

20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}=20V$; $R_{DS(ON)}=0.040\Omega$; $I_D=5.4A$

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
- Low profile SOIC package

APPLICATIONS

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

ORDERING INFORMATION

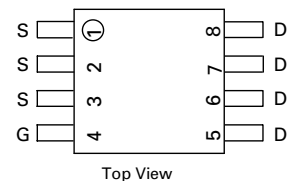
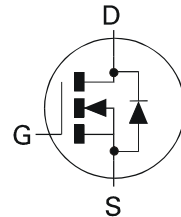
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXM64N02XTA	7	12mm embossed	1000 units
ZXM64N02XTC	13	12mm embossed	4000 units

DEVICE MARKING

- ZXM4N02



MSOP8



ZXM64N02X

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	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	5.4 4.3	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	$^\circ C/W$

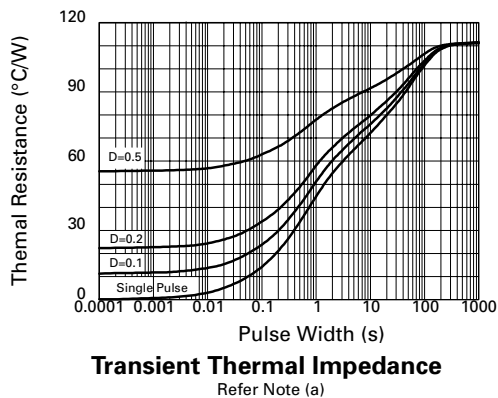
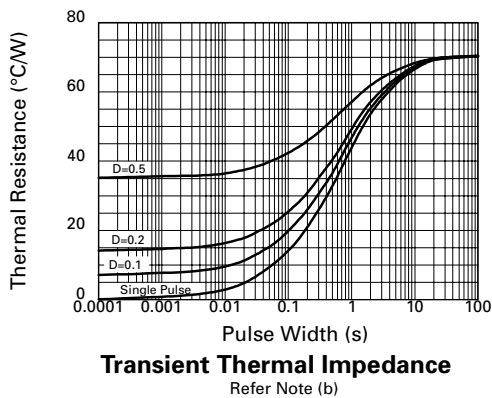
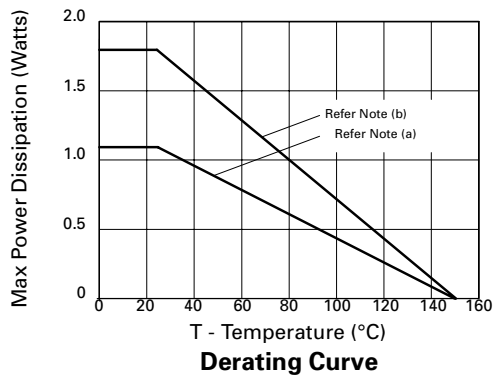
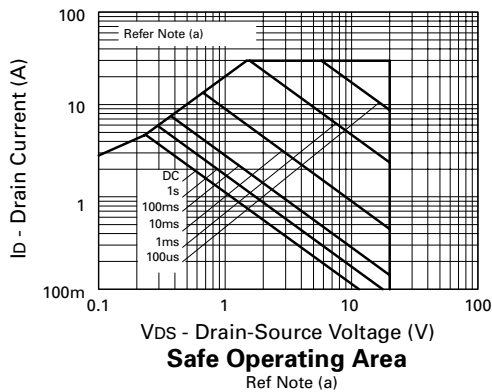
NOTES

(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.

