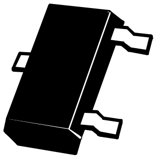
ZXM61N03F

30V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}$=30V; $R_{DS(ON)}$=0.22Ω; I_D=1.4A



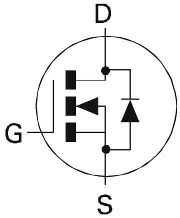
SOT23

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.

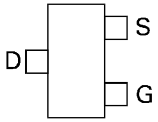
FEATURES

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



APPLICATIONS

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



Top View

ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM61N03FTA	7	8mm embossed	3000 units
ZXM61N03FTC	13	8mm embossed	10000 units

DEVICE MARKING

- N03

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°C)(b) (V_{GS}=10V; T_A=70°C)(b)	I_D	1.4 1.1	A
Pulsed Drain Current (c)	I_{DM}	7.3	A
Continuous Source Current (Body Diode) (b)	I_S	0.8	A
Pulsed Source Current (Body Diode)	I_{SM}	7.3	A
Power Dissipation at T_A=25°C (a) Linear Derating Factor	P_D	625 5	mW mW/°C
Power Dissipation at T_A=25°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

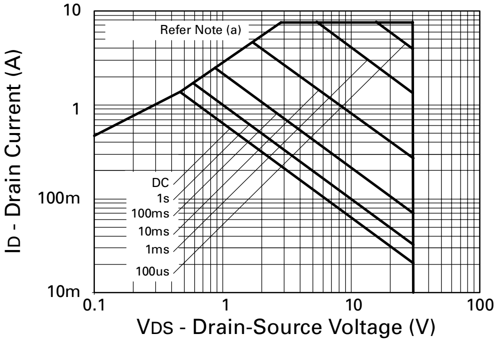
NOTES

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

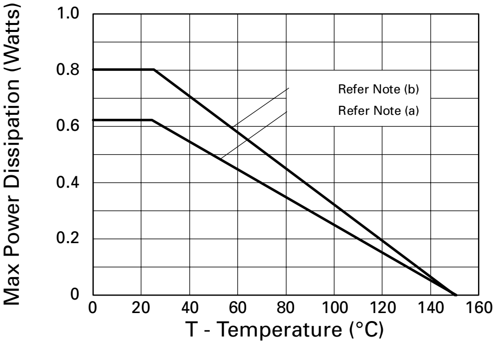
(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.

(c) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

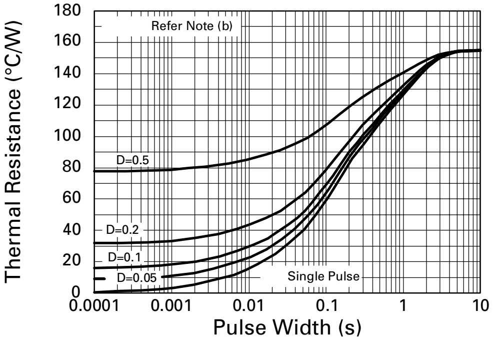
CHARACTERISTICS



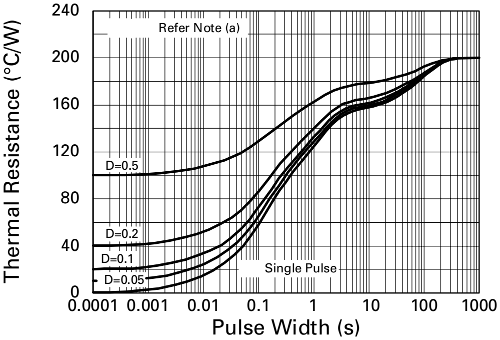
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Transient Thermal Impedance

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

PARAMETER	SYMBOL	MIN.	TYP.(3)	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu A$, $V_{GS}=0V$
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	$V_{DS}=30V$, $V_{GS}=0V$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 20V$, $V_{DS}=0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			V	$I_D=250\mu A$, $V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.22 0.30	Ω Ω	$V_{GS}=10V$, $I_D=0.91A$ $V_{GS}=4.5V$, $I_D=0.46A$
Forward Transconductance (3)	g_{fs}	0.87			S	$V_{DS}=10V$,$I_D=0.46A$
DYNAMIC (3)						
Input Capacitance	C_{iss}		150		pF	$V_{DS}=25\ V$, $V_{GS}=0V$, f=1MHz
Output Capacitance	C_{oss}		35		pF	
Reverse Transfer Capacitance	C_{rss}		15		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		1.9		ns	$V_{DD}=15V$, $I_D=0.91A$ $R_G=6.2\Omega$, $R_D=16\Omega$ (refer to test circuit)
Rise Time	t_r		2.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		5.8		ns	
Fall Time	t_f		3.0		ns	
Total Gate Charge	Q_g			4.1	nC	$V_{DS}=24V$,$V_{GS}=10V$, $I_D=0.91A$ (refer to test circuit)
Gate-Source Charge	Q_{gs}			0.4	nC	
Gate-Drain Charge	Q_{gd}			0.63	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			0.95	V	$T_J=25°C$, $I_S=0.91A$, $V_{GS}=0V$
Reverse Recovery Time (3)	t_{rr}		11.0		ns	$T_J=25°C$, $I_F=0.91A$, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		3.5		nC	

