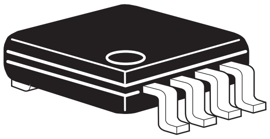
ZXMD63N03X

DUAL 30V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}$=30V; $R_{DS(ON)}$=0.135Ω; I_D=2.3A



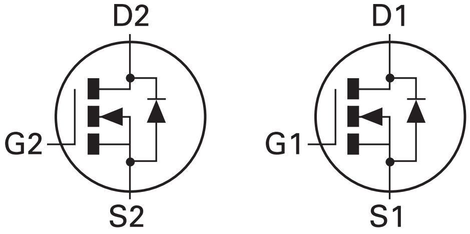
MSOP8

DESCRIPTION

This new generation of high density MOSFETs from Zetex 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.

FEATURES

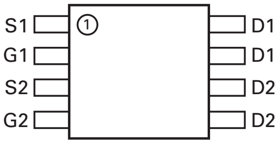
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package



APPLICATIONS

- DC - DC converters
- Power management functions
- Disconnect switches
- Motor control

Pin-out



Top view

ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM63N03NXTA	7	12 embossed	1,000
ZXM63N03NXTC	13	12 embossed	4,000

DEVICE MARKING

ZXM63N03

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}=4.5V; T_A=25°C)(b)(d) (V_{GS}=4.5V; T_A=70°C)(b)(d)	I_D	2.3 1.8	A
Pulsed Drain Current (c)(d)	I_{DM}	14	A
Continuous Source Current (Body Diode)(b)(d)	I_S	1.5	A
Pulsed Source Current (Body Diode)(c)(d)	I_{SM}	14	A
Power Dissipation at T_A=25°C (a)(d) Linear Derating Factor	P_D	0.87 6.9	W mW/°C
Power Dissipation at T_A=25°C (a)(e) Linear Derating Factor	P_D	1.04 8.3	W mW/°C
Power Dissipation at T_A=25°C (b)(d) Linear Derating Factor	P_D	1.25 10	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)(d)	$R_{\theta JA}$	143	°C/W
Junction to Ambient (b)(d)	$R_{\theta JA}$	100	°C/W
Junction to Ambient (a)(e)	$R_{\theta JA}$	120	°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

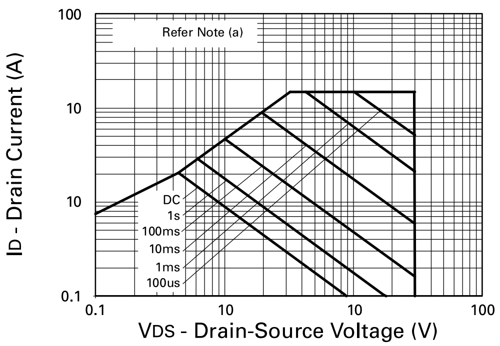
(b) For a device surface mounted on FR4 PCB measured at t⩽10 secs.

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

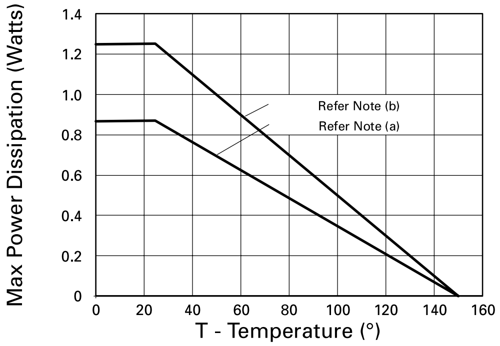
(d) For device with one active die.

(e) For device with two active die running at equal power.

