

ZXMP6A13G

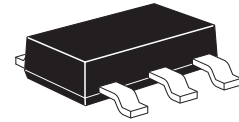
60V P-CHANNEL ENHANCEMENT MODE MOSFET

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.



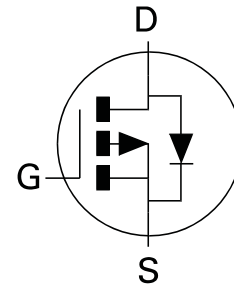
SOT223

FEATURES

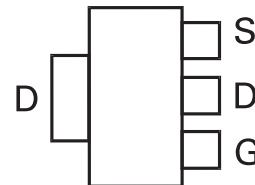
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT223 package

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

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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

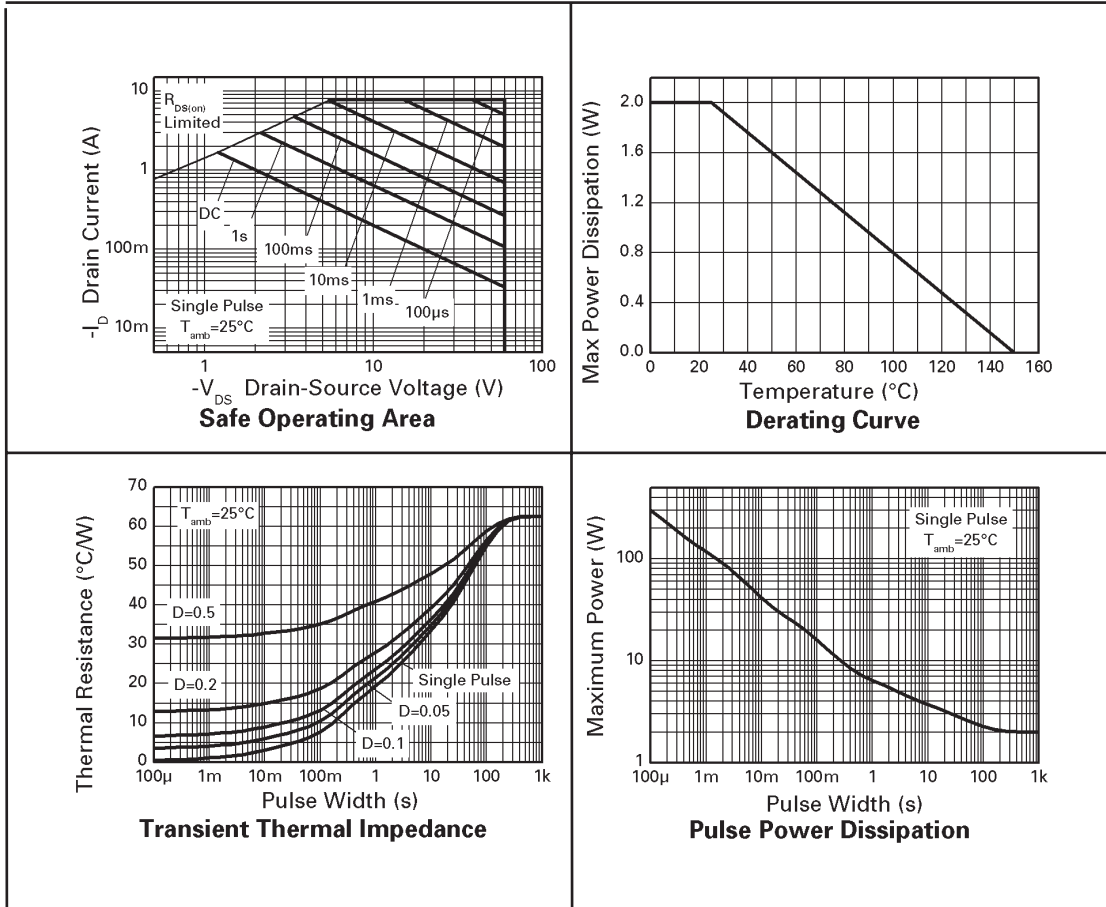
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient ^(a)	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to Ambient ^(b)	$R_{\theta JA}$	32.2	$^\circ C/W$

