

20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

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

DESCRIPTION

This new generation of high density MOSFETs from Zetex 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

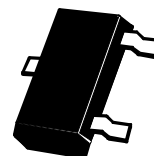
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

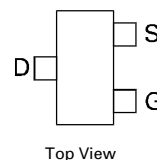
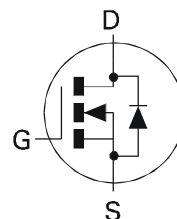
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61N02FTA	7	8mm embossed	3000 units
ZXM61N02FTC	13	8mm embossed	10000 units

DEVICE MARKING

- N02



SOT23



ZXM61N02F

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	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	$^\circ C/W$

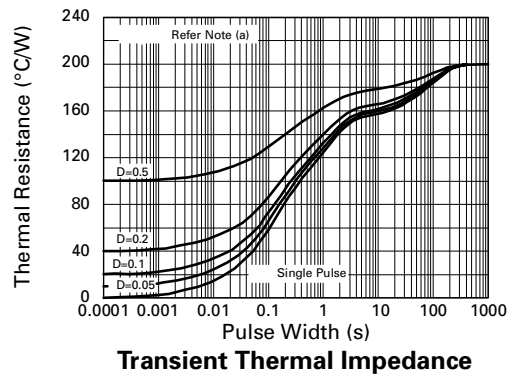
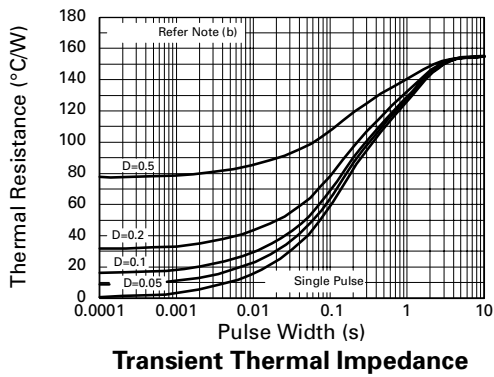
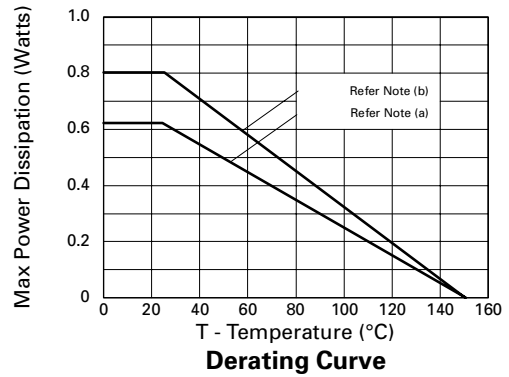
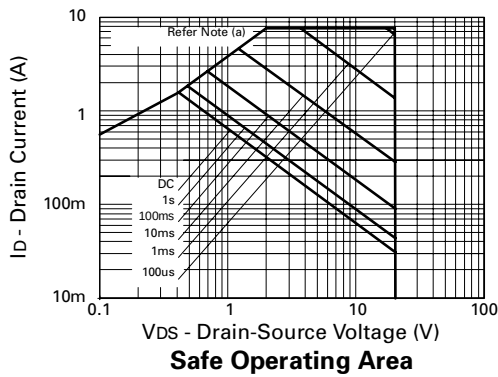
NOTES

(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.

CHARACTERISTICS



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ELECTRICAL CHARACTERISTICS (at T_A = 25°C unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.(3)	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	20			V	I _D =250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =20V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =± 12V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	0.7			V	I _D =250μA, V _{DS} = V _{GS}
Static Drain-Source On-State Resistance (1)	R _{DS(on)}			0.18 0.24	Ω Ω	V _{GS} =4.5V, I _D =0.93A V _{GS} =2.7V, I _D =0.47A
Forward Transconductance (3)	g _{fs}	1.3			S	V _{DS} =10V, I _D =0.47A
DYNAMIC (3)						
Input Capacitance	C _{iss}		160		pF	V _{DS} =15 V, V _{GS} =0V, f=1MHz
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} = 10V, I _D =0.93A R _G =6.2Ω, R _D =11Ω (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} =16V, V _{GS} =4.5V, I _D =0.93A (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°C, I _S =0.93A, V _{GS} =0V
Reverse Recovery Time (3)	t _{rr}		12.9		ns	T _J =25°C, I _F =0.93A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q _{rr}		5.2		nC	

