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.



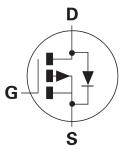
SOT223

FEATURES

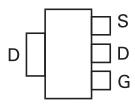
- Low on-resistance
- · Fast switching speed
- · Low threshold
- Low gate drive
- SOT223 package

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



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°C)(b) (V_{GS} = -10V; T_A =70°C)(b) (V_{GS} = -10V; T_A =25°C)(a)	I _D	-2.3 -1.9 -1.7	А
Pulsed Drain Current ^(c)	I _{DM}	-7.8	А
Continuous Source Current (Body Diode) (b)	Is	-4.1	А
Pulsed Source Current (Body Diode) ^(c)	I _{SM}	-7.8	А
Power Dissipation at T _A =25°C ^(a) Linear Derating Factor	P _D	2.0 16	W mW/°C
Power Dissipation at T _A =25°C ^(b) Linear Derating Factor	P _D	3.9 31	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)	$R_{\theta JA}$	62.5	°C/W
Junction to Ambient ^(b)	$R_{\theta JA}$	32.2	°C/W

NOTES:

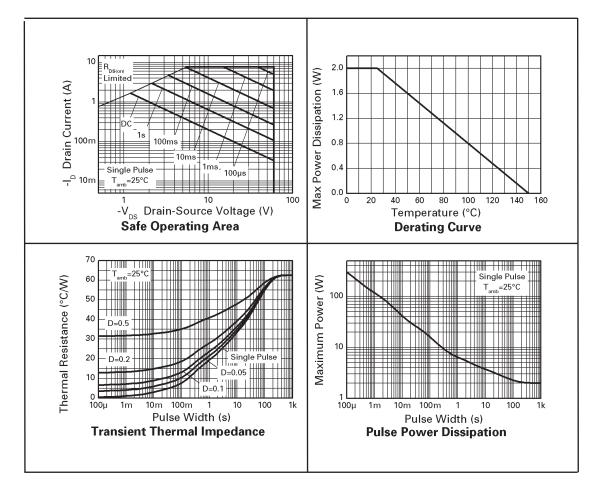
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

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

(c) Repetitive rating $25 \text{mm} \times 25 \text{mm}$ FR4 PCB, D=0.05 pulse width limited by maximum junction temperature.



CHARACTERISTICS





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

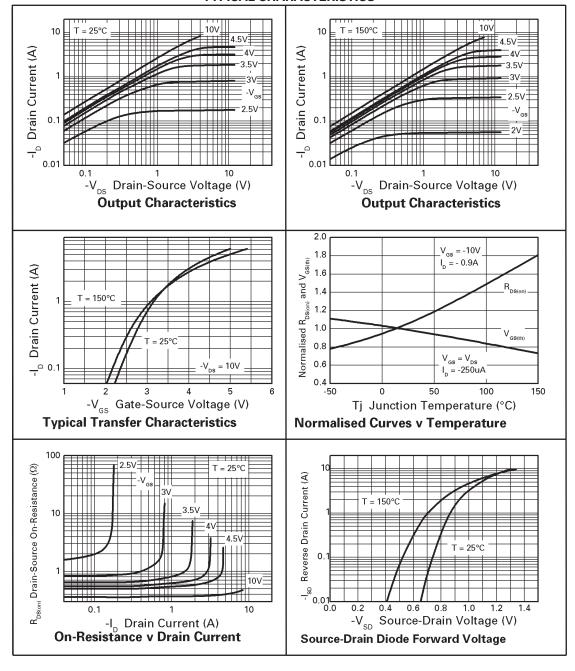
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS		
STATIC			•	'				
Drain-Source Breakdown Voltage	V _{(BR)DSS}	-60			V	I _D =-250μA, V _{GS} =0V		
Zero Gate Voltage Drain Current	I _{DSS}			-1	μΑ	V _{DS} =-60V, V _{GS} =0V		
Gate-Body Leakage	I _{GSS}			100	nA	V_{GS} = $\pm 20V$, V_{DS} = $0V$		
Gate-Source Threshold Voltage	V _{GS(th)}	-1.0			٧	$I_{D}^{=-250}\mu A, V_{DS}^{=}V_{GS}$		
Static Drain-Source On-State Resistance (1)	R _{DS(on)}			0.390 0.595	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	.,		
Output Capacitance	C _{oss}		25.7		pF	V _{DS} =-30V, V _{GS} =0V, f=1MHz		
Reverse Transfer Capacitance	C _{rss}		20.5		pF	1		
SWITCHING ^{(2) (3)}			•					
Turn-On Delay Time	t _{d(on)}		1.6		ns			
Rise Time	t _r		2.2		ns	$V_{DD} = -30V, I_{D} = -1A$		
Turn-Off Delay Time	t _{d(off)}		11.2		ns	V_{DD} =-30V, I_{D} =-1A $R_{G} \approx 6.0\Omega$, V_{GS} =-10V		
Fall Time	t _f		5.7		ns			
Gate Charge	Qg		3.2		nC	V _{DS} =-30V,V _{GS} =-5V, I _D =-0.9A		
Total Gate Charge	Qg		5.9		nC			
Gate-Source Charge	Q _{gs}		0.74		nC	V_{DS} =-30V, V_{GS} =-10V, I_{D} =-0.9A		
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,		
Reverse Recovery Charge (3)	Q _{rr}		19.3		nC	di/dt= 100A/μs		

NOTES:

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

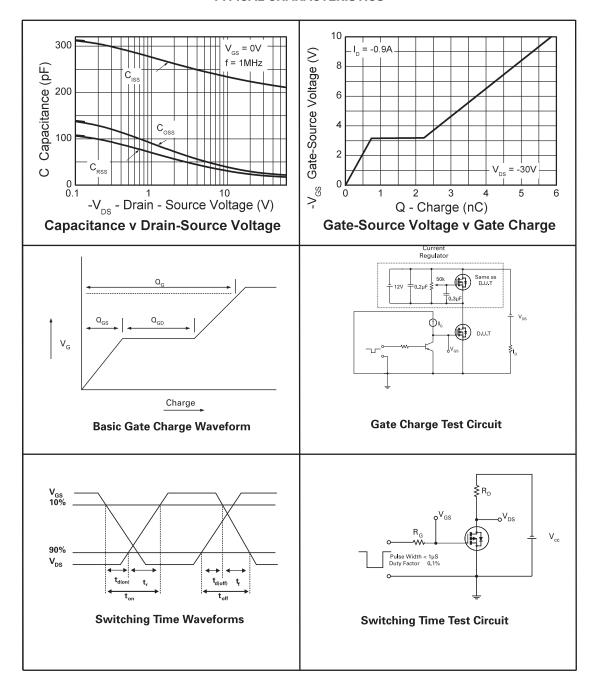


TYPICAL CHARACTERISTICS





TYPICAL CHARACTERISTICS





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Datasheet status key:

"Draft version"This term denotes a very early datasheet version and contains highly provisional

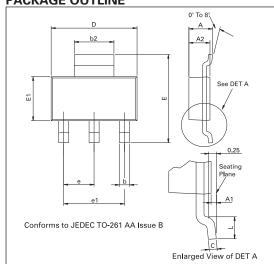
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PACKAGE OUTLINE



PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max	IVII	Min	Max	Min	Max
Α	-	1.80	-	0.071	е	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	Е	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
С	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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