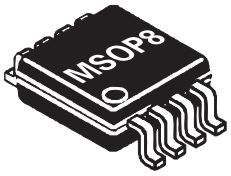
ZXMN3A02X8

30V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}$=30V; $R_{DS(ON)}$=0.025Ω I_D=6.7A

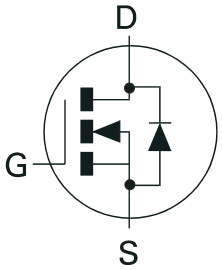


DESCRIPTION

This new generation of TRENCH 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

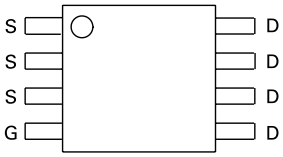


APPLICATIONS

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

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A02X8TA	7″	12mm	1000 units
ZXMN3A02X8TC	13″	12mm	4000 units



Top View

DEVICE MARKING

- ZXMN
  3A02

ZXMN3A02X8

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) V_{GS}=10V; T_A=25°C (a)	I_D	6.7 5.4 5.3	A
Pulsed Drain Current (c)	I_{DM}	24	A
Continuous Source Current (Body Diode) (b)	I_S	3.2	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	24	A
Power Dissipation at T_A=25°C (a) Linear Derating Factor	P_D	1.1 8.8	W mW/°C
Power Dissipation at T_A=25°C (b) Linear Derating Factor	P_D	1.8 14.4	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)	$R_{\theta JA}$	113	°C/W
Junction to Ambient (b)	$R_{\theta JA}$	70	°C/W

