

20V N-CHANNEL ENHANCEMENT MODE MOSFET

ZXM61N02F

SUMMARY

$V_{(BR)DSS}=20V$; $R_{DS(ON)}=0.18\Omega$; $I_D=1.7A$

DESCRIPTION

This new generation of high density MOSFETs from TY utilises 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

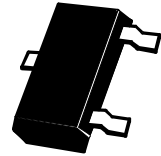
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

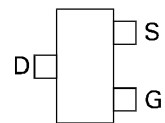
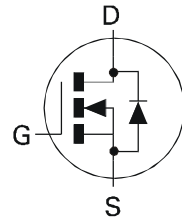
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61N02FTA	7	8mm embossed	3000 units
ZXM61N02FTC	13	8mm embossed	10000 units

DEVICE MARKING

- N02



SOT23



Top View



ZXM61N02F

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($V_{GS}=4.5V$; $T_A=25^\circ C$)(b) ($V_{GS}=4.5V$; $T_A=70^\circ C$)(b)	I_D	1.7 1.3	A
Pulsed Drain Current (c)	I_{DM}	7.4	A
Continuous Source Current (Body Diode) (b)	I_S	0.8	A
Pulsed Source Current (Body Diode)	I_{SM}	7.4	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 - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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

PARAMETER	SYMBOL	MIN.	TYP.(3)	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 12\text{V}$, $V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.7			V	$I_D=250\mu\text{A}$, $V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.18 0.24	Ω Ω	$V_{GS}=4.5\text{V}$, $I_D=0.93\text{A}$ $V_{GS}=2.7\text{V}$, $I_D=0.47\text{A}$
Forward Transconductance (3)	g_{fs}	1.3			S	$V_{DS}=10\text{V}$, $I_D=0.47\text{A}$
DYNAMIC (3)						
Input Capacitance	C_{iss}		160		pF	$V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$
Output Capacitance	C_{oss}		50		pF	
Reverse Transfer Capacitance	C_{rss}		30		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		2.4		ns	$V_{DD}=10\text{V}$, $I_D=0.93\text{A}$ $R_G=6.2\Omega$, $R_D=11\Omega$ (refer to test circuit)
Rise Time	t_r		4.2		ns	
Turn-Off Delay Time	$t_{d(off)}$		7.8		ns	
Fall Time	t_f		4.2		ns	
Total Gate Charge	Q_g			3.4	nC	$V_{DS}=16\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=0.93\text{A}$ (refer to test circuit)
Gate-Source Charge	Q_{gs}			0.41	nC	
Gate-Drain Charge	Q_{gd}			0.8	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			0.95	V	$T_J=25^\circ\text{C}$, $I_S=0.93\text{A}$, $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	t_{rr}		12.9		ns	$T_J=25^\circ\text{C}$, $I_F=0.93\text{A}$, $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	Q_{rr}		5.2		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.