

ZXMN2A01E6

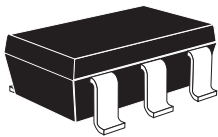
20V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

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

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.



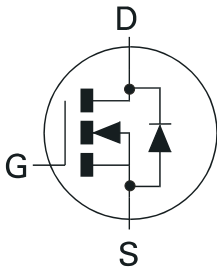
SOT23-6

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



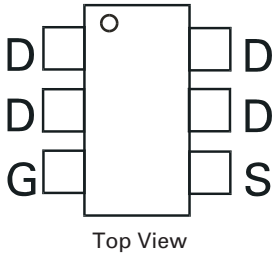
ORDERING INFORMATION

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

DEVICE MARKING

- 2A1

PINOUT



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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate Source Voltage	V_{GS}	± 12	V
Continuous Drain Current $V_{GS}=10V$; $T_A=25^\circ C$ (b) $V_{GS}=10V$; $T_A=70^\circ C$ (b) $V_{GS}=10V$; $T_A=25^\circ C$ (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 $T_A=25^\circ C$ (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	1.7 13.6	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

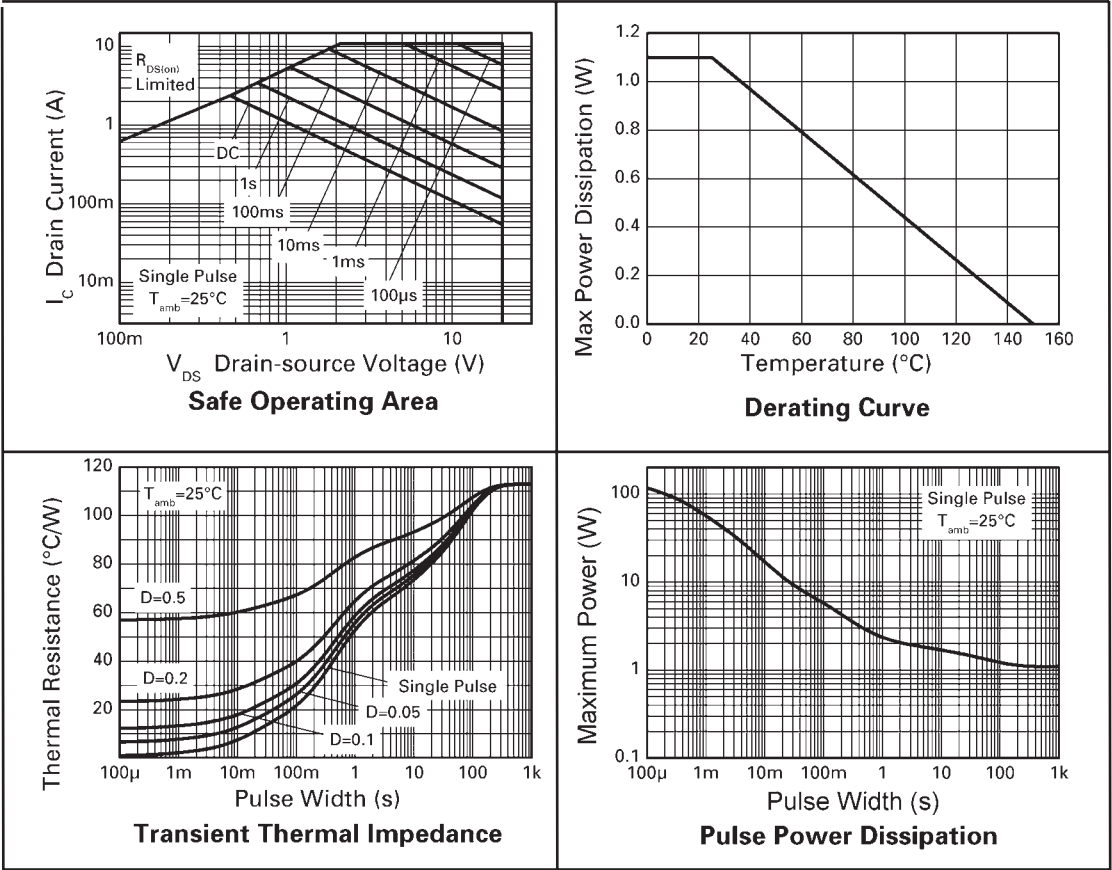
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

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

(c) Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.05$, pulse width $10 \mu s$ - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

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CHARACTERISTICS



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ELECTRICAL CHARACTERISTICS (at $T_A = 25^\circ\text{C}$ 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)}			0.12 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:

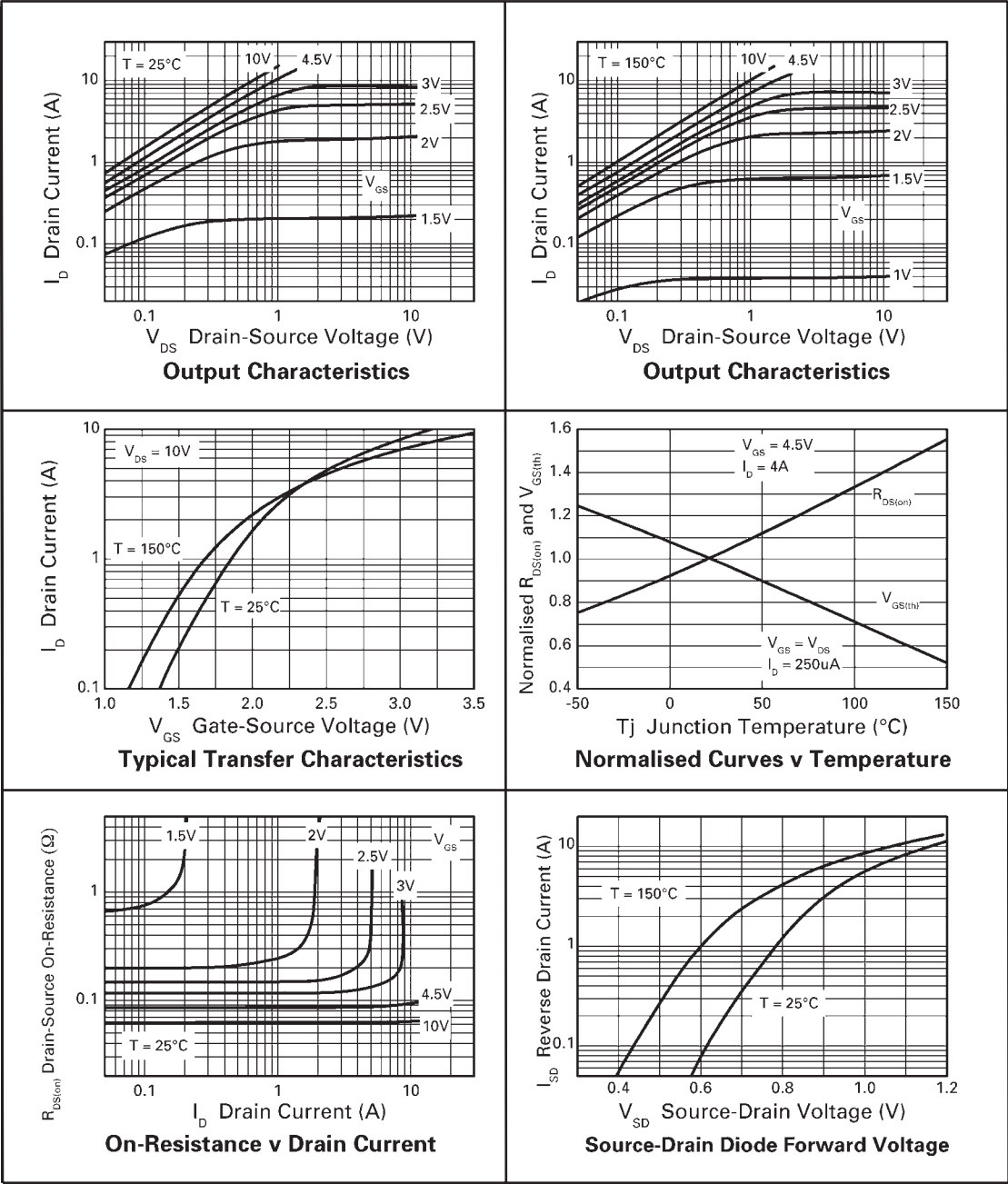
(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.