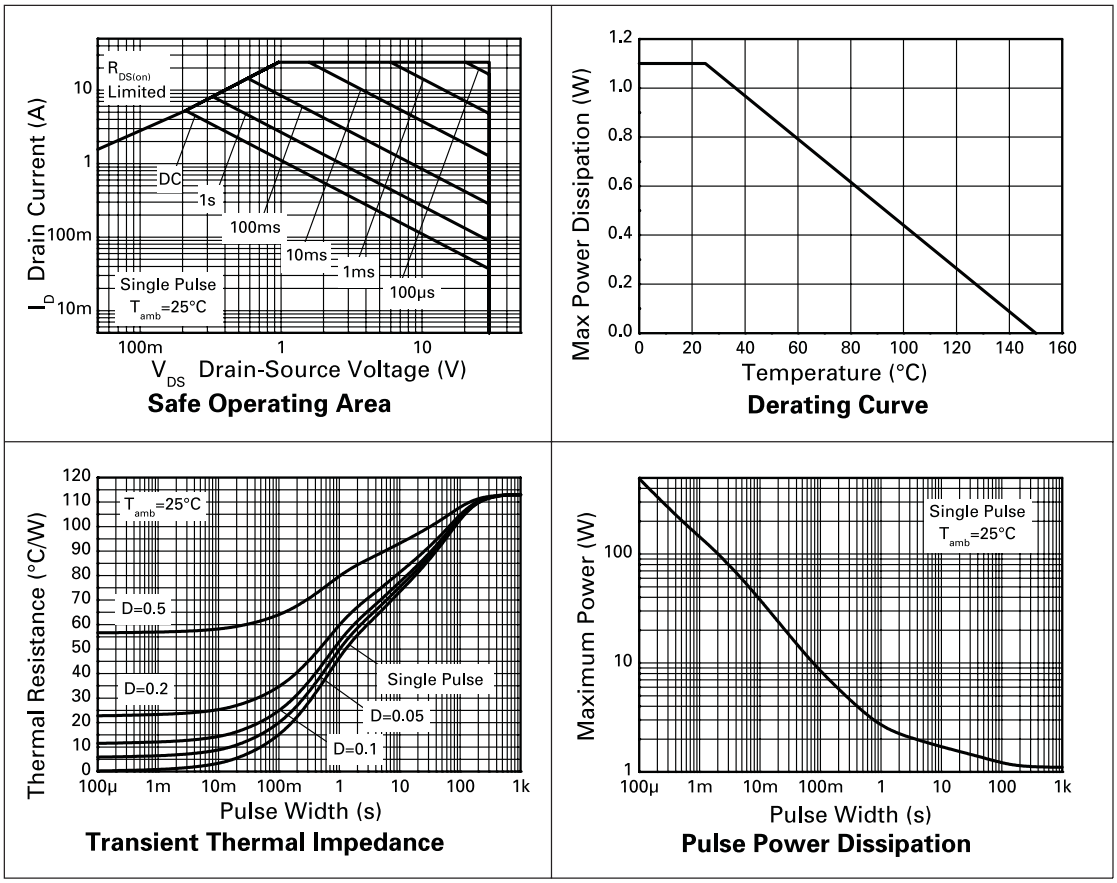
NOTES

(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 10μs - pulse width limited by maximum junction temperature.

CHARACTERISTICS



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

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			V	I_D=250μA, V_{DS}= V_{GS}
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.025 0.035	Ω Ω	V_{GS}=10V, I_D=12A V_{GS}=4.5V, I_D=10.2A
Forward Transconductance (1)(3)	g_{fs}		22		S	V_{DS}=10V,I_D=12A
DYNAMIC (3)						
Input Capacitance	C_{iss}		1400		pF	V_{DS}=25 V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		209		pF	
Reverse Transfer Capacitance	C_{rss}		120		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		3.9		ns	V_{DD} =15V, I_D=5.5A R_G=6.2Ω, V_{GS}=10V (refer to test circuit)
Rise Time	t_r		5.5		ns	
Turn-Off Delay Time	$t_{d(off)}$		35.0		ns	
Fall Time	t_f		7.6		ns	
Gate Charge	Q_g		14.5		nC	V_{DS}=15V,V_{GS}=5V, I_D=5.5A (refer to test circuit)
Total Gate Charge	Q_g		26.8		nC	V_{DS}=15V,V_{GS}=10V, I_D=5.5A (refer to test circuit)
Gate-Source Charge	Q_{gs}		4.7		nC	
Gate-Drain Charge	Q_{gd}		4.7		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}			0.95	V	T_J=25°C, I_S=9A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		17		ns	T_J=25°C, I_F=5.5A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		8.3		nC	

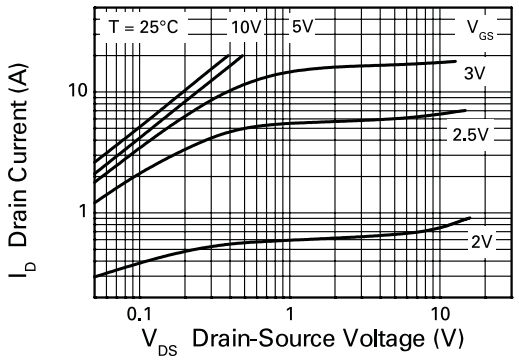
NOTES

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

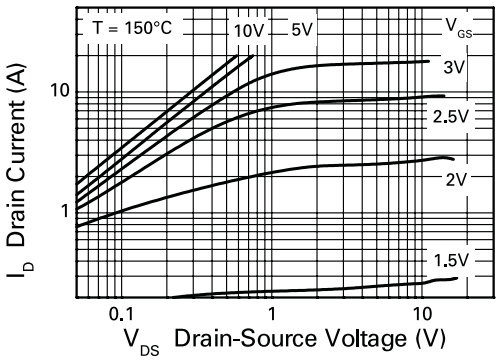
(2) Switching characteristics are independent of operating junction temperature.