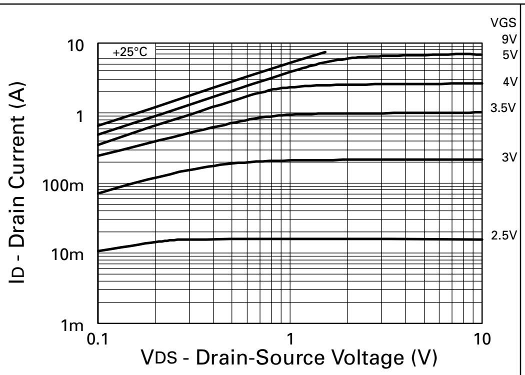
NOTES

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

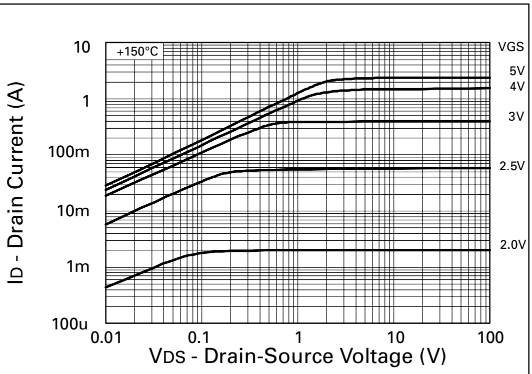
(2) Switching characteristics are independent of operating junction temperature.