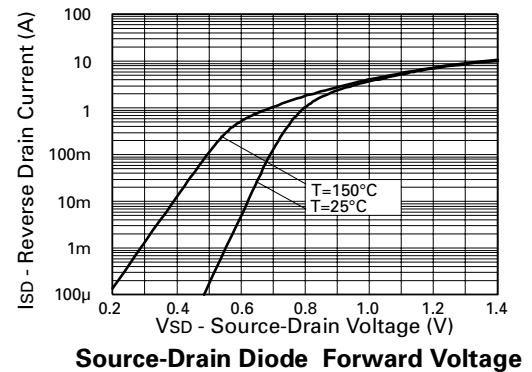
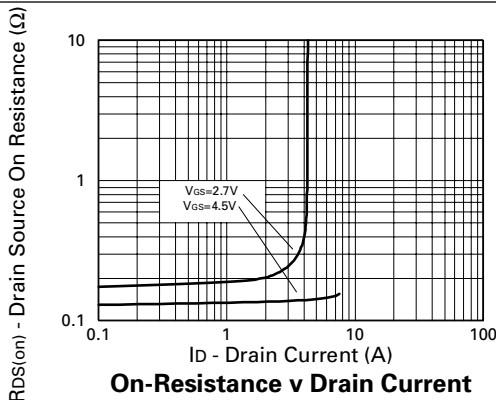
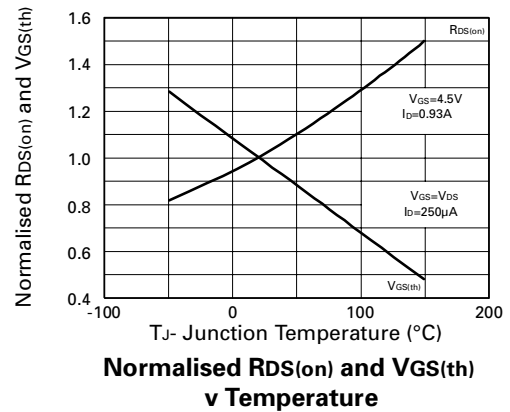
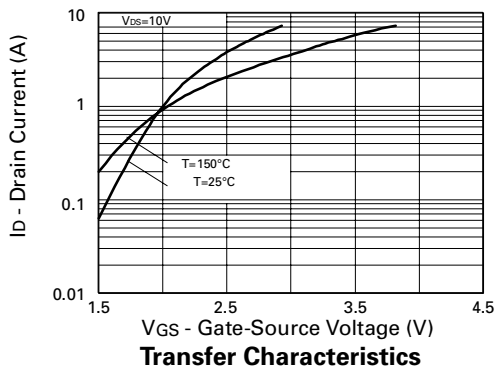
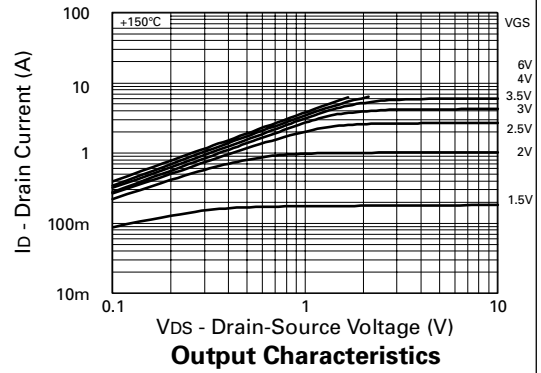
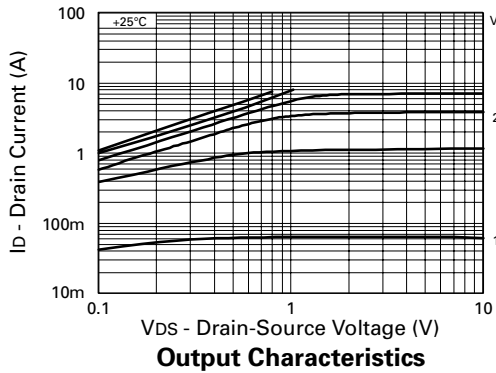
NOTES

(1) Measured under pulsed conditions. Width≤300μs. Duty cycle ≤2% .

(2) Switching characteristics are independent of operating junction temperature.

