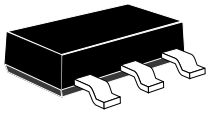
ZXM62N03G

30V N-CHANNEL ENHANCEMENT MODE MOSFET

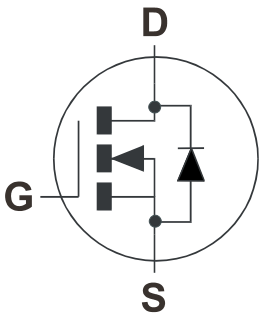
SUMMARY
$V_{(BR)DSS}$ = 30V: $R_{DS(on)}$ = 0.11Ω: I_D = 4.7A



SOT223

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.

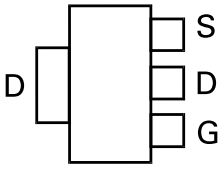
FEATURES
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT223 package



APPLICATIONS
- DC-DC Converters
- Audio Output Stage
- Relay and Soleniod driving
- Motor Control

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXM62N03GTA	7”	12mm	1000 units
ZXM62N03GTC	13”	12mm	4000 units



Top View

DEVICE MARKING
- ZXM6
  2N03

ABSOLUTE MAXIMUM RATING

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) (V_{GS}=10V; T_A=25°C)(a)	I_D	4.7 3.8 3.4	A
Pulsed Drain Current (c)	I_{DM}	16	A
Continuous Source Current (Body Diode) (b)	I_S	2.6	A
Pulsed Source Current (Body Diode)(c)	I_{SM}	16	A
Power Dissipation at T_A=25°C (a) Linear Derating Factor	P_D	2.0 16	W mW/°C
Power Dissipation at T_A=25°C (b) Linear Derating Factor	P_D	3.9 31	W mW/°C
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +150	°C

THERMAL RESISTANCE

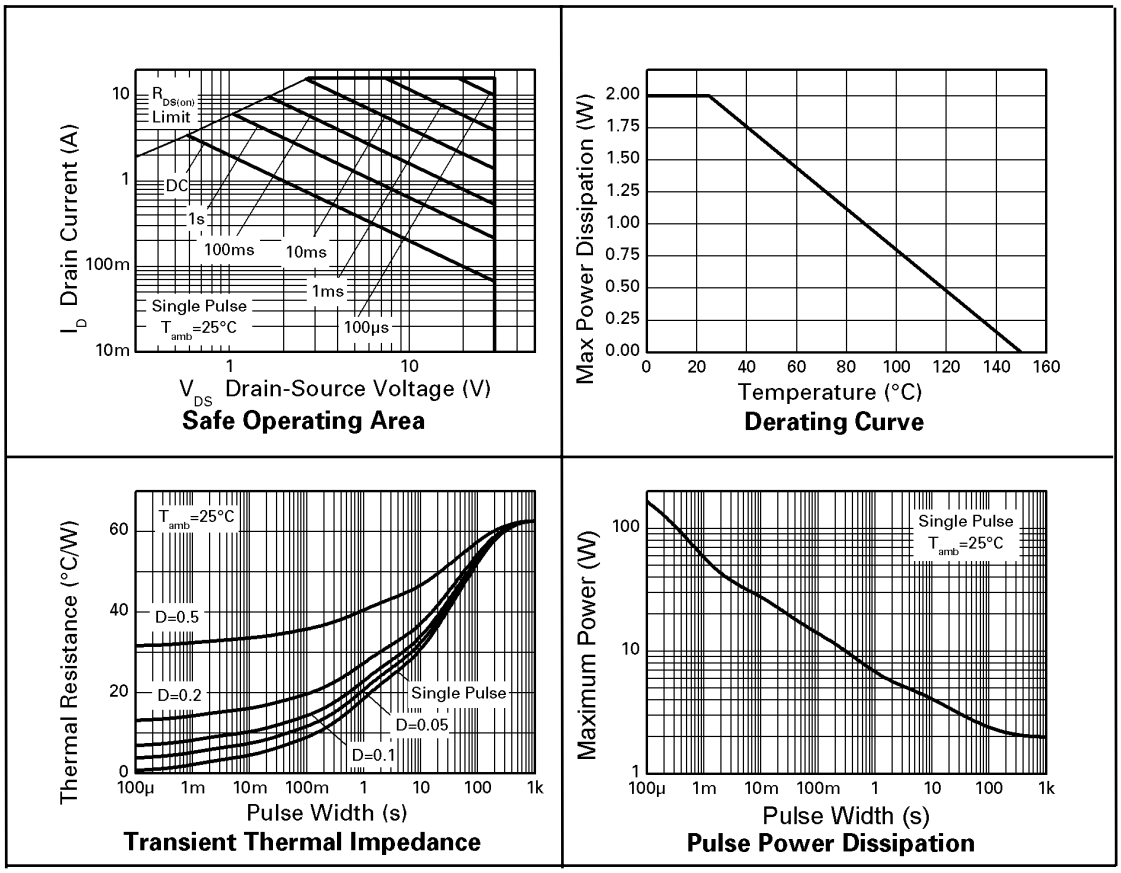
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	62.5	°C/W
Junction to Ambient (b)	$R_{\theta JA}$	32	°C/W

