

30V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}=30V$; $R_{DS(ON)}=0.045\Omega$; $I_D=5.0A$

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

ORDERING INFORMATION

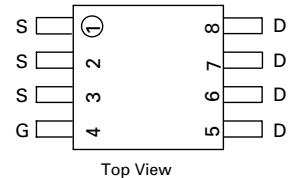
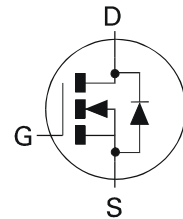
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM64N03XTA	7	12mm embossed	1000 units
ZXM64N03XTC	13	12mm embossed	4000 units

DEVICE MARKING

- ZXM4N03



MSOP8



ZXM64N03X

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	30	V
Gate- Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($V_{GS}=10V$; $T_A=25^{\circ}C$)(b) ($V_{GS}=10V$; $T_A=70^{\circ}C$)(b)	I_D	5.0 4.0	A
Pulsed Drain Current (c)	I_{DM}	30	A
Continuous Source Current (Body Diode)(b)	I_S	2.4	A
Pulsed Source Current (Body Diode)(c)	I_{SM}	30	A
Power Dissipation at $T_A=25^{\circ}C$ (a) Linear Derating Factor	P_D	1.1 8.8	W mW/ $^{\circ}C$
Power Dissipation at $T_A=25^{\circ}C$ (b) Linear Derating Factor	P_D	1.8 14.4	W 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)	$R_{\theta JA}$	113	$^{\circ}C/W$
Junction to Ambient (b)	$R_{\theta JA}$	70	$^{\circ}C/W$

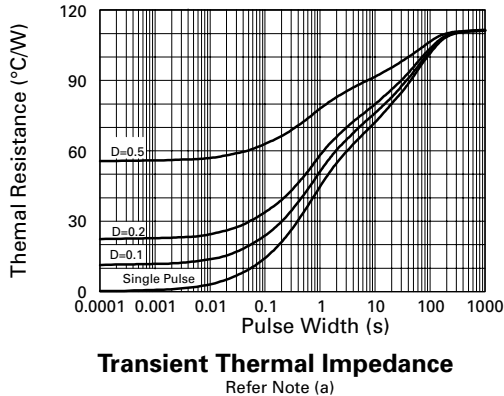
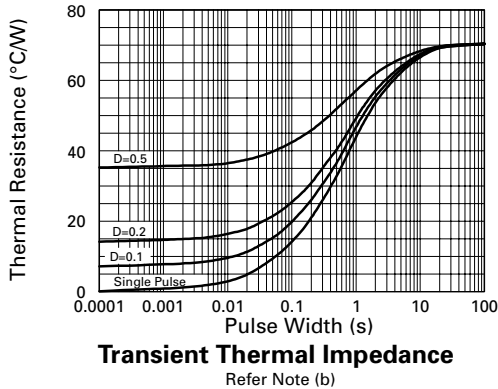
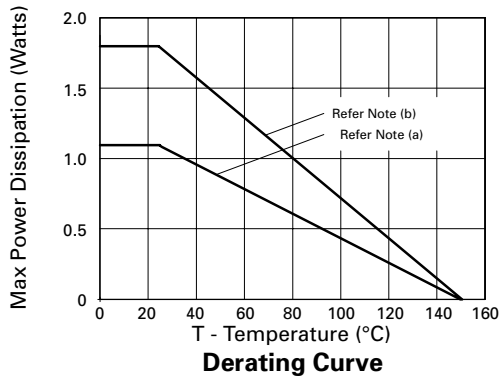
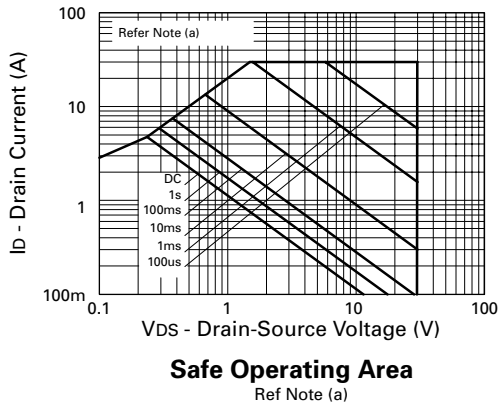
NOTES

(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 $t \leq 10$ secs.

