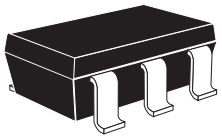
ZXMN2A01E6

20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY
$V_{(BR)DSS}$ = 20V; $R_{DS(ON)}$ = 0.12Ω; I_D = 3.1A

DESCRIPTION

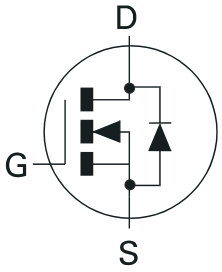
This new generation of trench MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



SOT23-6

FEATURES

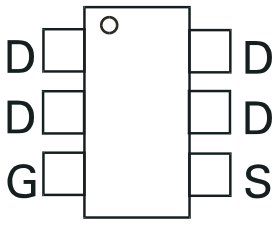
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23-6 package



APPLICATIONS

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

PINOUT



Top View

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN2A01E6TA	7″	8mm	3000 units
ZXMN2A01E6TC	13″	8mm	10000 units

DEVICE MARKING

- 2A1

ZXMN2A01E6

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}=10V; T_A=25°C (b) V_{GS}=10V; T_A=70°C (b) V_{GS}=10V; T_A=25°C (a)	I_D	3.1 2.5 2.5	A
Pulsed Drain Current (c)	I_{DM}	11	A
Continuous Source Current (Body Diode) (b)	I_S	2.4	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	11	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	1.7 13.6	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

