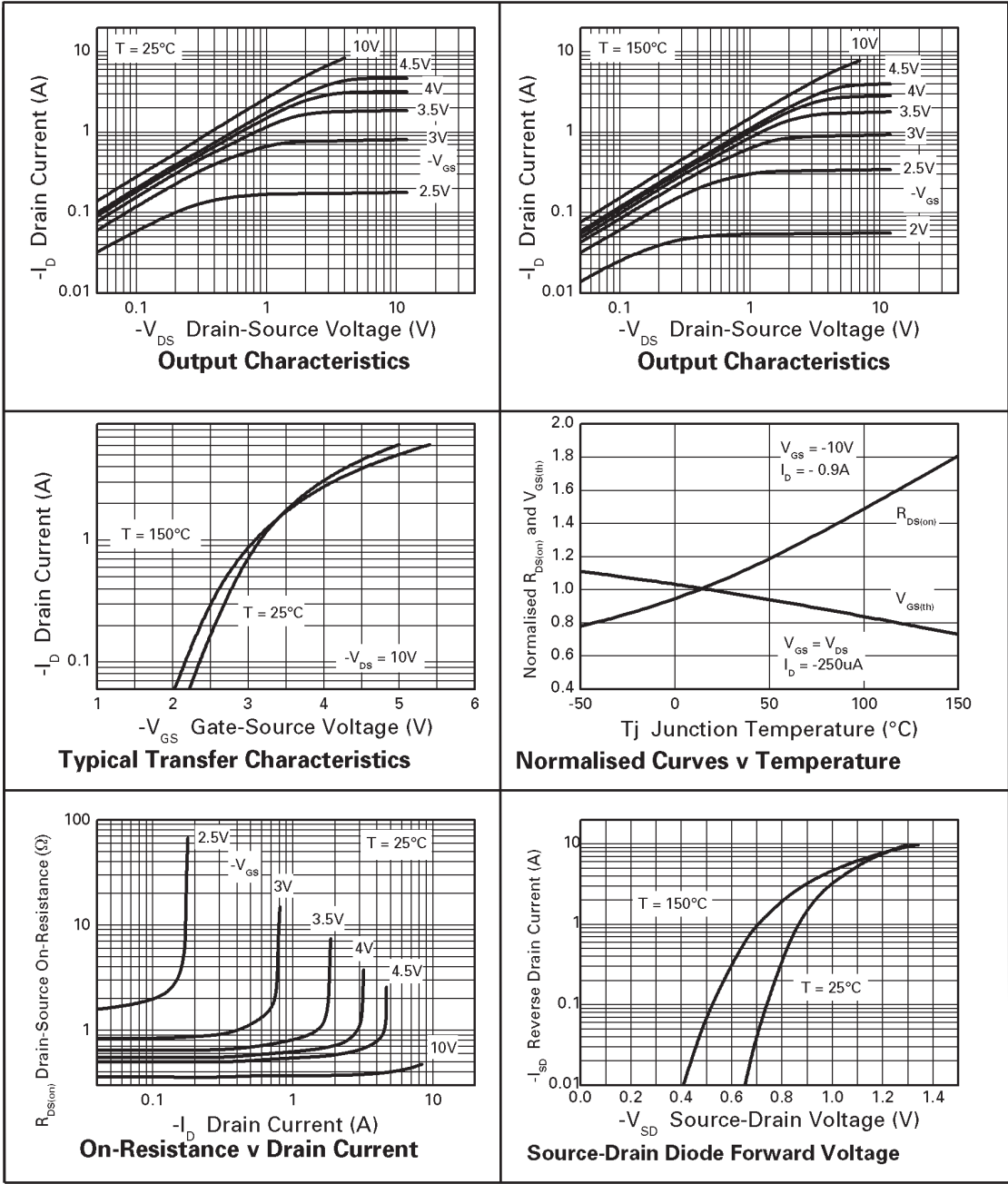
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	-60			V	I _D =-250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			-1	μA	V _{DS} =-60V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	-1.0			V	I _D =-250μA, V _{DS} = V _{GS}
Static Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}			0.390 0.595	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 $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