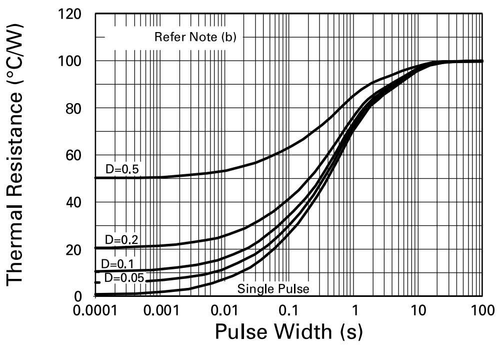
CHARACTERISTICS



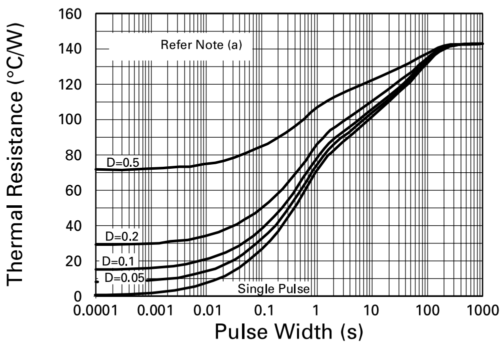
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Transient Thermal Impedance

ZETEX
SEMICONDUCTORS

ELECTRICAL CHARACTERISTICS (at T_{amb} = 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)	$R_{DS(on)}$			0.135 0.200	Ω Ω	V_{GS}=10V, I_D=1.7A V_{GS}=4.5V, I_D=0.85A
Forward Transconductance (3)	g_{fs}	1.9			S	V_{DS}=10V,I_D=0.85A
DYNAMIC (3)						
Input Capacitance	C_{iss}		290		pF	V_{DS}=25 V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		70		pF	
Reverse Transfer Capacitance	C_{rss}		20		pF	
SWITCHING (2) (3)						
Turn-On Delay Time	$t_{d(on)}$		2.5		ns	V_{DD} =15V, I_D=1.7A R_G=6.1Ω, R_D=8.7Ω (Refer to test circuit)
Rise Time	t_r		4.1		ns	
Turn-Off Delay Time	$t_{d(off)}$		9.6		ns	
Fall Time	t_f		4.4		ns	
Total Gate Charge	Q_g			8	nC	V_{DS}=24V,V_{GS}=10V, I_D=1.7A (Refer to test circuit)
Gate-Source Charge	Q_{gs}			1.2	nC	
Gate Drain Charge	Q_{gd}			2	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			0.95	V	T_j=25°C, I_S=1.7A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		16.9		ns	T_j=25°C, I_F=1.7A, di/dt= 100A/µs
Reverse Recovery Charge(3)	Q_{rr}		9.5		nC	

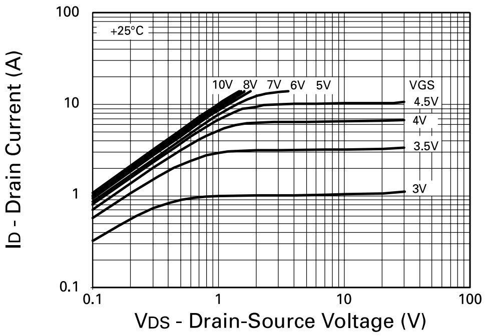
NOTES:

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

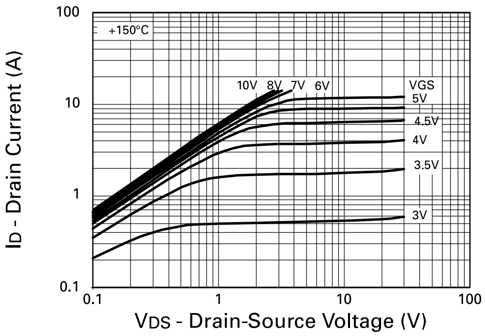
(2) Switching characteristics are independent of operating junction temperature.