TYPICAL CHARACTERISTICS



ZXM64N02X

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

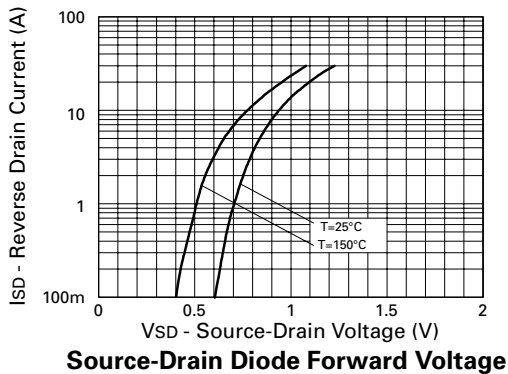
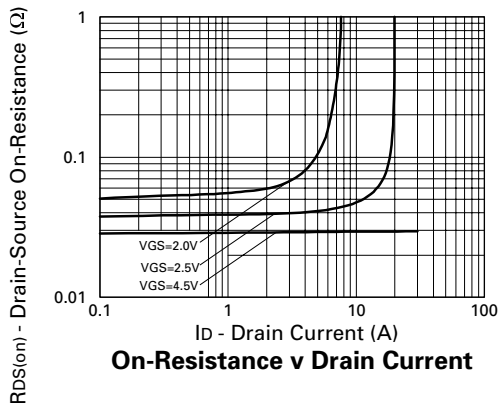
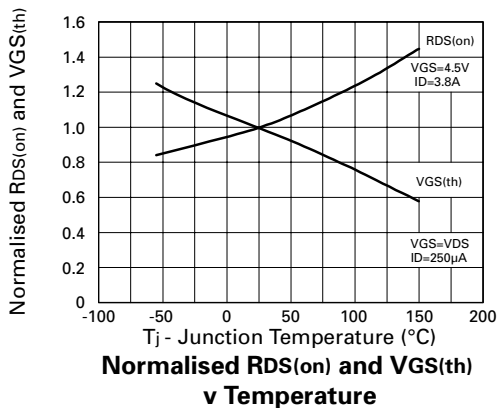
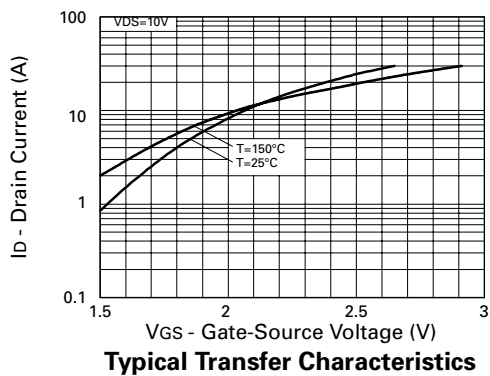
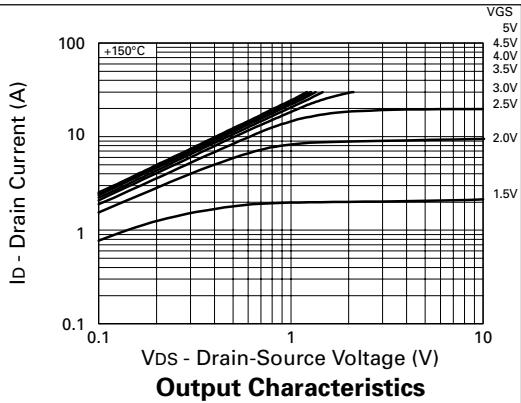
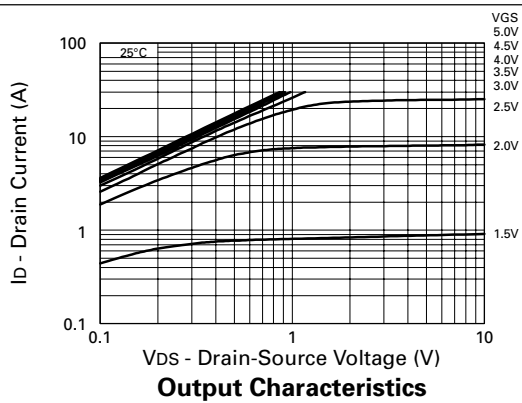
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	20			V	I _D =250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =20V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =± 12V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	0.7			V	I _D =250μA, V _{DS} = V _{GS}
Static Drain-Source On-State Resistance (1)	R _{DS(on)}			0.040 0.050	Ω Ω	V _{GS} =4.5V, I _D =3.8A V _{GS} =2.7V, I _D =1.9A
Forward Transconductance (3)	g _{fs}	6.1			S	V _{DS} =10V, I _D =1.9A
DYNAMIC (3)						
Input Capacitance	C _{iss}		1100		pF	V _{DS} =15 V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{Oss}		350		pF	
Reverse Transfer Capacitance	C _{rss}		100		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t _{d(on)}		5.7		ns	V _{DD} =10V, I _D =3.8A R _G =6.2Ω, R _D =2.6Ω (Refer to test circuit)
Rise Time	t _r		9.6		ns	
Turn-Off Delay Time	t _{d(off)}		28.3		ns	
Fall Time	t _f		11.6		ns	
Total Gate Charge	Q _g			16	nC	V _{DS} =16V, V _{GS} =4.5V, I _D =3.8A (Refer to test circuit)
Gate-Source Charge	Q _{gs}			3.5	nC	
Gate Drain Charge	Q _{gd}			5.4	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V _{SD}			0.95	V	T _j =25°C, I _S =3.8A, V _{GS} =0V
Reverse Recovery Time (3)	t _{rr}		23.7		ns	T _j =25°C, I _F =3.8A, di/dt= 100A/μs
Reverse Recovery Charge(3)	Q _{rr}		13.3		nC	

