

# ZXMN2A03E6

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## 20V N-CANNEL ENHANCEMENT MODE MOSFET

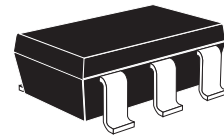
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### SUMMARY

$V_{(BR)DSS} = 20V$ ;  $R_{DS(ON)} = 0.055\Omega$ ;  $I_D = 4.6A$

### 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.



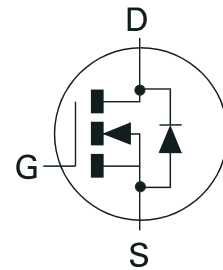
SOT23-6

### 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



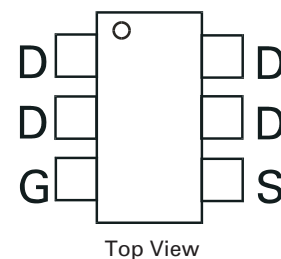
### ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN2A03E6TA	7"	8mm	3000 units
ZXMN2A03E6TC	13"	8mm	10000 units

### DEVICE MARKING

- 2A3

### PINOUT



Top View

# ZXMN2A03E6

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	20	V
Gate Source Voltage	$V_{GS}$	$\pm 12$	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)	$I_D$	4.6 3.7 3.7	A
Pulsed Drain Current (c)	$I_{DM}$	16	A
Continuous Source Current (Body Diode) (b)	$I_S$	2.7	A
Pulsed Source Current (Body Diode) (c)	$I_{SM}$	16	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

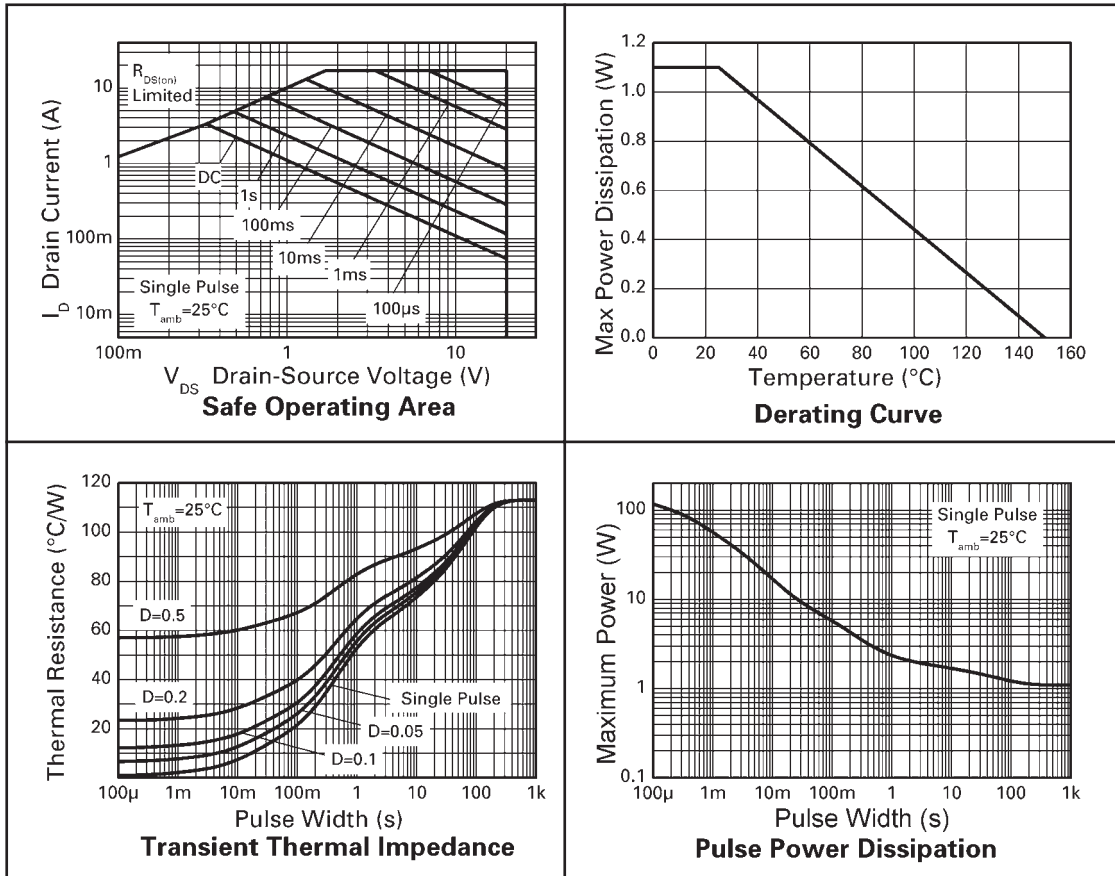
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(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. Refer to transient thermal impedance graph.

