

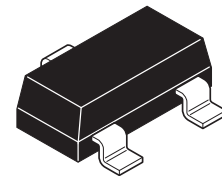
30V P-CHANNEL ENHANCEMENT MODE MOSFET

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.



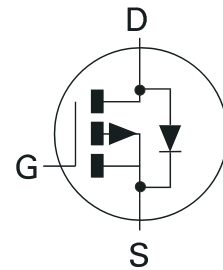
SOT23

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



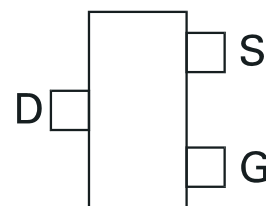
ORDERING INFORMATION

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

DEVICE MARKING

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PINOUT



Top View



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/°C
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	P_D	806 6.4	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 $t \leq 5$ 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	$I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			-0.5	μA	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
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)	$R_{DS(on)}$			0.210 0.330	Ω	$V_{GS} = -10\text{V}, I_D = -1.4\text{A}$ $V_{GS} = -4.5\text{V}, I_D = -1.1\text{A}$
Forward Transconductance (1)(3)	g_{fs}		2.4		S	$V_{DS} = -15\text{V}, I_D = -1.4\text{A}$
DYNAMIC (3)						
Input Capacitance	C_{iss}		206		pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
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	$V_{DD} = -15\text{V}, I_D = -1\text{A}$ $R_G = 6.0\Omega, V_{GS} = -10\text{V}$
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	$V_{DS} = -15\text{V}, V_{GS} = -5\text{V}, I_D = -1.4\text{A}$
Total Gate Charge	Q_g		6.4		nC	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, I_D = -1.4\text{A}$
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	$T_J = 25^\circ\text{C}, I_S = -1.1\text{A}, V_{GS} = 0\text{V}$
Reverse Recovery Time (3)	t_{rr}		15.6		ns	$T_J = 25^\circ\text{C}, I_F = -0.95\text{A}, di/dt = 100\text{A}/\mu\text{s}$
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.