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≤10 secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D=0.05 pulse width limited by maximum junction temperature.

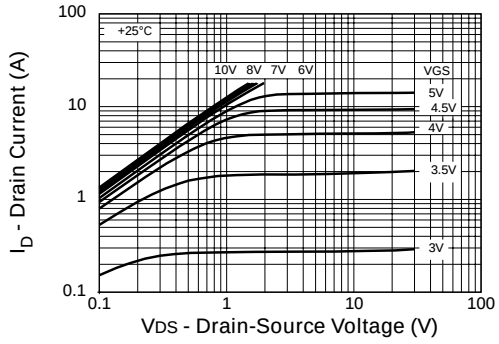

10
1
100m
10m
I_D Drain Current (A)
$R_{DS(on)}$ Limit
DC
1s
100ms
10ms
1ms
100µs
Single Pulse
T_{amb}=25°C
1
10
V_{DS} Drain-Source Voltage (V)
Safe Operating Area
Max Power Dissipation (W)
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0
20
40
60
80
100
120
140
160
Temperature (°C)
Derating Curve
Thermal Resistance (°C/W)
60
40
20
0
T_{amb}=25°C
D=0.5
D=0.2
Single Pulse
D=0.05
D=0.1
100µ
1m
10m
100m
1
10
100
1k
Pulse Width (s)
Transient Thermal Impedance
Maximum Power (W)
100
10
1
Single Pulse
T_{amb}=25°C
100µ
1m
10m
100m
1
10
100
1k
Pulse Width (s)
Pulse Power Dissipation

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

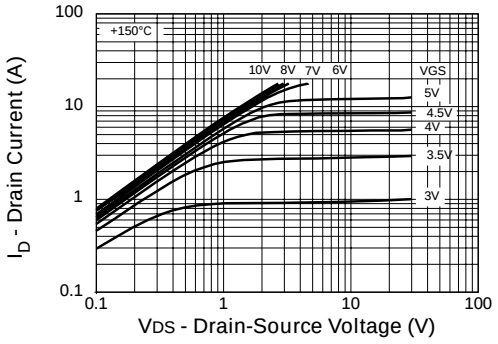
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30			V	I_D=250μA, V_{GS}=0V
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	V_{DS}=30V, V_{GS}=0V
Gate-Body Leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			V	I_D=250μA, V_{DS}= V_{GS}
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.11 0.15	Ω Ω	V_{GS}=10V, I_D=2.2A V_{GS}=4.5V, I_D=1.1A
Forward Transconductance (1)(3)	g_{fs}	1.1			S	V_{DS}=15V,I_D=1.1A
DYNAMIC (3)						
Input Capacitance	C_{iss}		380		pF	V_{DS}=25V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		90		pF	
Reverse Transfer Capacitance	C_{rss}		30		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		2.9		ns	V_{DD} =15V, I_D=2.2A R_G=6.0Ω, V_{GS}=10V
Rise Time	t_r		5.6		ns	
Turn-Off Delay Time	$t_{d(off)}$		11.7		ns	
Fall Time	t_f		6.4		ns	
Total Gate Charge	Q_g			9.6	nC	V_{DS}=24V,V_{GS}=10V, I_D=2.2A
Gate-Source Charge	Q_{gs}			1.7	nC	
Gate-Drain Charge	Q_{gd}			2.8	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			0.95	V	T_J=25°C, I_S=2.2A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		18.8		ns	T_J=25°C, I_F=2.2A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		11.4		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.