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## TYPICAL CHARACTERISTICS



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

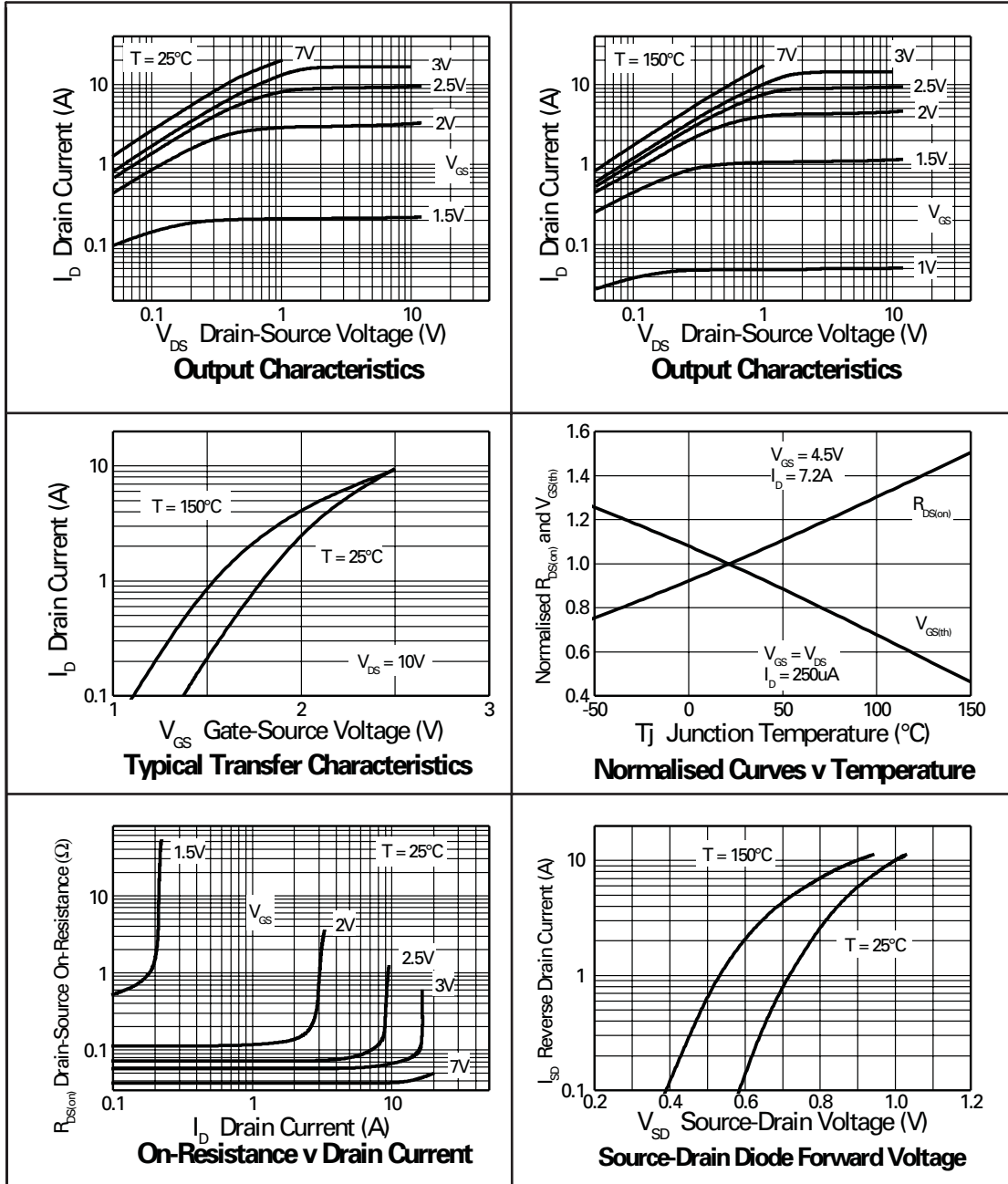
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20			V	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$			1	$\mu\text{A}$	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.7			V	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.055 0.100	$\Omega$ $\Omega$	$V_{GS}=4.5\text{V}, I_D=7.2\text{A}$ $V_{GS}=2.5\text{V}, I_D=4.6\text{A}$
Forward Transconductance (1)(3)	$g_{fs}$		13		S	$V_{DS}=10\text{V}, I_D=7.2\text{A}$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		837		pF	$V_{DS}=10\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$		168		pF	
Reverse Transfer Capacitance	$C_{rss}$		90		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		4.7		ns	$V_{DD}=10\text{V}, I_D=1\text{A}$ $R_G=6.0\Omega, V_{GS}=4.5\text{V}$
Rise Time	$t_r$		5.7		ns	
Turn-Off Delay Time	$t_{d(off)}$		18.5		ns	
Fall Time	$t_f$		10.5		ns	
Total Gate Charge	$Q_g$		8.2		nC	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V},$ $I_D=7.2\text{A}$
Gate-Source Charge	$Q_{gs}$		2.3		nC	
Gate-Drain Charge	$Q_{gd}$		2.0		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$		0.85	0.95	V	$T_J=25^\circ\text{C}, I_S=4.1\text{A},$ $V_{GS}=0\text{V}$
Reverse Recovery Time (3)	$t_{rr}$		12		ns	$T_J=25^\circ\text{C}, I_F=1.9\text{A},$ $di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Charge (3)	$Q_{rr}$		4.9		nC	

