

30V P-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = -30V$; $R_{DS(ON)} = 0.21\Omega$; $I_D = -1.6A$

DESCRIPTION

This new generation of trench MOSFETs from TY 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.

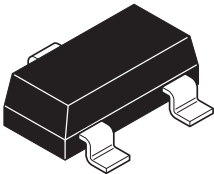
- FEATURES
- Low on-resistance
 - Fast switching speed
 - Low threshold
 - Low gate drive
 - SOT23 package

- APPLICATIONS
- DC - DC converters
 - Power management functions
 - Disconnect switches
 - Motor control

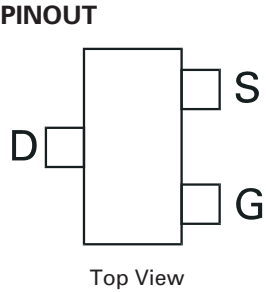
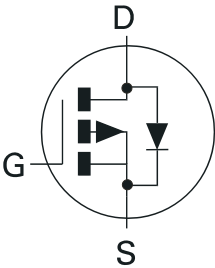
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMP3A13FTA	7"	8mm	3000 units
ZXMP3A13FTC	13"	8mm	10000 units

- DEVICE MARKING
- 313



SOT23



ZXMP3A13F

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	-30	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	-1.6 -1.3 -1.4	A
Pulsed Drain Current (c)	I_{DM}	-6	A
Continuous Source Current (Body Diode) (b)	I_S	-1.2	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	-6	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 6.4	mW 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)	$R_{\theta JA}$	200	$^\circ C/W$
Junction to ambient (b)	$R_{\theta JA}$	155	$^\circ C/W$

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 $t \leq 5$ secs.

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

ZXMP3A13F

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}	-30			V	I _D =-250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			-0.5	μA	V _{DS} =-30V, 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)}			0.210 0.330	Ω Ω	V _{GS} =-10V, I _D =-1.4A V _{GS} =-4.5V, I _D =-1.1A
Forward Transconductance (1)(3)	g _{fs}		2.4		S	V _{DS} =-15V,I _D =-1.4A
DYNAMIC (3)						
Input Capacitance	C _{iss}		206		pF	V _{DS} =-15V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{oss}		59.3		pF	
Reverse Transfer Capacitance	C _{rss}		49.2		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t _{d(on)}		1.5		ns	V _{DD} =-15V, I _D =-1A R _G =6.0Ω, V _{GS} =-10V
Rise Time	t _r		3.0		ns	
Turn-Off Delay Time	t _{d(off)}		11.1		ns	
Fall Time	t _f		7.6		ns	
Gate Charge	Q _g		3.8		nC	V _{DS} =-15V,V _{GS} =-5V, I _D =-1.4A
Total Gate Charge	Q _g		6.4		nC	V _{DS} =-15V,V _{GS} =-10V, I _D =-1.4A
Gate-Source Charge	Q _{gs}		0.69		nC	
Gate-Drain Charge	Q _{gd}		2.0		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V _{SD}		-0.85	-0.95	V	T _J =25°C, I _S =-1.1A, V _{GS} =0V
Reverse Recovery Time (3)	t _{rr}		15.6		ns	T _J =25°C, I _F =-0.95A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q _{rr}		9.6		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.