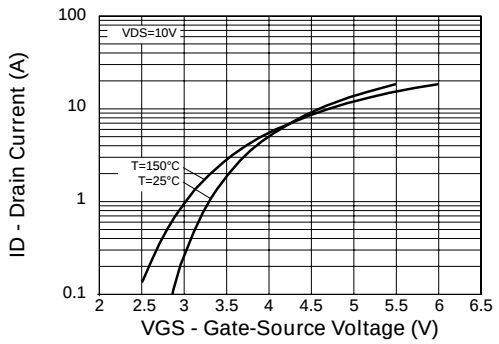
TYPICAL CHARACTERISTICS



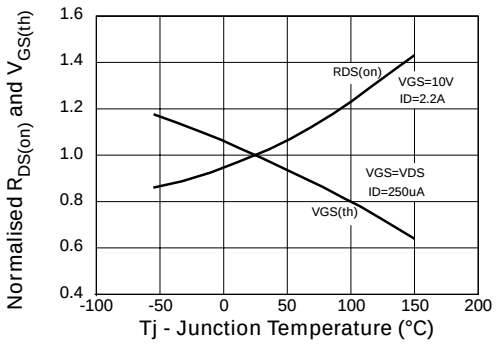
Output Characteristics



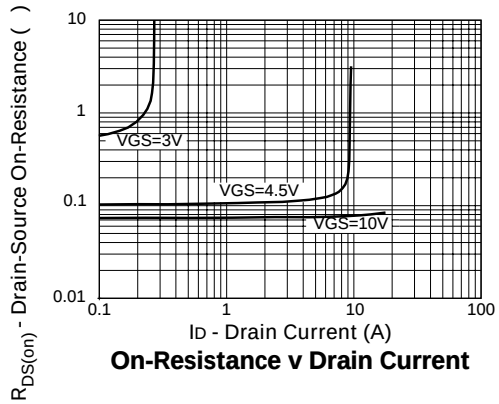
Output Characteristics



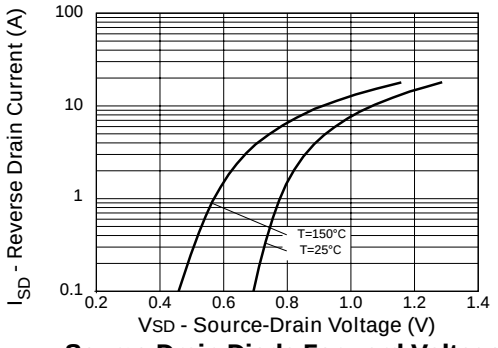
Typical Transfer Characteristics



Normalised $R_{DS(on)}$ and $V_{GS(th)}$ v Temperature

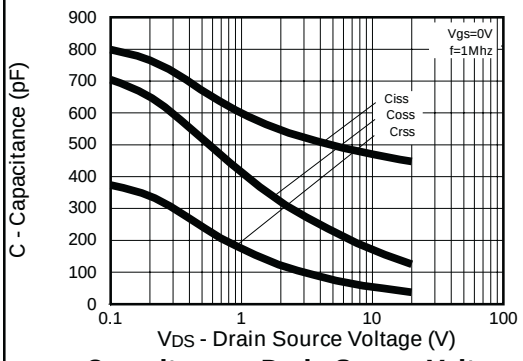


On-Resistance v Drain Current

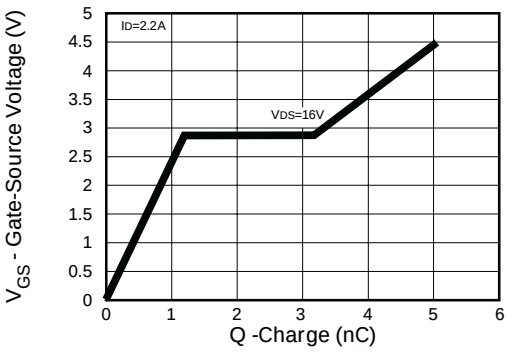


Source-Drain Diode Forward Voltage

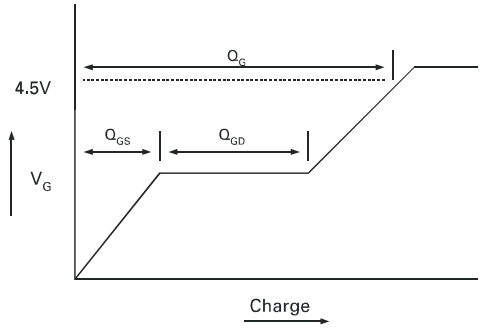
TYPICAL CHARACTERISTICS



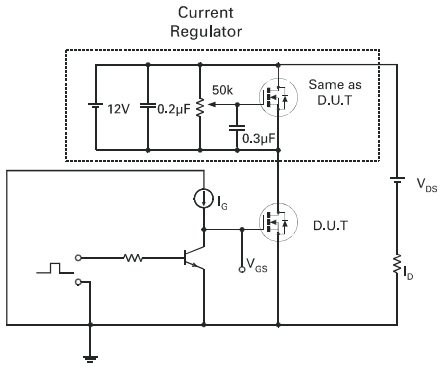
Capacitance v Drain-Source Voltage



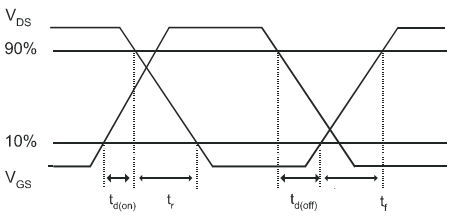