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

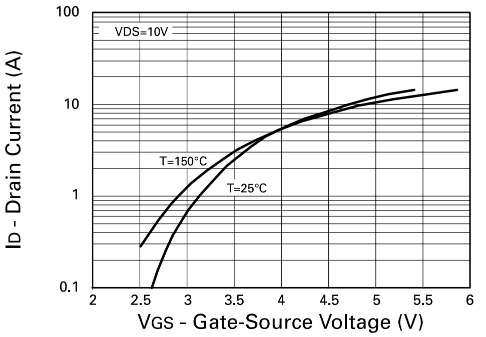
TYPICAL CHARACTERISTICS



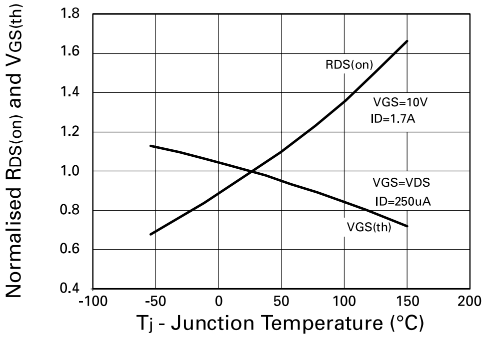
Output Characteristics



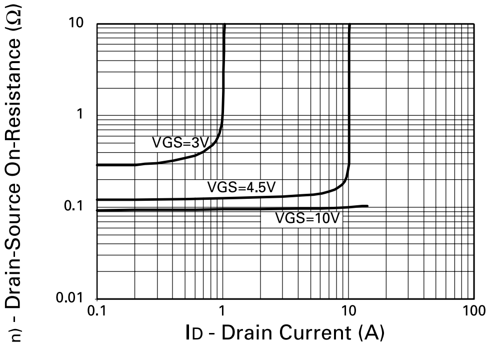
Output Characteristics



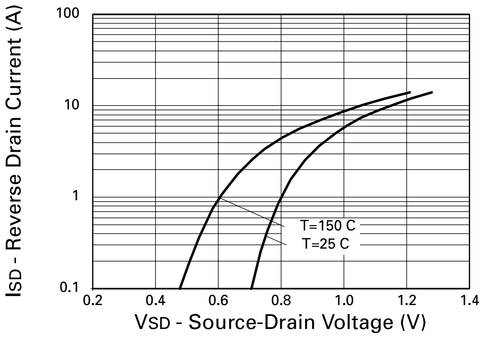
Typical Transfer Characteristics



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

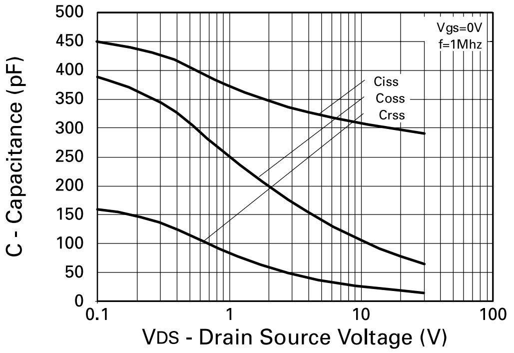


On-Resistance v Drain Current

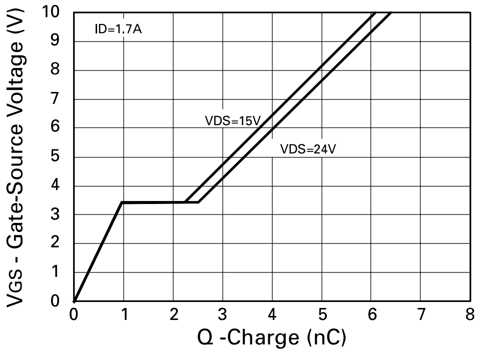


Source-Drain Diode Forward Voltage

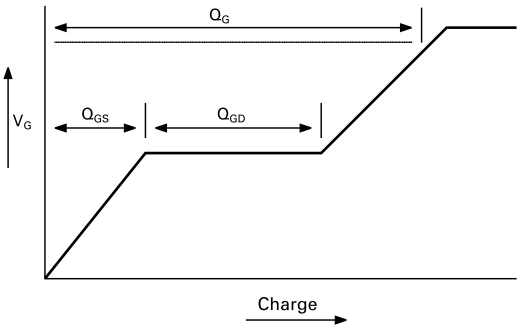
TYPICAL CHARACTERISTICS



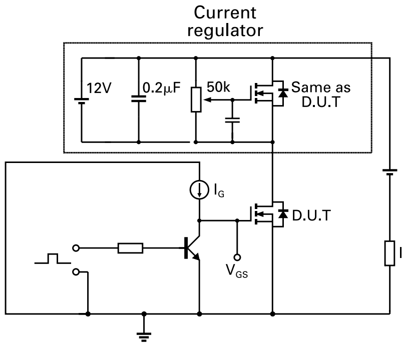
Capacitance v Drain-Source Voltage



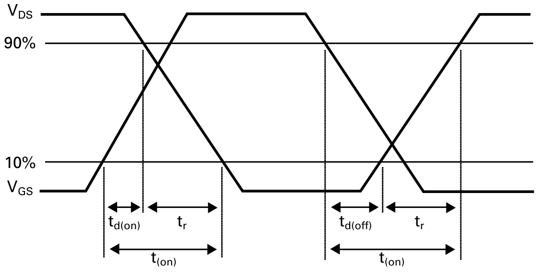