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

CHARACTERISTICS



ZXM64N03X

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

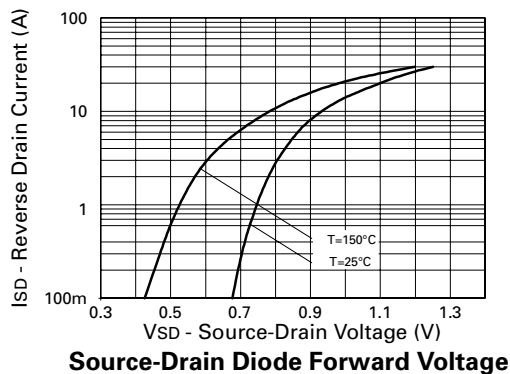
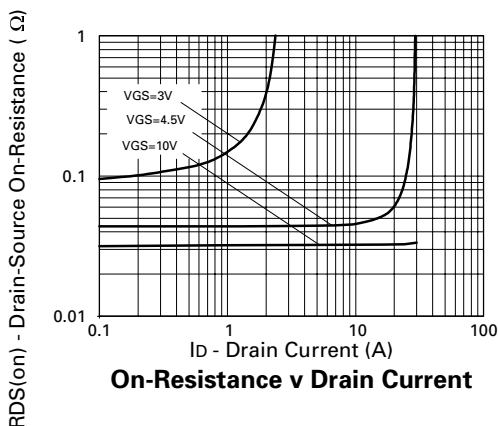
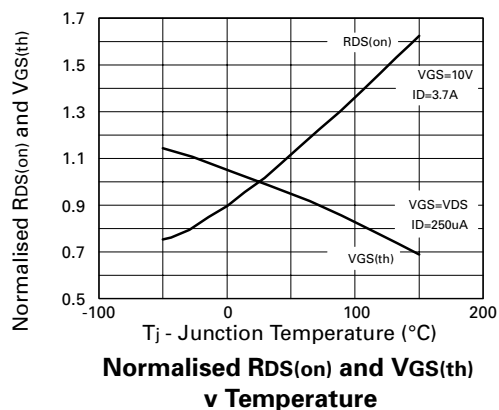
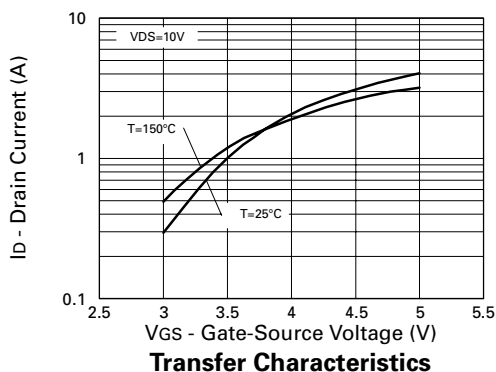
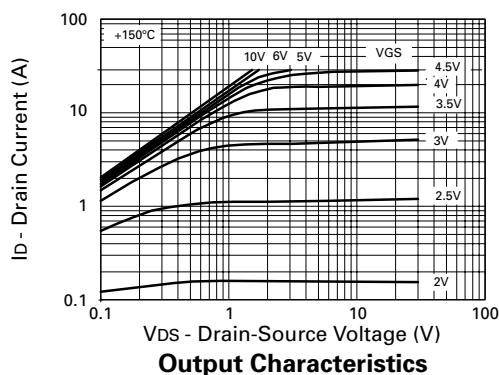
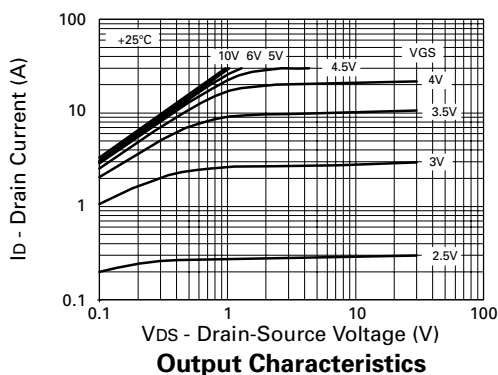
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30			V	$I_D=250\mu A$, $V_{GS}=0V$
Zero Gate Voltage Drain Current	I_{DSS}			1	μA	$V_{DS}=30V$, $V_{GS}=0V$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 20V$, $V_{DS}=0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			V	$I_D=250\mu A$, $V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.045 0.060	Ω Ω	$V_{GS}=10V$, $I_D=3.7A$ $V_{GS}=4.5V$, $I_D=1.9A$
Forward Transconductance (3)	g_{fs}	4.3			S	$V_{DS}=10V$, $I_D=1.9A$
DYNAMIC (3)						
Input Capacitance	C_{iss}		950		pF	$V_{DS}=25V$, $V_{GS}=0V$, $f=1MHz$
Output Capacitance	C_{oss}		200		pF	
Reverse Transfer Capacitance	C_{rss}		50		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		4.2		ns	$V_{DD}=5V$, $I_D=3.7A$ $R_G=6.2\Omega$, $R_D=4.0\Omega$ (Refer to test circuit)
Rise Time	t_r		4.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		20.5		ns	
Fall Time	t_f		8		ns	
Total Gate Charge	Q_g			27	nC	$V_{DS}=24V$, $V_{GS}=10V$, $I_D=3.7A$ (Refer to test circuit)
Gate-Source Charge	Q_{gs}			5	nC	
Gate Drain Charge	Q_{gd}			4.5	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			0.95	V	$T_j=25^{\circ}C$, $I_S=3.7A$, $V_{GS}=0V$
Reverse Recovery Time (3)	t_{rr}		24.5		ns	$T_j=25^{\circ}C$, $I_F=3.7A$, $di/dt= 100A/\mu s$
Reverse Recovery Charge(3)	Q_{rr}		19.1		nC	