**NOTES**

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

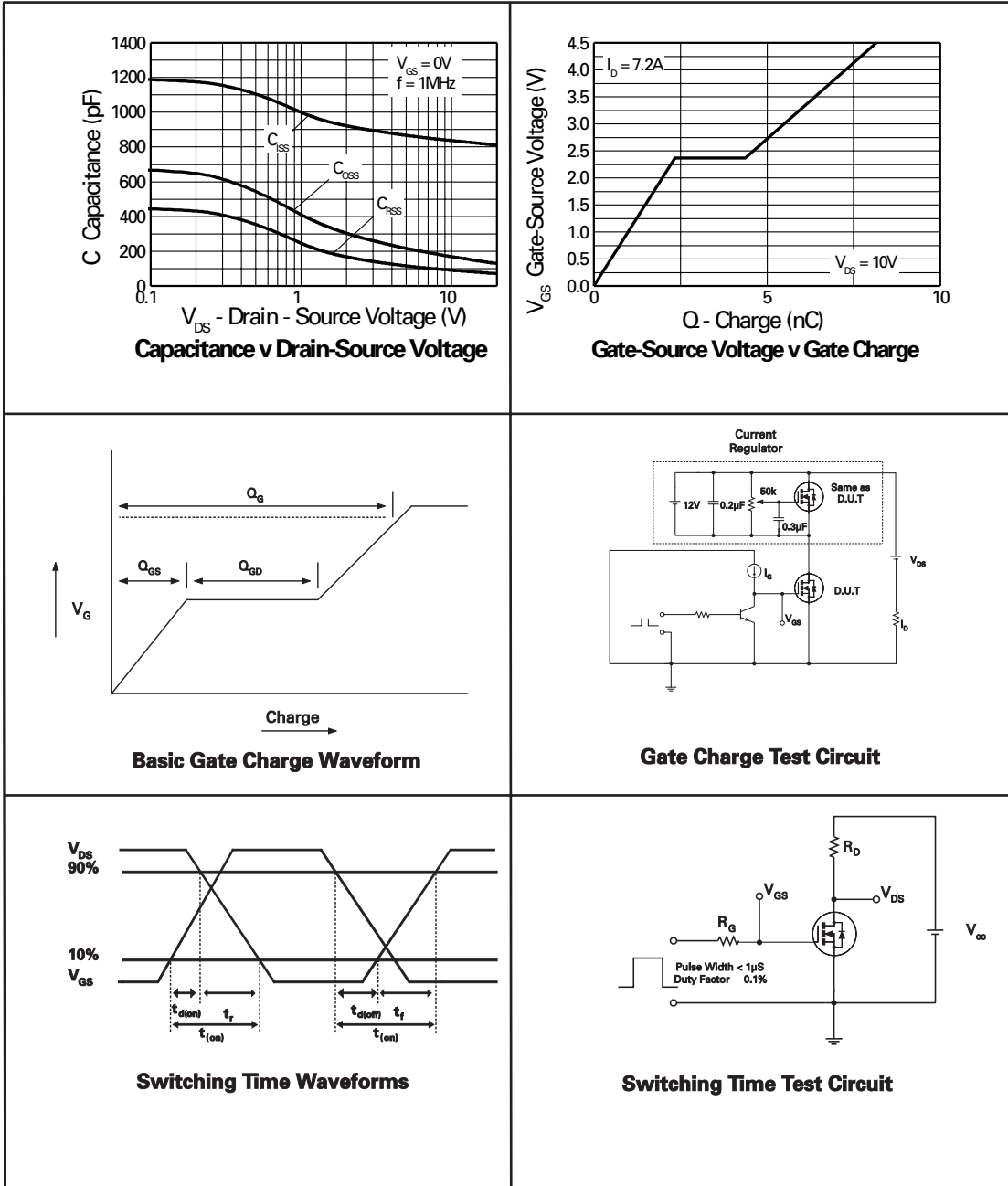
# ZXMN2A03E6

## TYPICAL CHARACTERISTICS



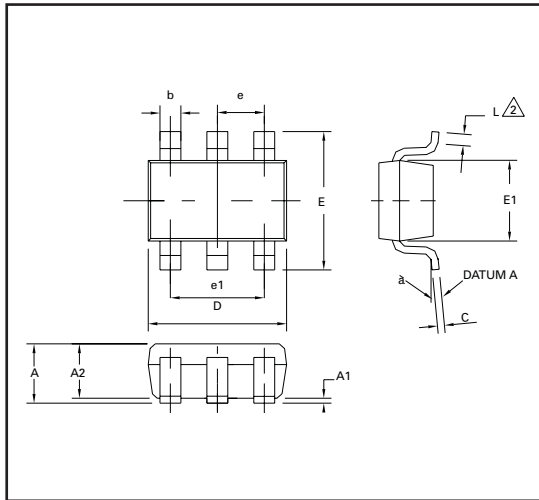
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## TYPICAL CHARACTERISTICS

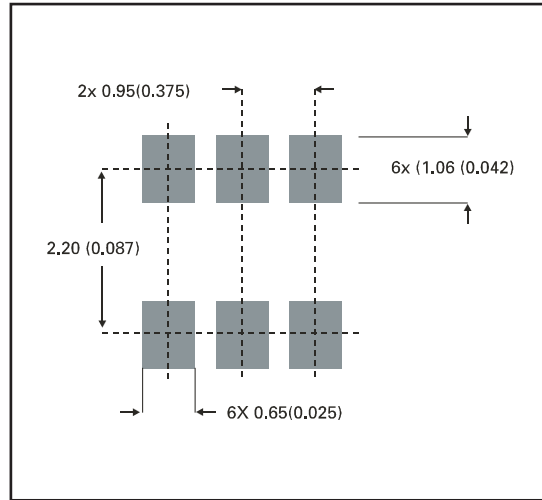


# ZXMN2A03E6

## 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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