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

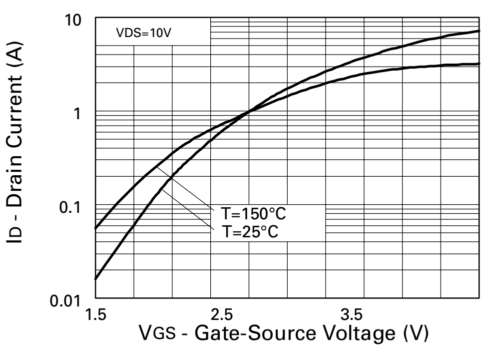
TYPICAL CHARACTERISTICS



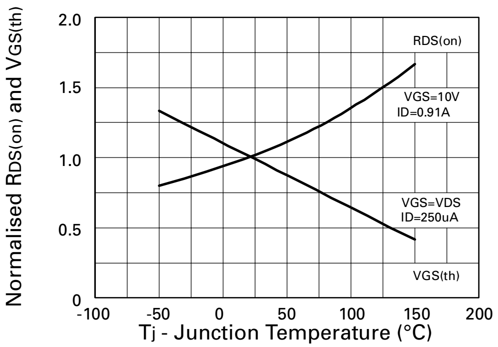
Output Characteristics



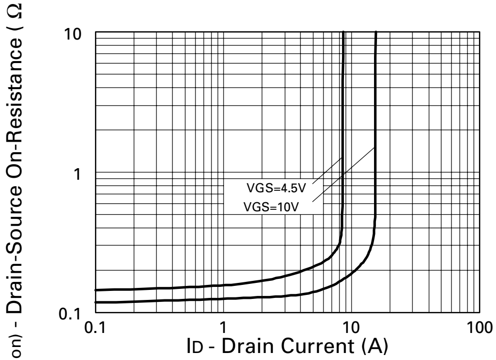
Ouput Characteristics



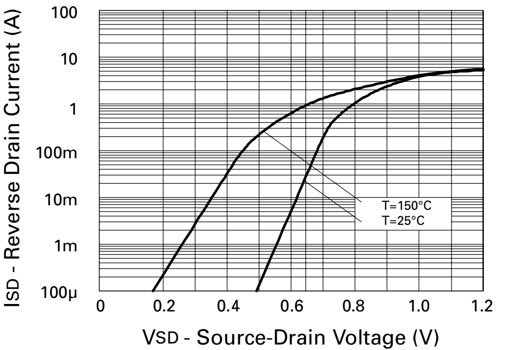
Typical Transfer Characteristics



Normalised RDS(on) and VGS(th) v Temperature

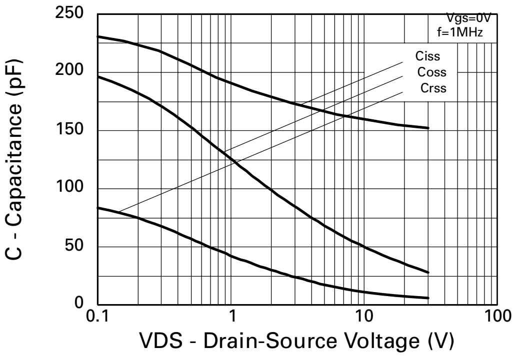


On-Resistance v Drain Current

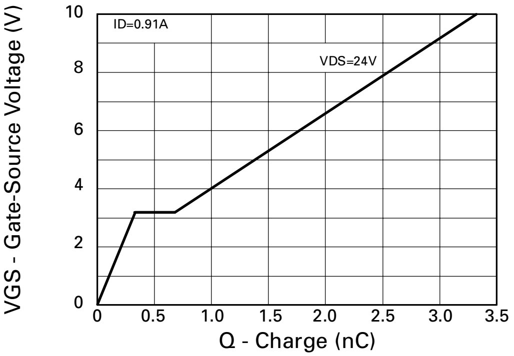


Source-Drain Diode Forward Voltage

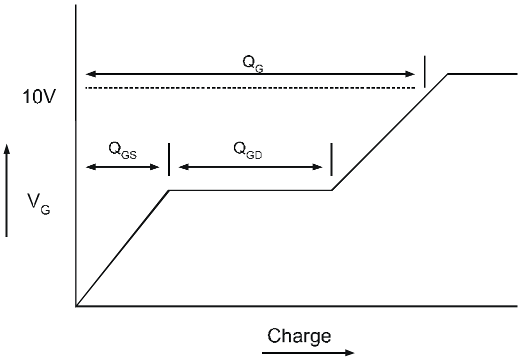
TYPICAL CHARACTERISTICS



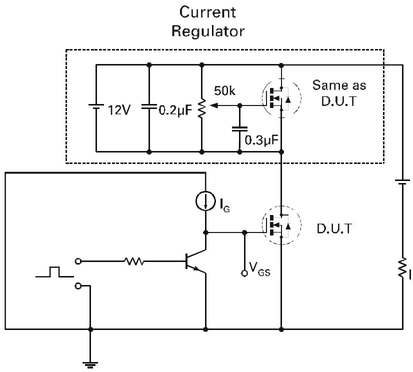
Capacitance v Drain-Source Voltage



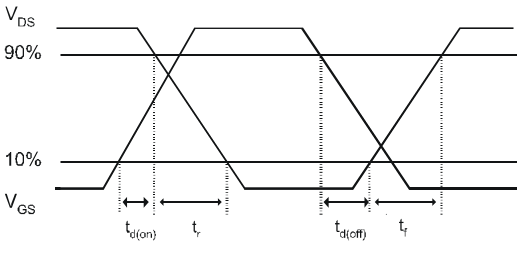
Gate-Source Voltage v Gate Charge



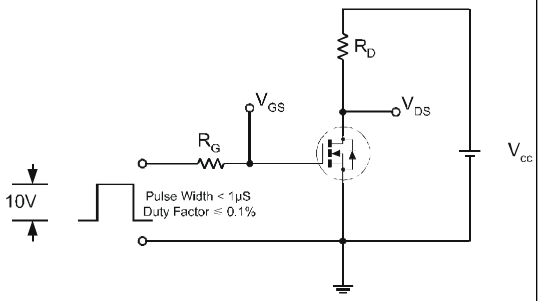
Basic Gate Charge Waveform



Gate Charge Test Circuit

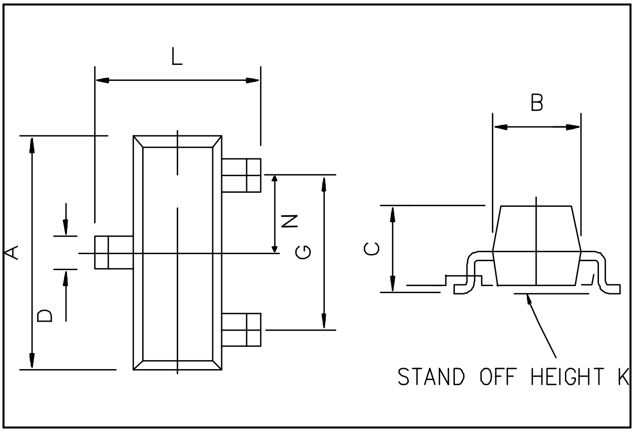


Switching Time Waveforms



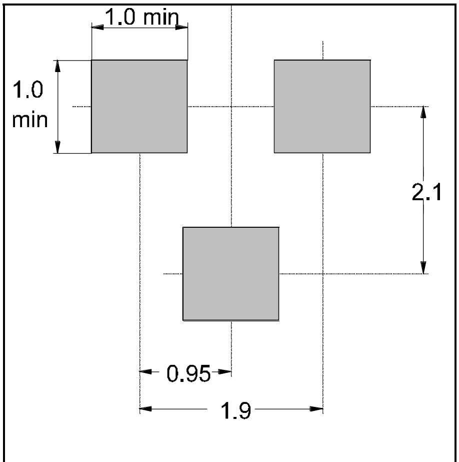
Switching Time Test Circuit

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



SOT23 pattern.
Minimum Pad Size (dimensions in mm)

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