

# ZXMN4A06G

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## 40V N-CANNEL ENHANCEMENT MODE MOSFET

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### SUMMARY

$V_{(BR)DSS} = 40V$ ;  $R_{DS(ON)} = 0.05\Omega$ ;  $I_D = 7A$

### 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
- SOT223 package

### APPLICATIONS

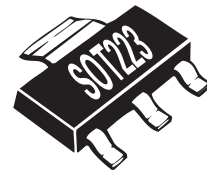
- DC - DC Converters
- Audio Output Stages
- Relay and Solenoid driving
- Motor control

### ORDERING INFORMATION

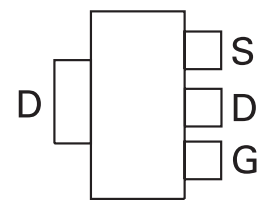
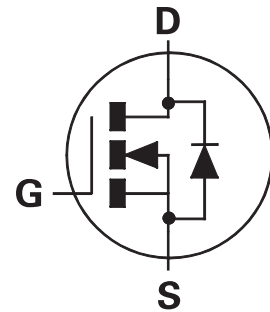
DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN4A06GTA	7"	12mm	1000 units
ZXMN4A06GTC	13"	12mm	4000 units

### DEVICE MARKING

- ZXMN  
4A06



SOT223



Top View

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## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DSS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	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)	$I_D$	7.0 5.6 5.0	A
Pulsed Drain Current (c)	$I_{DM}$	22	A
Continuous Source Current (Body Diode) (b)	$I_S$	5.4	A
Pulsed Source Current (Body Diode)(c)	$I_{SM}$	22	A
Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor	$P_D$	2.0 16	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor	$P_D$	3.9 31	W mW/ $^\circ C$
Operating and Storage Temperature Range	$T_j$ ; $T_{stg}$	-55 to +150	$^\circ C$

## THERMAL RESISTANCE

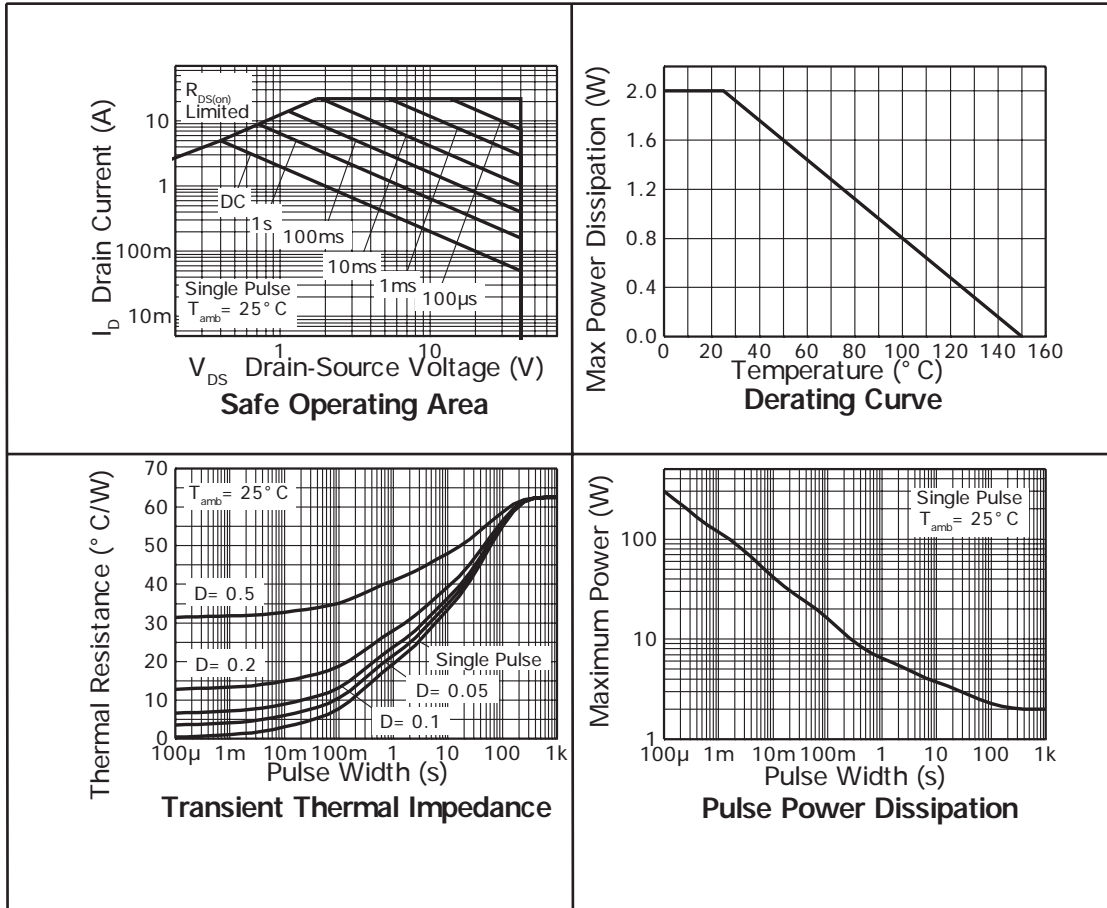
PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to Ambient (b)	$R_{\theta JA}$	32.2	$^\circ C/W$

### 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 FRA PCB, D=0.05 pulse width = 10 $\mu s$  - pulse width limited by maximum junction temperature.