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

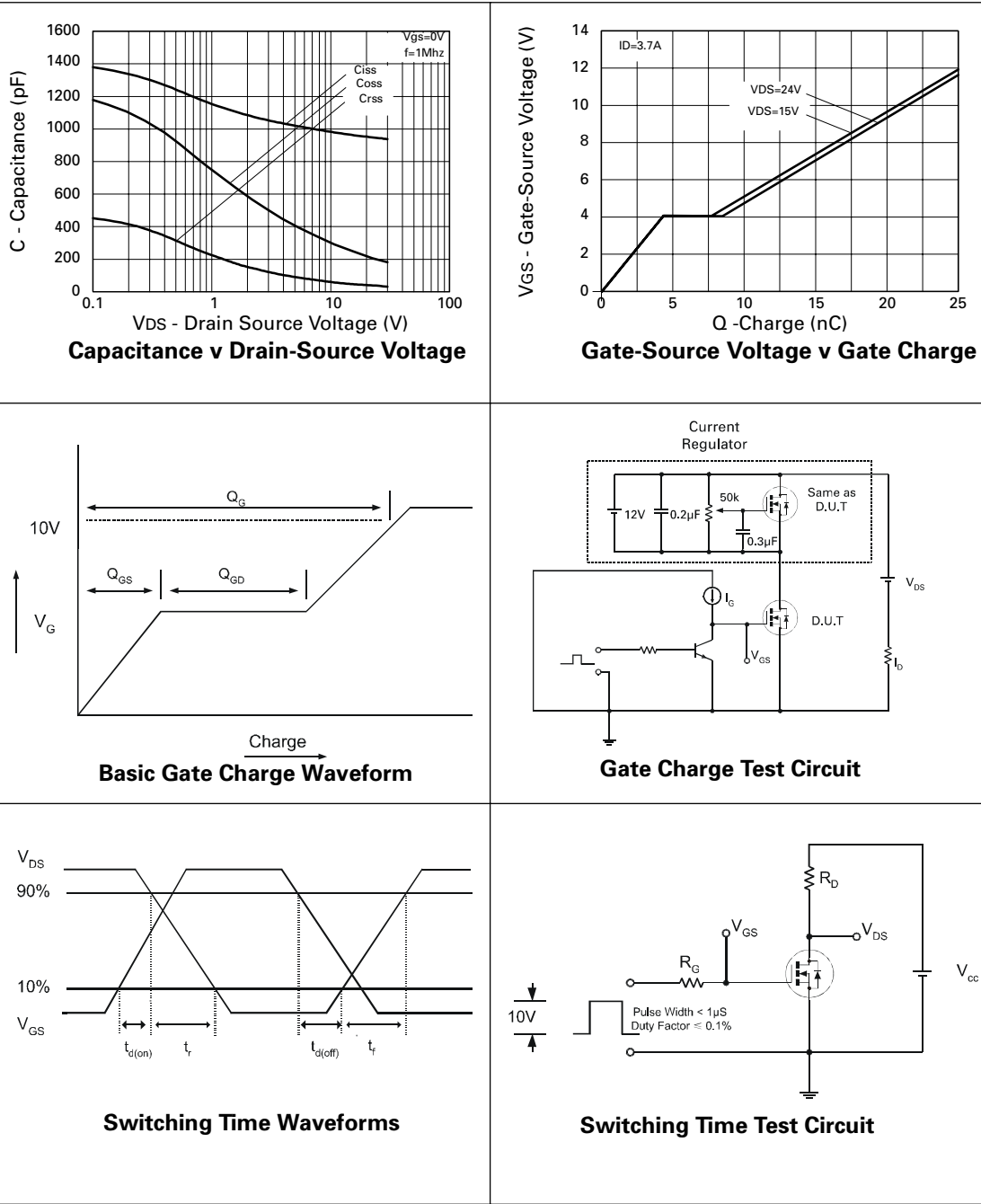
(2) Switching characteristics are independent of operating junction temperature.