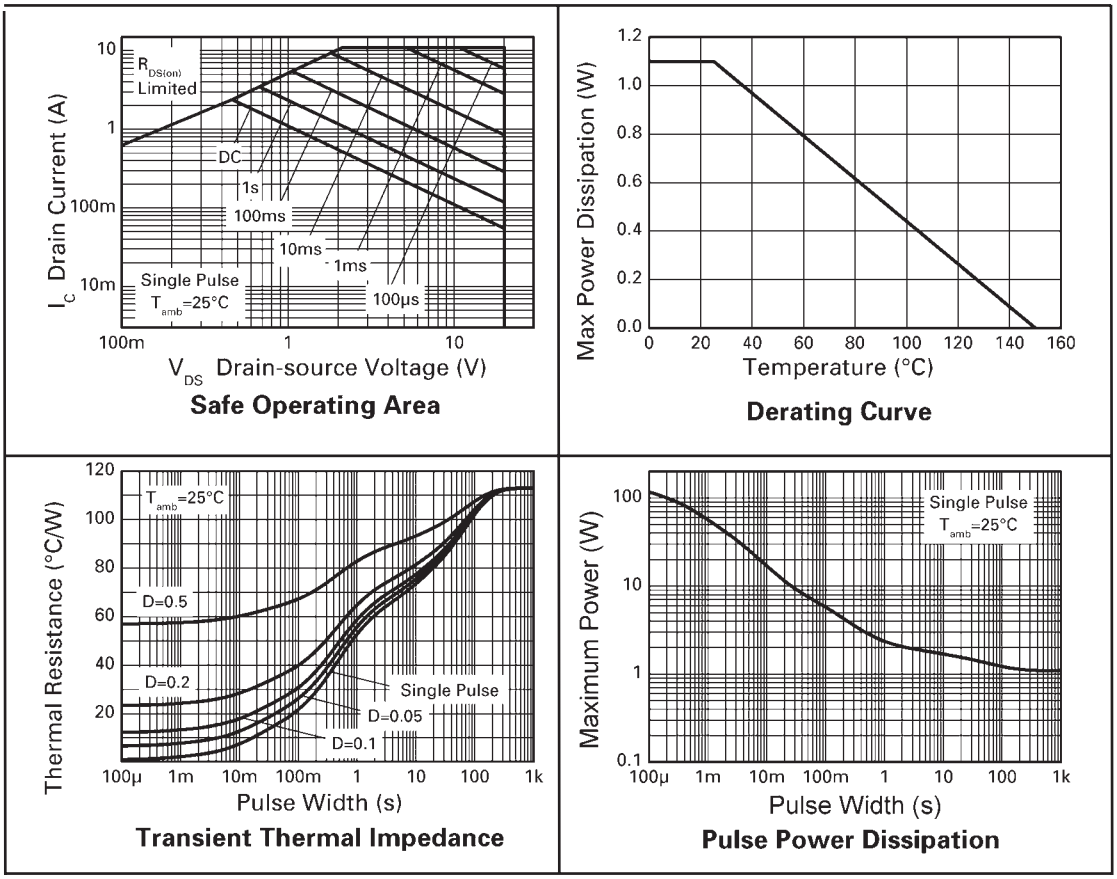
NOTES

(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. Refer to Transient Thermal Impedance graph.

CHARACTERISTICS



ZXMN2A01E6

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	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)	$R_{DS(on)}$			0.12 0.225	Ω Ω	V_{GS}=4.5V, I_D=4A V_{GS}=2.5V, I_D=1.5A
Forward Transconductance (1)(3)	g_{fs}		6.1		S	V_{DS}=10V,I_D=4A
DYNAMIC (3)						
Input Capacitance	C_{iss}		303		pF	V_{DS}=15 V, V_{GS}=0V, f=1MHz
Output Capacitance	C_{oss}		59		pF	
Reverse Transfer Capacitance	C_{rss}		30		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		2.49		ns	V_{DD} =10V, I_D=4A R_G=6.0Ω, V_{GS}=5V
Rise Time	t_r		5.21		ns	
Turn-Off Delay Time	$t_{d(off)}$		7.47		ns	
Fall Time	t_f		4.62		ns	
Total Gate Charge	Q_g		3.0		nC	V_{DS}=10V,V_{GS}=4.5V, I_D=4A
Gate-Source Charge	Q_{gs}		0.8		nC	
Gate-Drain Charge	Q_{gd}		1.0		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}		0.9	0.95	V	T_J=25°C, I_S=3.2A, V_{GS}=0V
Reverse Recovery Time (3)	t_{rr}		23		ns	T_J=25°C, I_F= 4A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q_{rr}		5.65		nC	

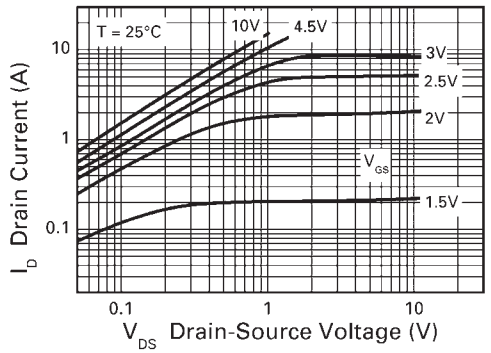
NOTES:

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

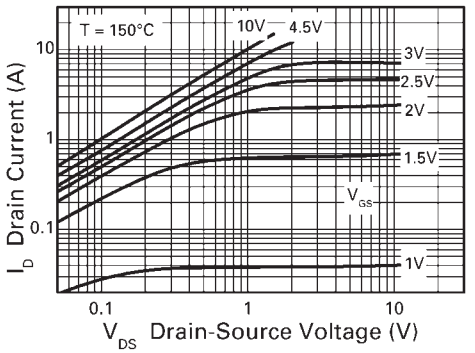
(2) Switching characteristics are independent of operating junction temperature.