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

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

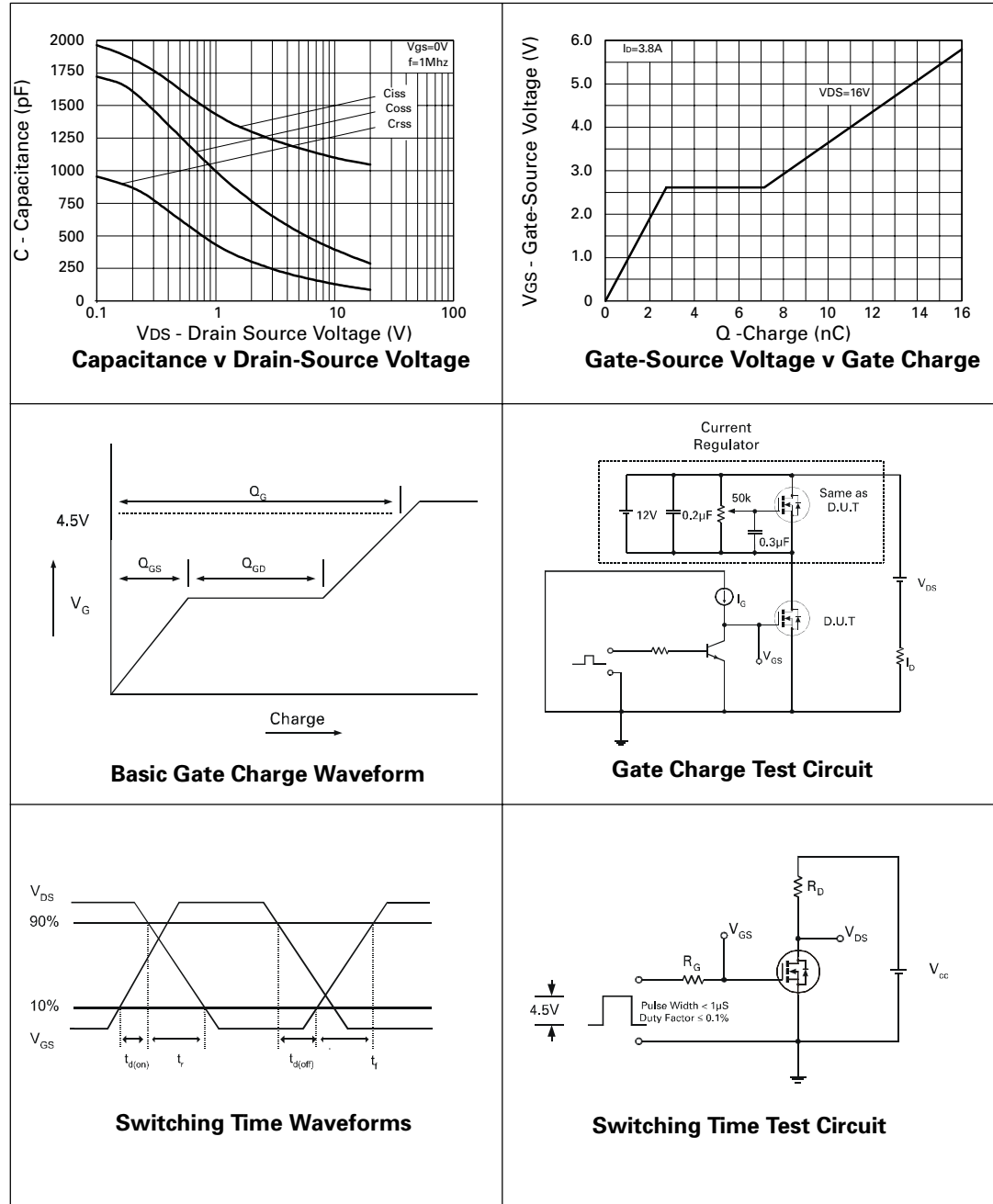
(3) For design aid only, not subject to production testing.