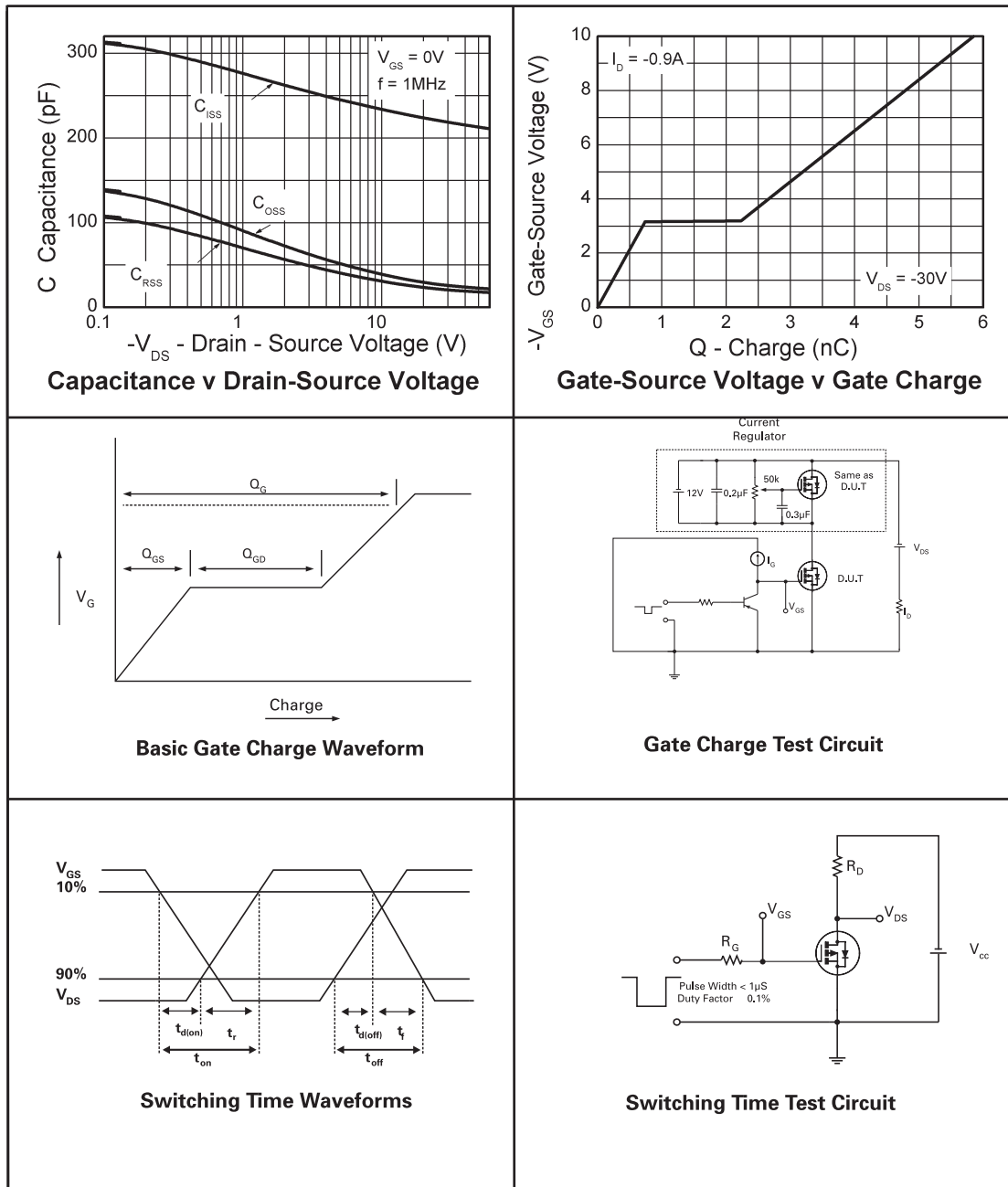
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TYPICAL CHARACTERISTICS



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TYPICAL CHARACTERISTICS



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"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:

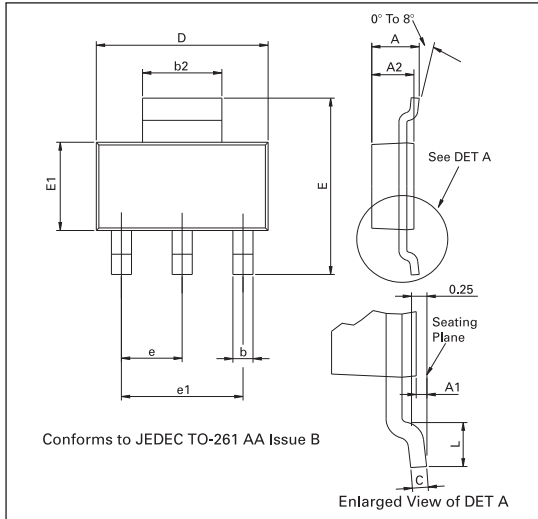
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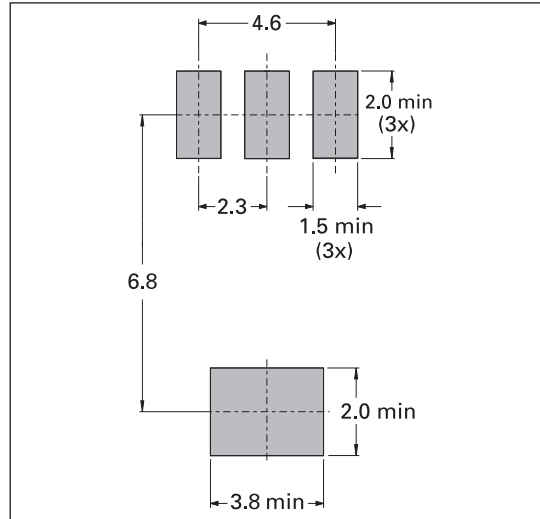
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PACKAGE OUTLINE



PAD LAYOUT DETAILS



PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	e	2.30 BSC		0.0905 BSC	
A1	0.02	0.10	0.0008	0.004	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
C	0.23	0.33	0.009	0.013	L	0.90	-	0.355	-
D	6.30	6.70	0.248	0.264	-	-	-	-	-

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ISSUE 3 - MAY 2007