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

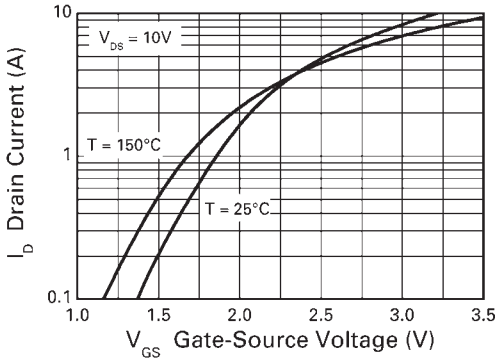
TYPICAL CHARACTERISTICS



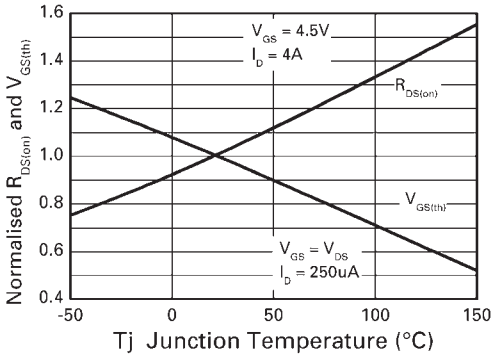
Output Characteristics



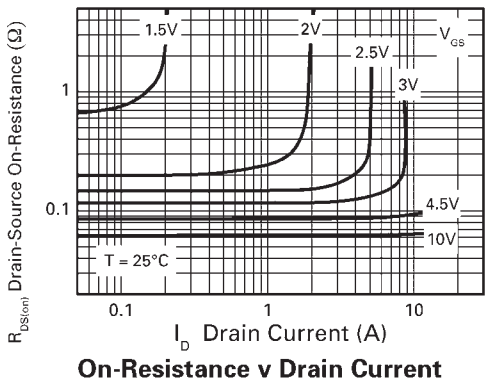
Output Characteristics



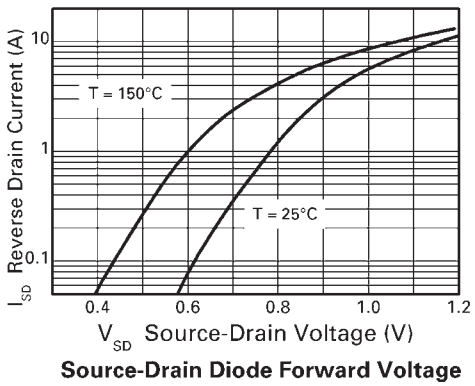
Typical Transfer Characteristics



Normalised Curves v Temperature

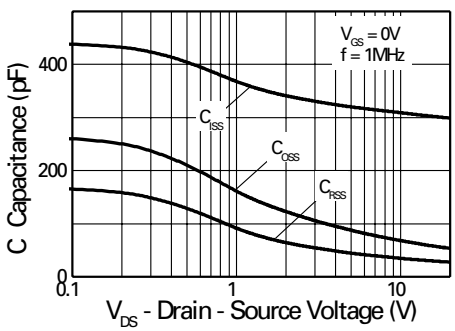


On-Resistance v Drain Current

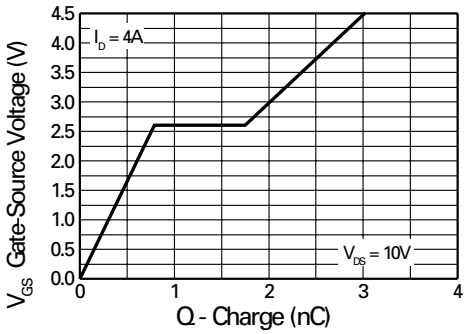


Source-Drain Diode Forward Voltage

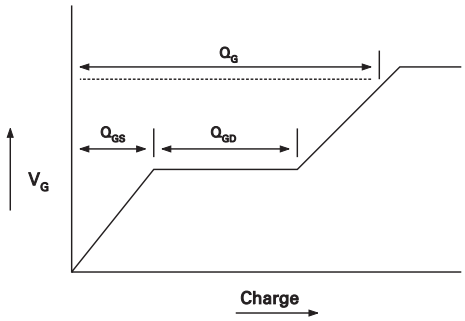
TYPICAL CHARACTERISTICS



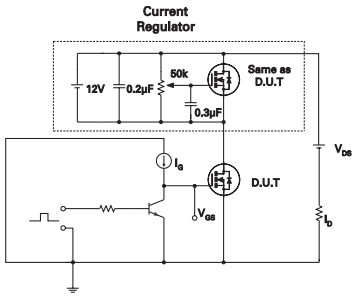
Capacitance v Drain-Source Voltage



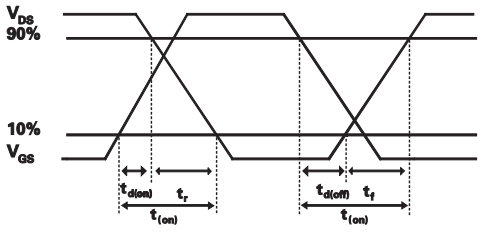
Gate-Source Voltage v Gate Charge