TYPICAL CHARACTERISTICS



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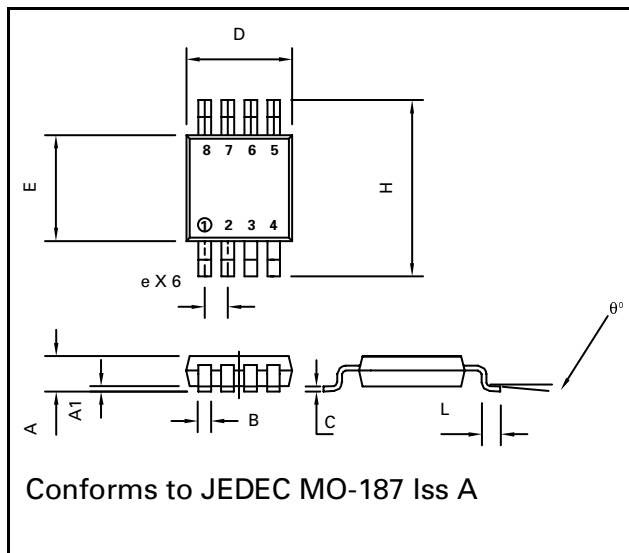
TYPICAL CHARACTERISTICS



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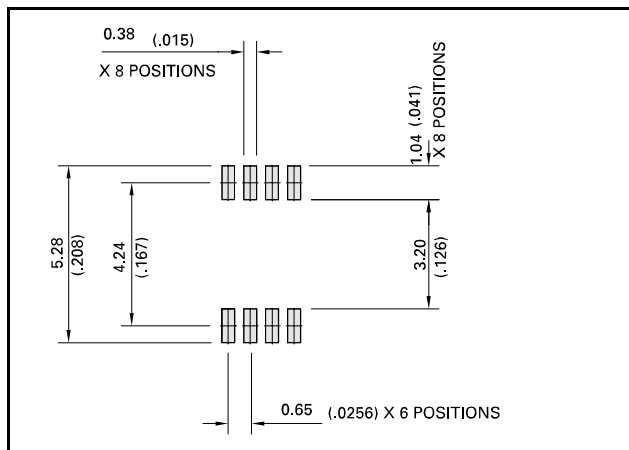
ZXM64N02X

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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