

ZXMN3A01E6

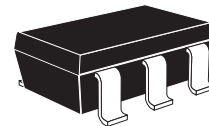
30V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 30V$; $R_{DS(ON)} = 0.12\Omega$ $I_D = 3.0A$

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.



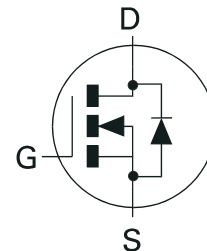
SOT23-6

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



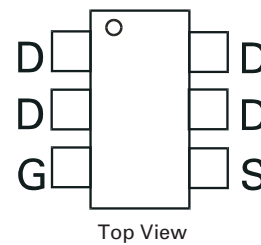
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN3A01E6TA	7"	8mm	3000 units
ZXMN3A01E6TC	13"	8mm	10000 units

DEVICE MARKING

- 3A1

PINOUT



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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) $V_{GS}=10V$; $T_A=25^\circ C$ (a)	I_D	3.0 2.4 2.4	A
Pulsed Drain Current (c)	I_{DM}	10	A
Continuous Source Current (Body Diode) (b)	I_S	2.4	A
Pulsed Source Current (Body Diode) (c)	I_{SM}	10	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 $t \leq 5$ secs.

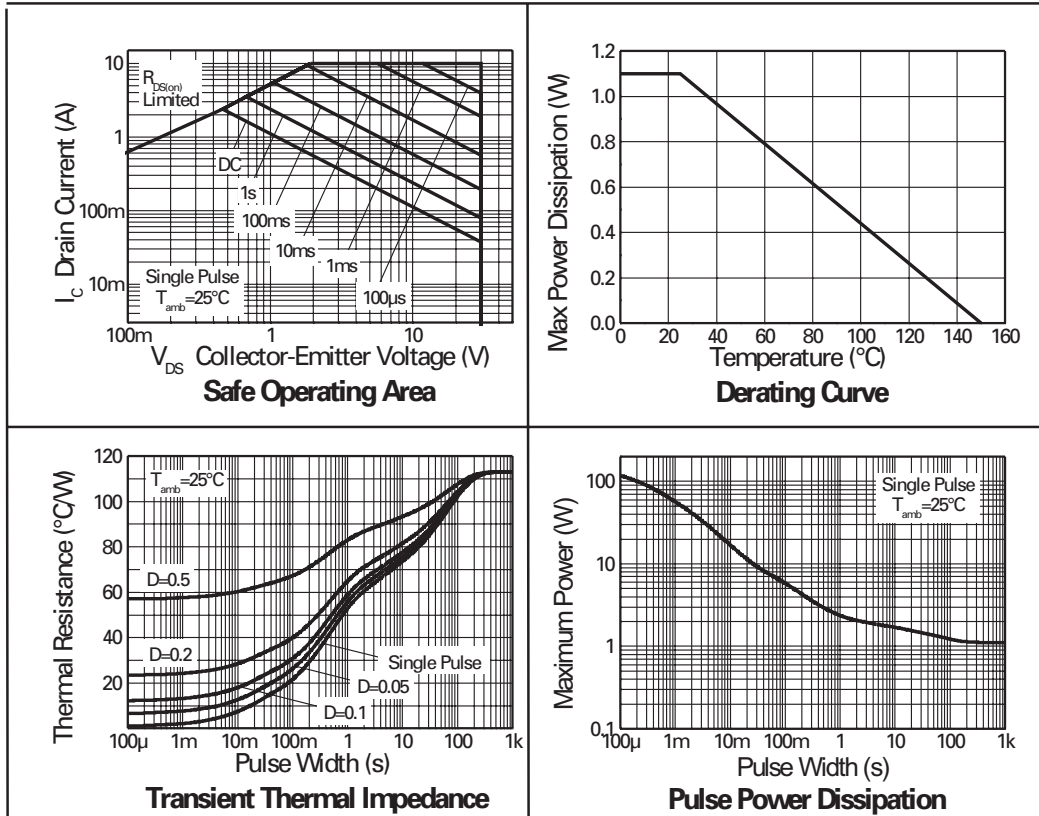
(c) Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.05$, pulse width $10\mu s$ - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.