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

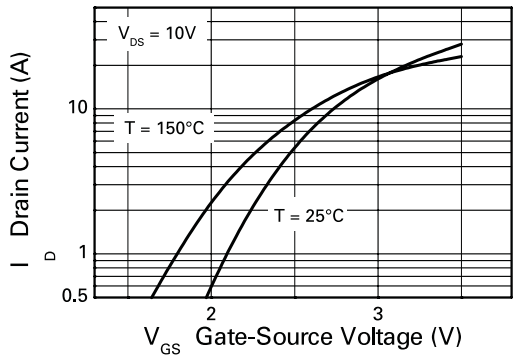
CHARACTERISTICS



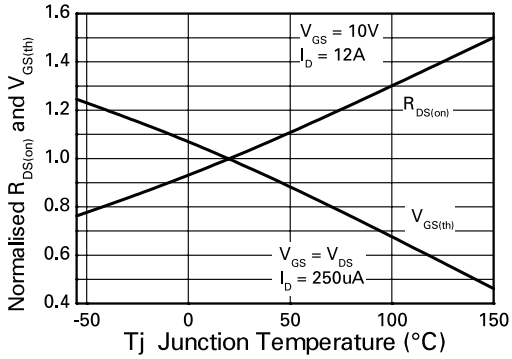
Output Characteristics



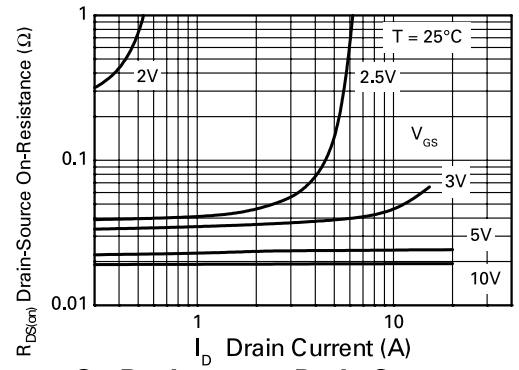
Output Characteristics



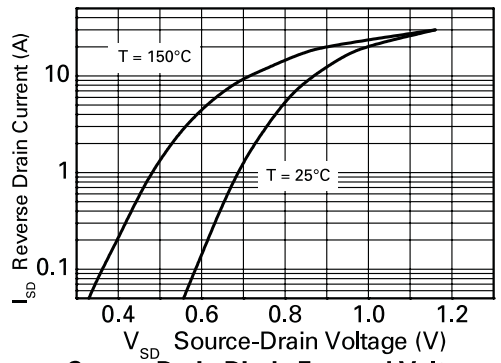
Typical Transfer Characteristics



Normalised Curves v Temperature

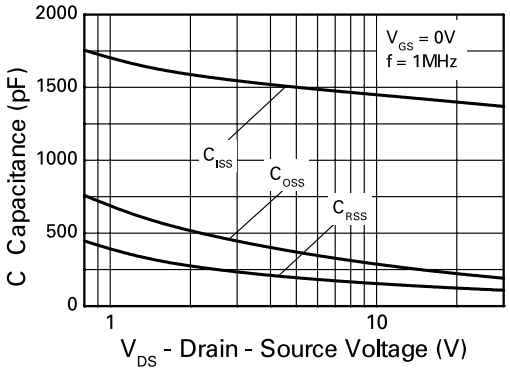


On-Resistance v Drain Current

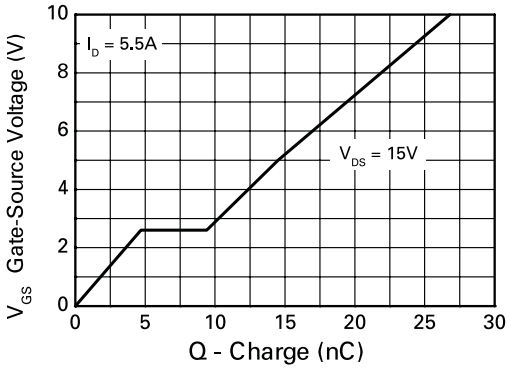


Source-Drain Diode Forward Voltage

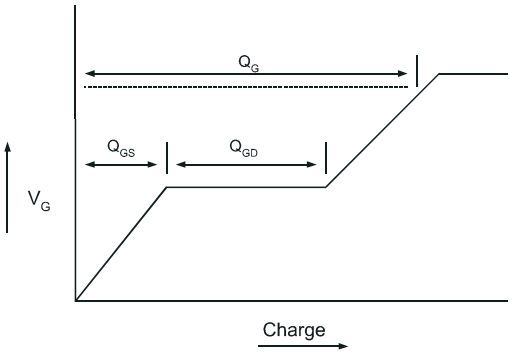
CHARACTERISTICS