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)

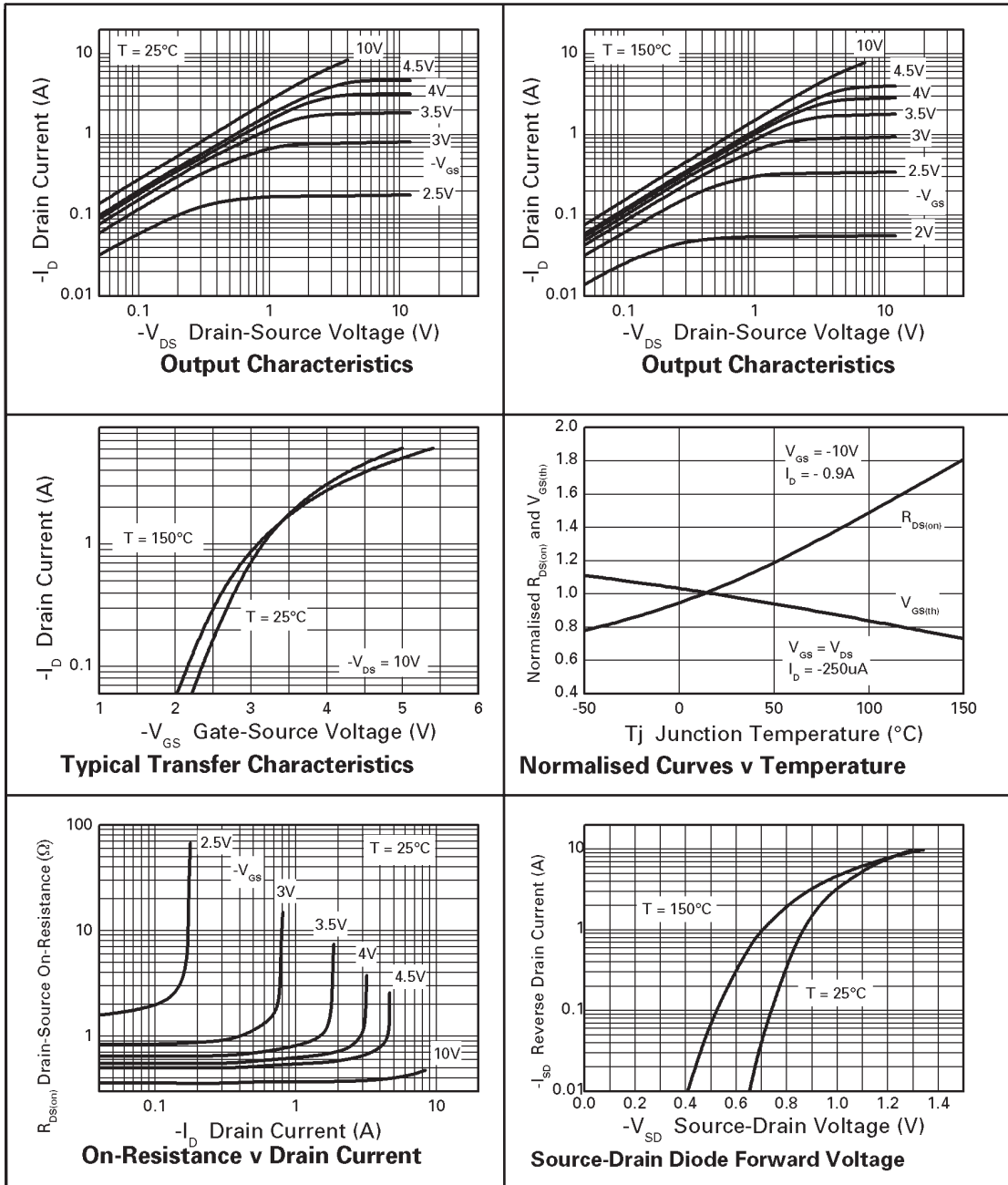
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-60			V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-1	μA	$V_{DS} = -60\text{V}$, $V_{GS} = 0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1.0			V	$I_D = -250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-State Resistance ⁽¹⁾	$R_{DS(on)}$			0.390 0.595	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}		233		pF	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$
Output Capacitance	C_{oss}		17.4		pF	
Reverse Transfer Capacitance	C_{rss}		9.6		pF	
SWITCHING ^{(2) (3)}						
Turn-On Delay Time	$t_{d(on)}$		1.6		ns	$V_{DD} = -30\text{V}$, $I_D = -1\text{A}$ $R_G = 6.0\Omega$, $V_{GS} = -10\text{V}$
Rise Time	t_r		2.3		ns	
Turn-Off Delay Time	$t_{d(off)}$		13		ns	
Fall Time	t_f		5.8		ns	
Gate Charge	Q_g		2.4		nC	$V_{DS} = -30\text{V}$, $V_{GS} = -5\text{V}$, $I_D = -0.9\text{A}$
Total Gate Charge	Q_g		5.1		nC	$V_{DS} = -30\text{V}$, $V_{GS} = -10\text{V}$, $I_D = -0.9\text{A}$
Gate-Source Charge	Q_{gs}		0.7		nC	
Gate-Drain Charge	Q_{gd}		0.7		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}		22.6		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}		23.2		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.