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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	$V_{(BR)DSS}$	30			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			0.5	μA	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1			V	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$		0.106	0.12 0.18	Ω Ω	$V_{GS}=10\text{V}, I_D=2.5\text{A}$ $V_{GS}=4.5\text{V}, I_D=2.0\text{A}$
Forward Transconductance (1)(3)	g_{fs}		3.5		S	$V_{DS}=4.5\text{V}, I_D=2.5\text{A}$
DYNAMIC (3)						
Input Capacitance	C_{iss}		190		pF	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	C_{oss}		38		pF	
Reverse Transfer Capacitance	C_{rss}		20		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	$t_{d(on)}$		1.7		ns	$V_{DD}=15\text{V}, I_D=2.5\text{A}$ $R_G=6.0\Omega, V_{GS}=10\text{V}$
Rise Time	t_r		2.3		ns	
Turn-Off Delay Time	$t_{d(off)}$		6.6		ns	
Fall Time	t_f		2.9		ns	
Gate Charge	Q_g		2.3		nC	$V_{DS}=15\text{V}, V_{GS}=5\text{V},$ $I_D=2.5\text{A}$
Total Gate Charge	Q_g		3.9		nC	$V_{DS}=15\text{V}, V_{GS}=10\text{V},$ $I_D=2.5\text{A}$
Gate-Source Charge	Q_{gs}		0.6		nC	
Gate-Drain Charge	Q_{gd}		0.9		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V_{SD}		0.84	0.95	V	$T_J=25^\circ\text{C}, I_S=1.7\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	t_{rr}		17.7		ns	$T_J=25^\circ\text{C}, I_F=2.5\text{A},$ $di/dt= 100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	Q_{rr}		13.0		nC	

NOTES

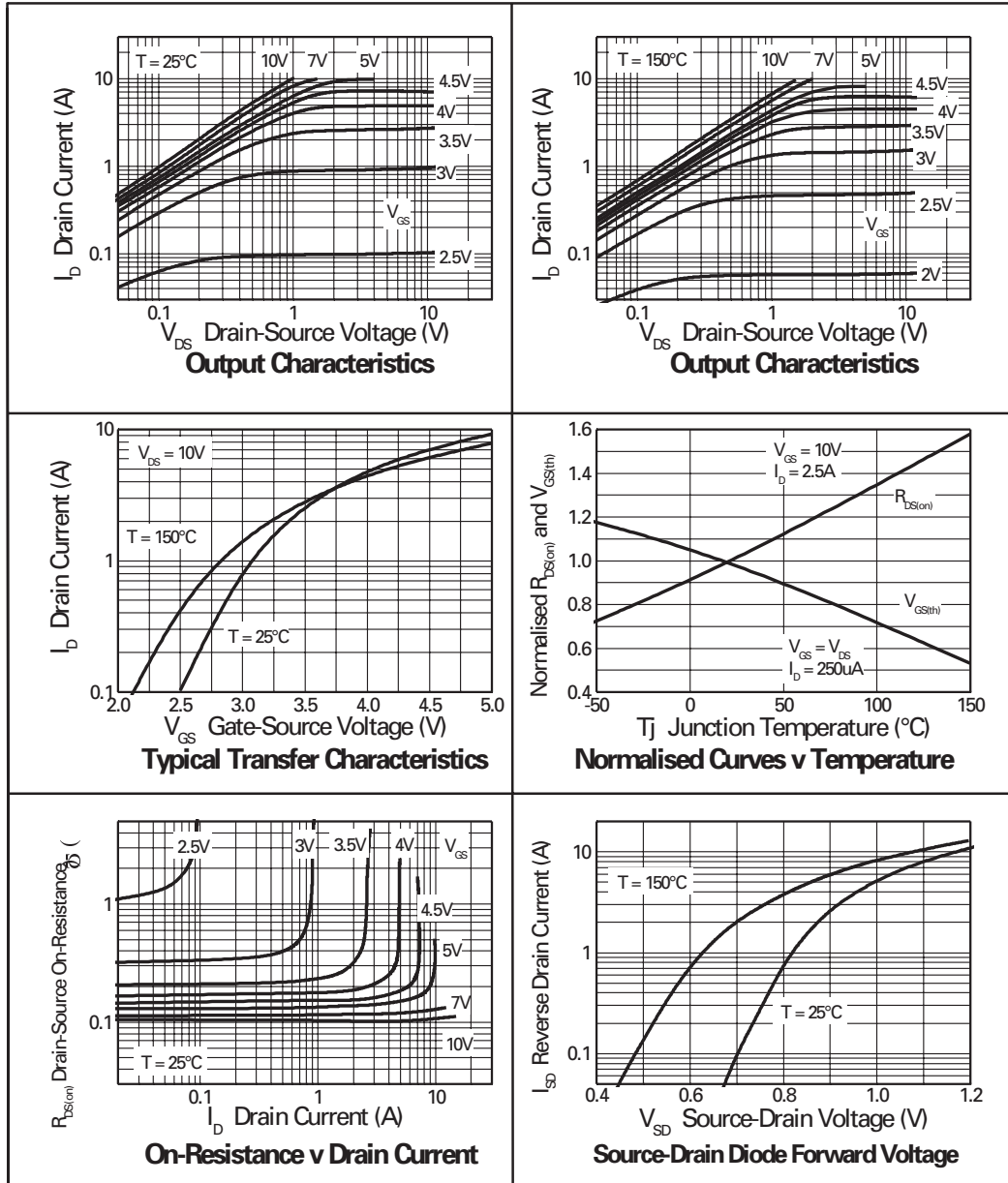
- (1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
 (2) Switching characteristics are independent of operating junction temperature.
 (3) For design aid only, not subject to production testing.