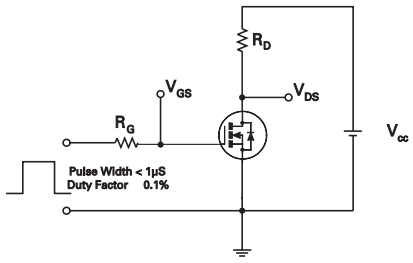
Basic Gate Charge Waveform



Gate Charge Test Circuit

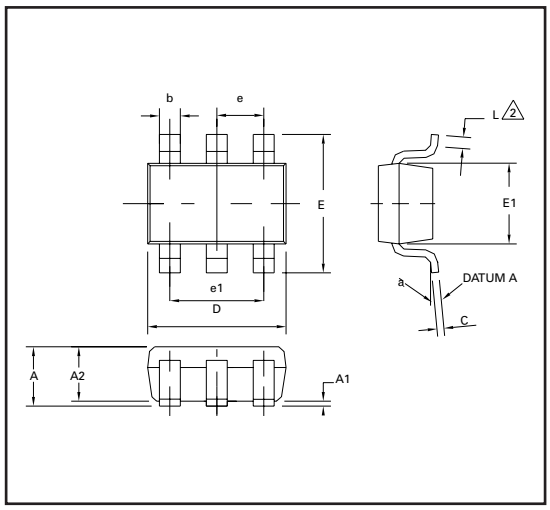


Switching Time Waveforms

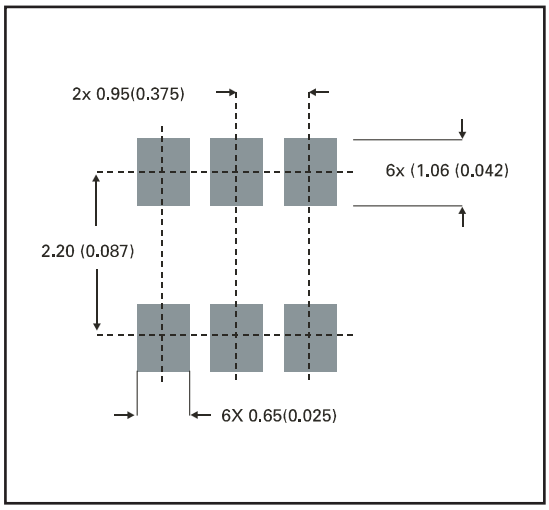


Switching Time Test Circuit

PACKAGE OUTLINE



PAD LAYOUT DETAILS



CONTROLLING DIMENSIONS IN MILLIMETERS APPROX CONVERSIONS INCHES

PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.90	1.45	0.35	0.057	E	2.60	3.00	0.102	0.118
A1	0.00	0.15	0	0.006	E1	1.50	1.75	0.059	0.069
A2	0.90	1.30	0.035	0.051	L	0.10	0.60	0.004	0.002
b	0.35	0.50	0.014	0.019	e	0.95 REF		0.037 REF	
C	0.09	0.20	0.0035	0.008	e1	1.90 REF		0.074 REF	
D	2.80	3.00	0.110	0.118	L	0°	10°	0°	10°

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ISSUE 3 - FEBRUARY 2006

ZETEX SEMICONDUCTORS