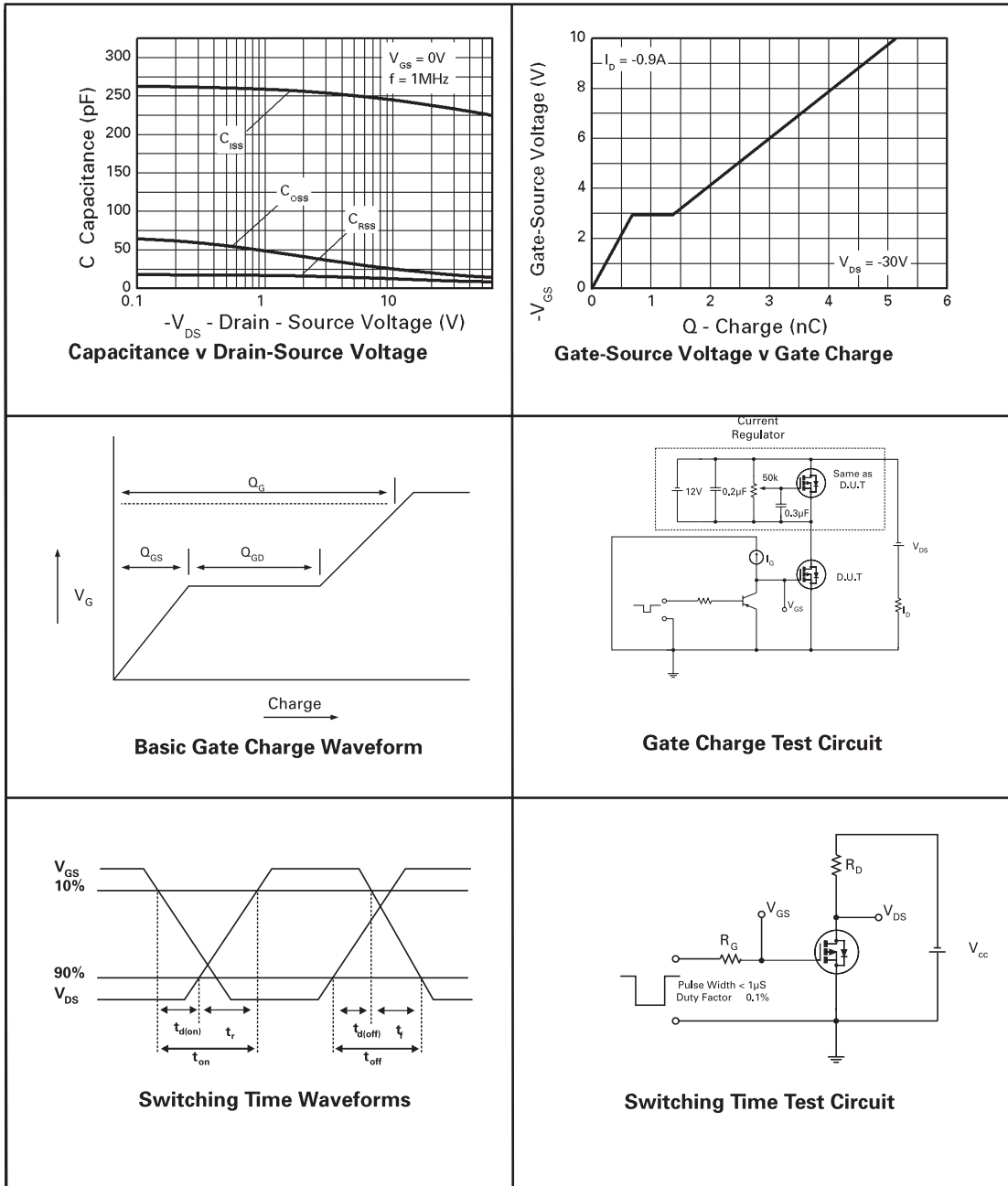
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TYPICAL CHARACTERISTICS