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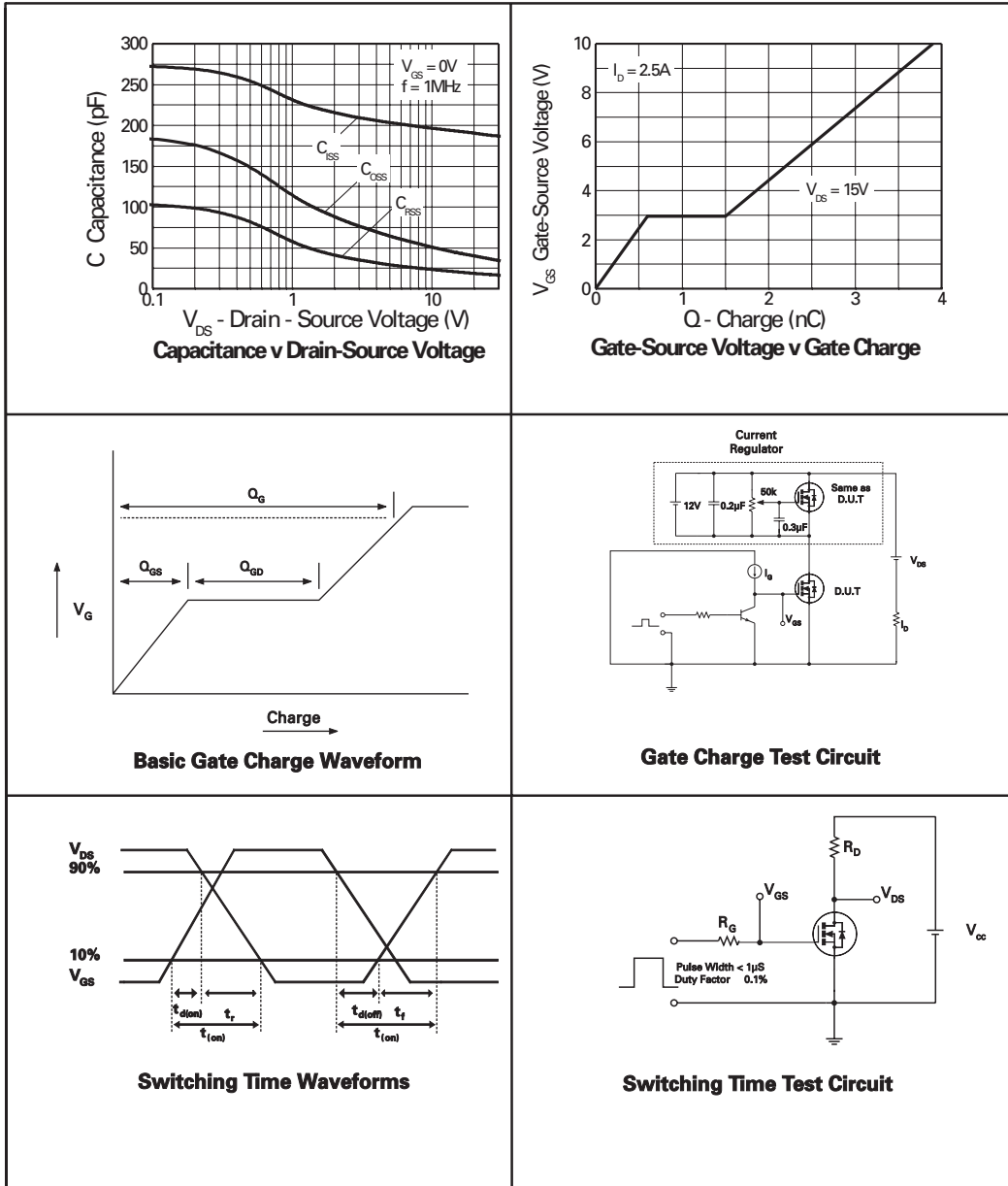
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TYPICAL CHARACTERISTICS