Gate-Source Voltage v Gate Charge



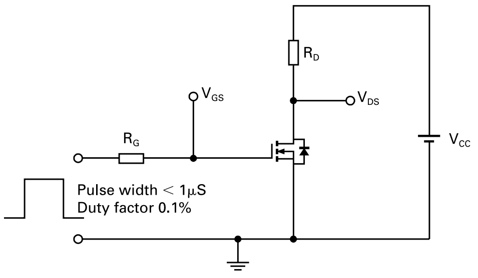
Basic gate charge waveform



Gate charge test circuit

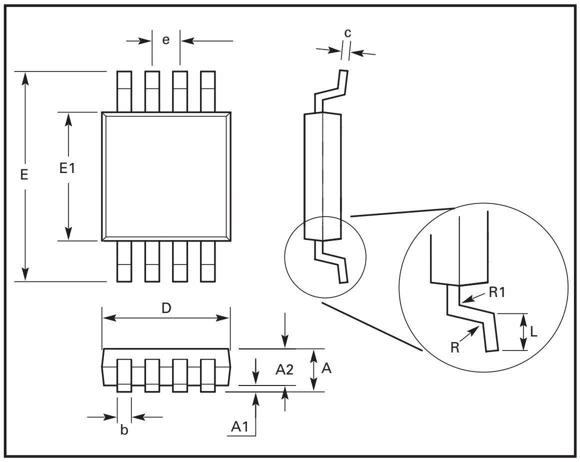


Switching time waveforms

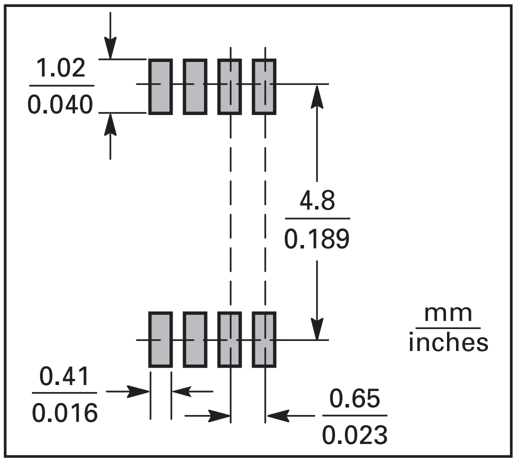


Switching time test circuit

PACKAGE DETAILS



PAD LAYOUT DETAILS



PACKAGE DIMENSIONS

DIM	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.91	1.11	0.036	0.044
A1	0.10	0.20	0.004	0.008
B	0.25	0.36	0.010	0.014
C	0.13	0.18	0.005	0.007
D	2.95	3.05	0.116	0.120
e	0.65NOM		0.0256	
e1	0.33NOM		0.0128	
E	2.95	3.05	0.116	0.120
H	4.78	5.03	0.188	0.198
L	0.41	0.66	0.016	0.026
θ°	0°	6°	0°	6°

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