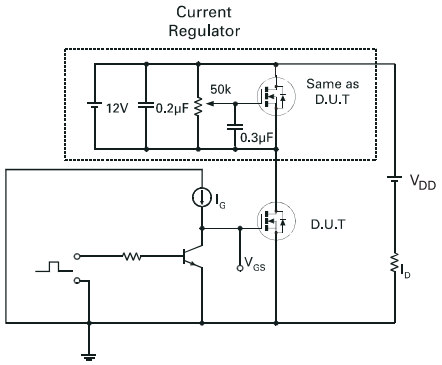
Capacitance v Drain-Source Voltage



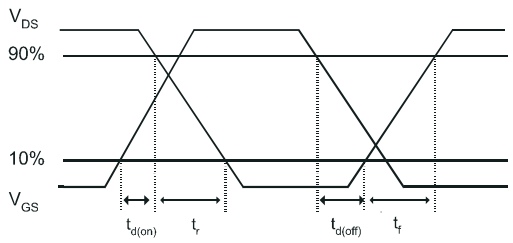
Gate-Source Voltage v Gate Charge



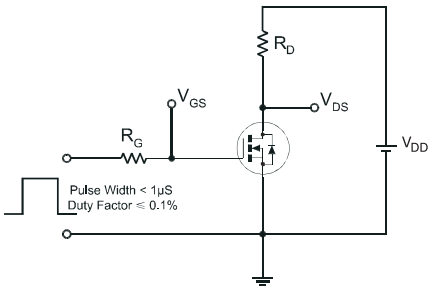
Basic Gate Charge Waveform



Gate Charge Test Circuit

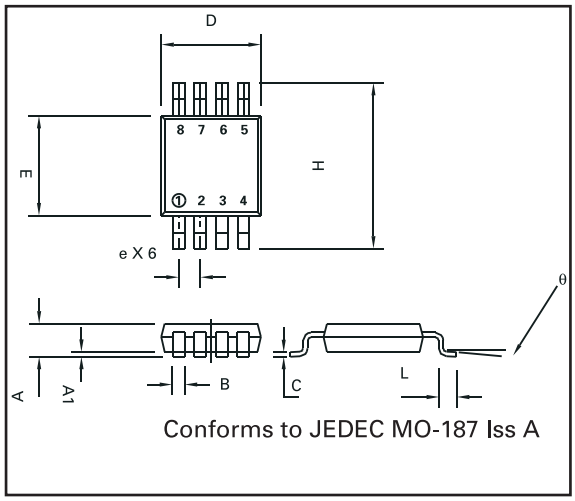


Switching Time Waveforms



Switching Time Test Circuit

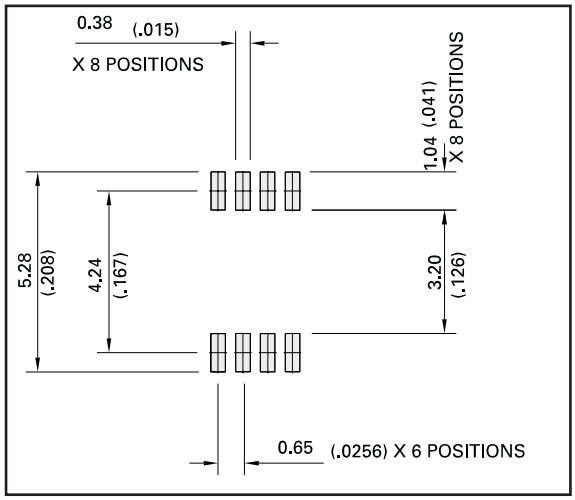
PACKAGE OUTLINE



PACKAGE DIMENSION

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
θ°	0°	6°	0°	6°

PAD LAYOUT



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