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

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

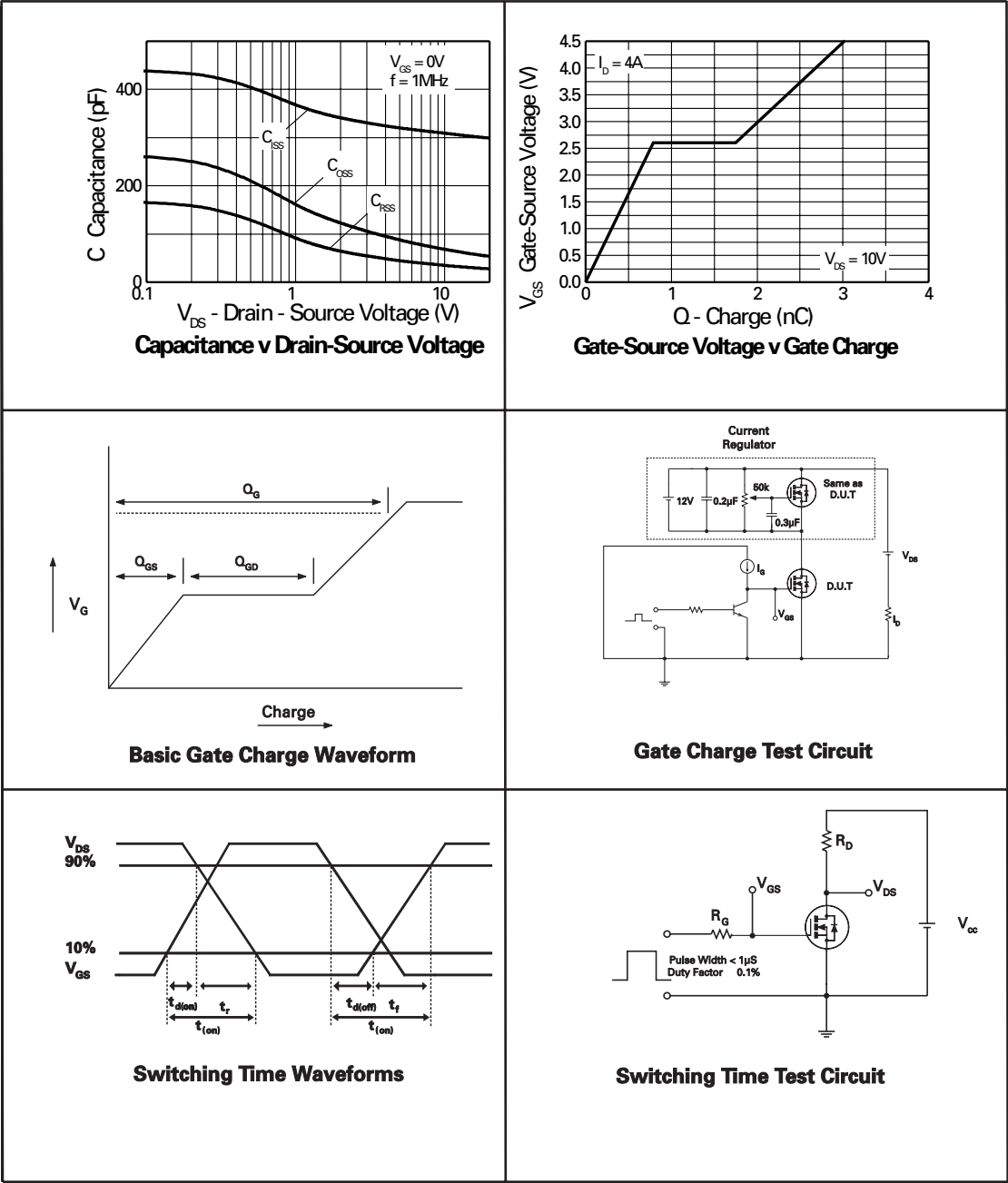
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TYPICAL CHARACTERISTICS



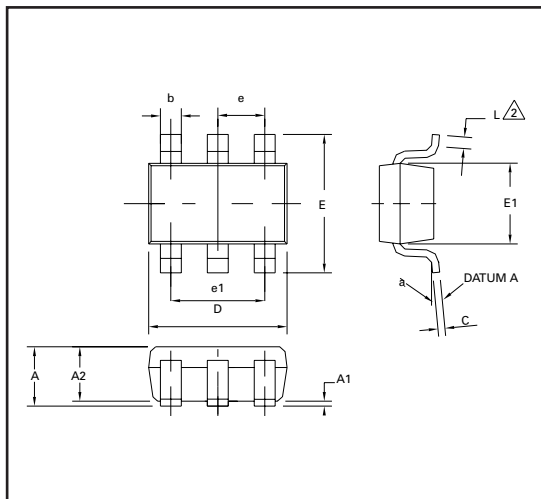
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TYPICAL CHARACTERISTICS

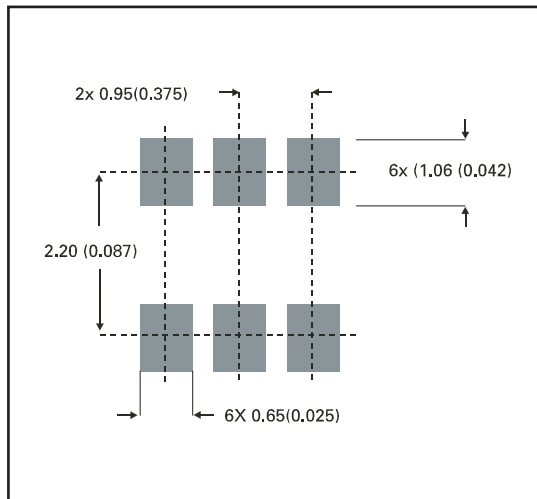


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PACKAGE OUTLINE



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