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

TYPICAL CHARACTERISTICS



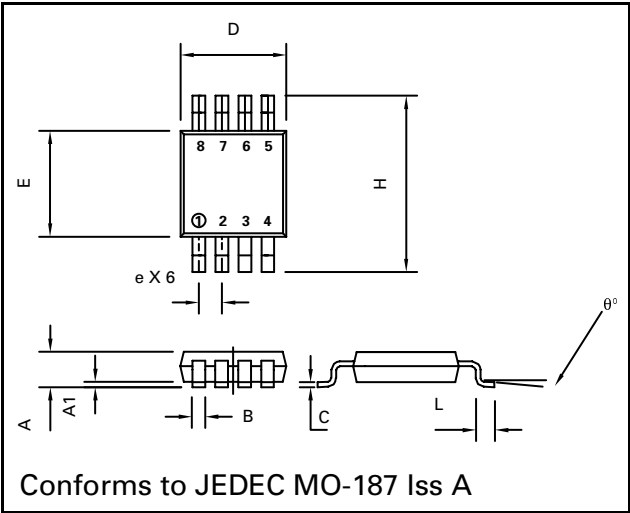
TYPICAL CHARACTERISTICS



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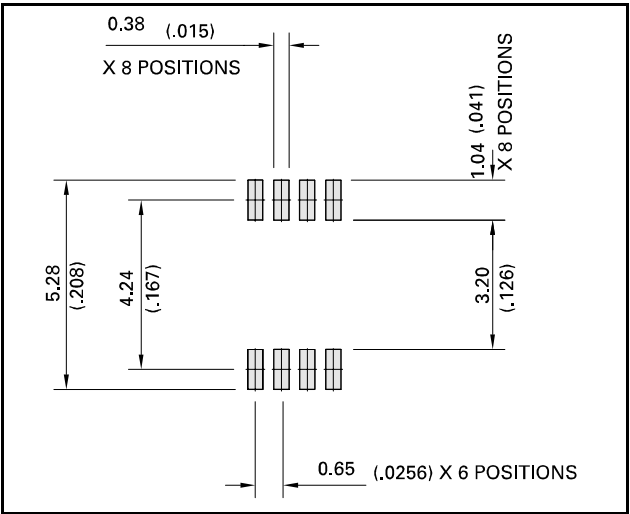
ZXM64N03X

PACKAGE DIMENSIONS



DIM	Millimetres		Inches	
	MIN	MAX	MIN	MAX
A		1.10		0.043
A1	0.05	0.15	0.002	0.006
B	0.25	0.40	0.010	0.016
C	0.13	0.23	0.005	0.009
D	2.90	3.10	0.114	0.122
e	0.65	BSC	0.0256	BSC
E	2.90	3.10	0.114	0.122
H	4.90	BSC	0.193	BSC
L	0.40	0.70	0.016	0.028
q°	0°	6°	0°	6°

PAD LAYOUT DETAILS



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