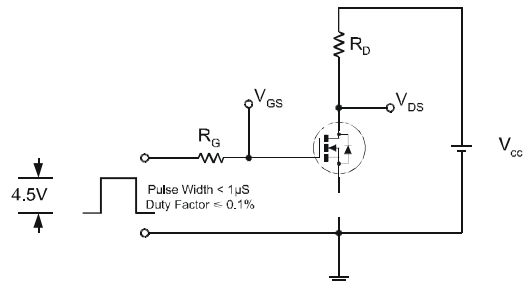
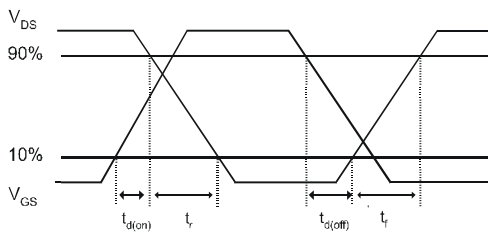
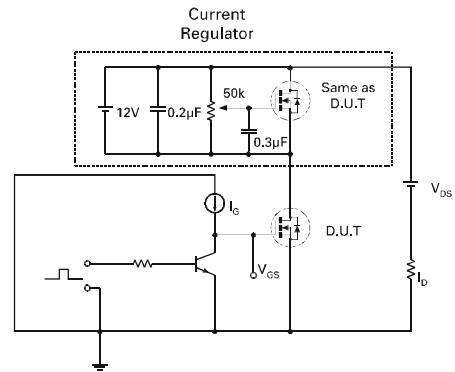
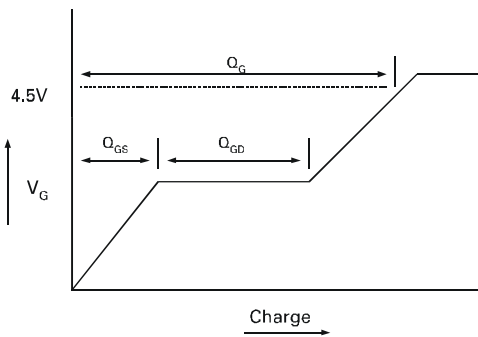
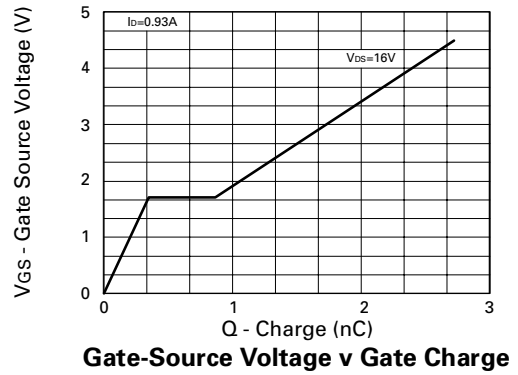
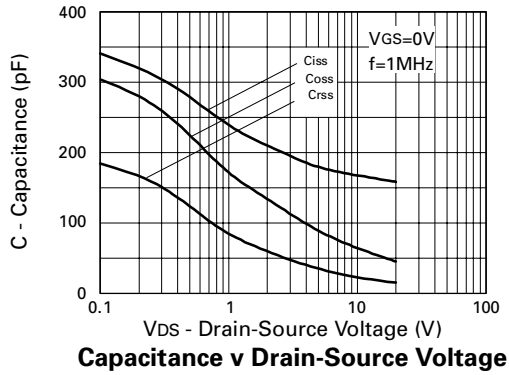
(3) For design aid only, not subject to production testing.

TYPICAL CHARACTERISTICS



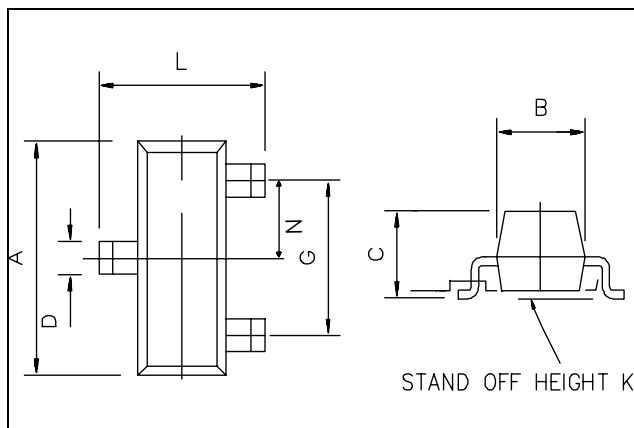
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TYPICAL CHARACTERISTICS



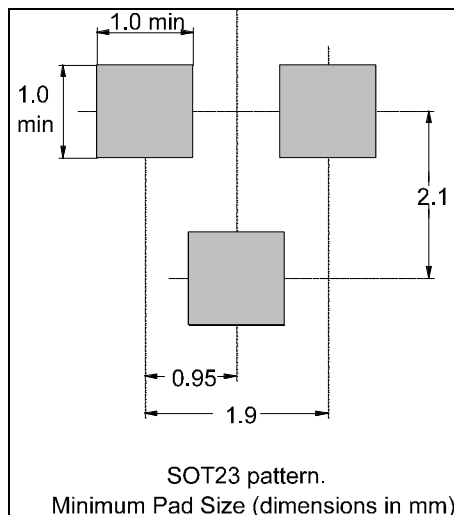
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PACKAGE DIMENSIONS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	2.67	3.05	0.105	0.120
B	1.20	1.40	0.047	0.055
C	—	1.10	—	0.043
D	0.37	0.53	0.0145	0.021
F	0.085	0.15	0.0033	0.0059
G	NOM 1.9		NOM 0.075	
K	0.01	0.10	0.0004	0.004
L	2.10	2.50	0.0825	0.0985
N	NOM 0.95		NOM 0.037	

PAD LAYOUT DETAILS



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