Gate-Source Voltage v Gate Charge



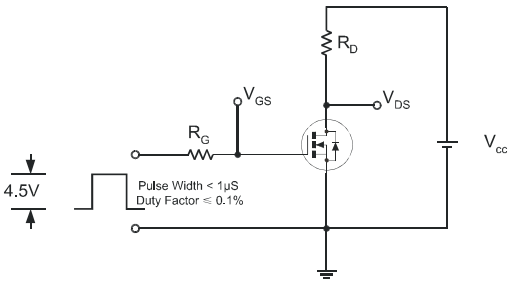
Basic Gate Charge Waveform



Gate Charge Test Circuit

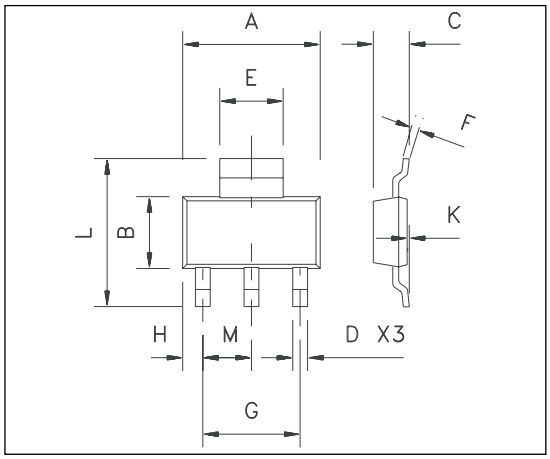


Switching Time Waveforms



Switching Time Test Circuit

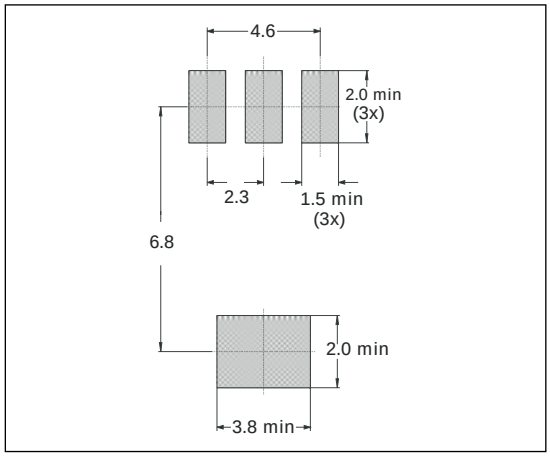
PACKAGE OUTLINE



PACKAGE DIMENSIONS

DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	6.3	6.7	0.248	0.264
B	3.3	3.7	0.130	0.146
C	-	1.7	-	0.067
D	0.6	0.8	0.024	0.031
E	2.9	3.1	0.114	0.122
F	0.24	0.32	0.009	0.13
G	NOM 4.6		NOM 0.181	
H	0.85	1.05	0.033	0.041
K	0.02	0.10	0.0008	0.004
L	6.7	7.3	0.264	0.287
M	NOM 2.3		NOM 0.0905	

PAD LAYOUT DETAILS



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