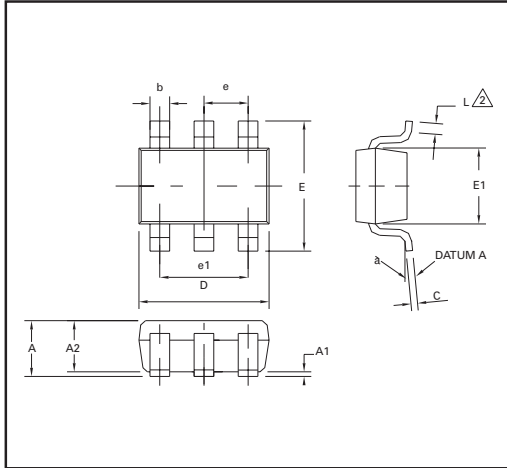
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TYPICAL CHARACTERISTICS

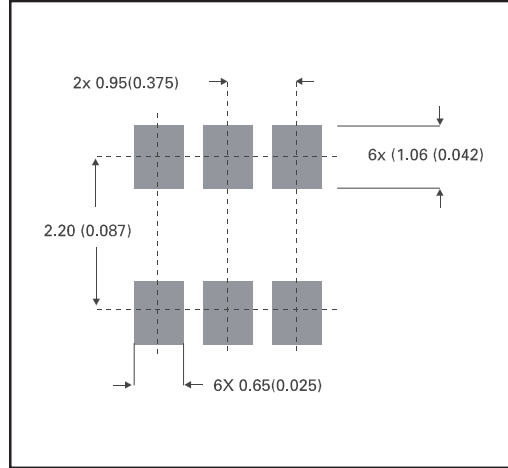


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PACKAGE OUTLINE



PAD LAYOUT DETAILS



CONTROLLING DIMENSIONS IN MILLIMETRES APPROX CONVERSIONS INCHES.

PACKAGE DIMENSIONS

DIM	Millimetres		Inches		DIM	Millimetres		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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