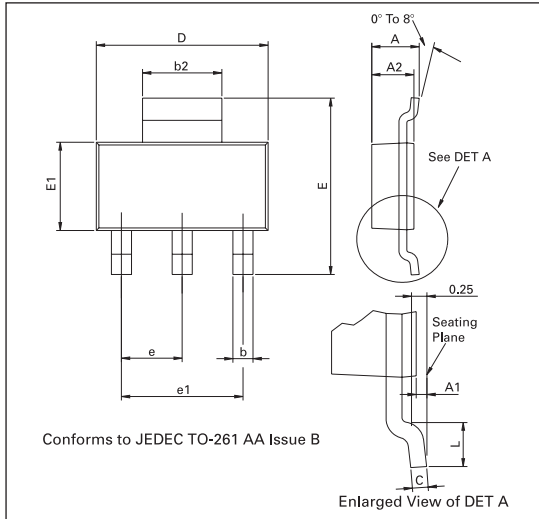
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TYPICAL CHARACTERISTICS

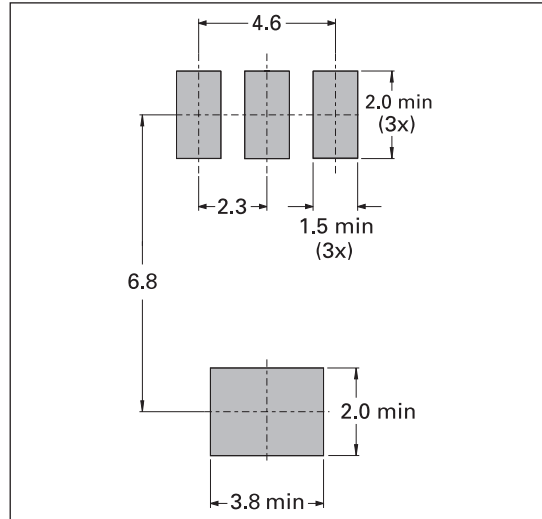


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PACKAGE OUTLINE



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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Europe	Americas	Asia Pacific	Corporate Headquarters
Zetex GmbH Streitfeldstraße 19 D-81673 München Germany	Zetex Inc 700 Veterans Memorial Hwy Hauppauge, NY 11788 USA	Zetex (Asia) Ltd 3701-04 Metroplaza Tower 1 Hing Fong Road, Kwai Fong Hong Kong	Zetex Semiconductors plc Lansdowne Road, Chadderton Oldham, OL9 9TY United Kingdom
Telephone: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 europa.sales@zetex.com	Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	Telephone: (852) 26100 611 Fax: (852) 24250 494 asia.sales@zetex.com	Telephone (44) 161 622 4444 Fax: (44) 161 622 4446 hq@zetex.com

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