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## CHARACTERISTICS



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

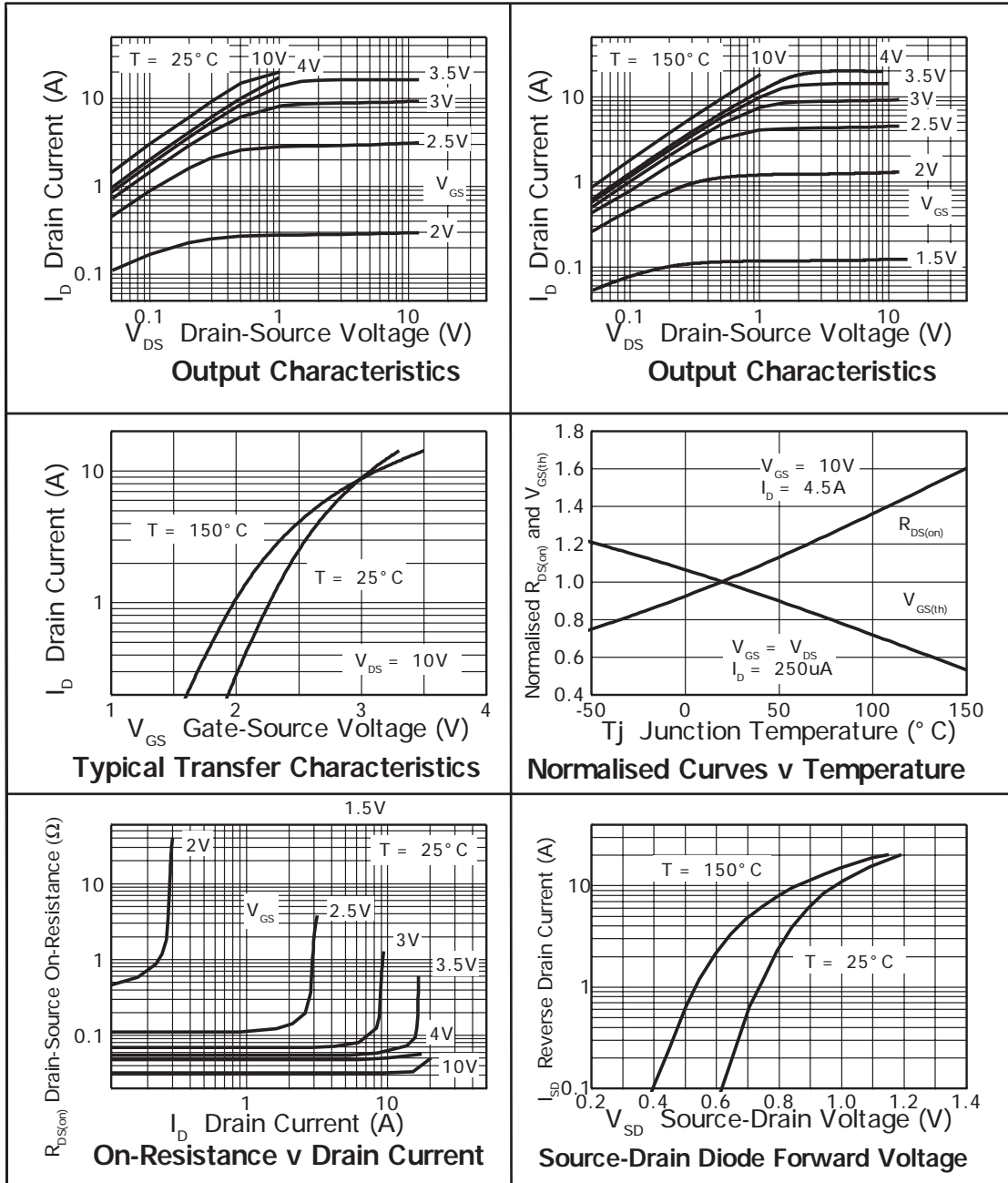
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	40			V	$I_D=250\mu A, V_{GS}=0V$
Zero Gate Voltage Drain Current	$I_{DSS}$			1	$\mu A$	$V_{DS}=40V, V_{GS}=0V$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0			V	$I_D=250\mu A, V_{DS}=V_{GS}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$			0.050 0.075	$\Omega$ $\Omega$	$V_{GS}=10V, I_D=4.5A$ $V_{GS}=4.5V, I_D=3.2A$
Forward Transconductance (3)	$g_{fs}$		8.7		S	$V_{DS}=15V, I_D=2.5A$
<b>DYNAMIC (3)</b>						
Input Capacitance	$C_{iss}$		770		pF	$V_{DS}=40V, V_{GS}=0V,$ $f=1MHz$
Output Capacitance	$C_{oss}$		92		pF	
Reverse Transfer Capacitance	$C_{rss}$		61		pF	
<b>SWITCHING(2) (3)</b>						
Turn-On Delay Time	$t_{d(on)}$		2.55		ns	$V_{DD}=30V, I_D=2.5A$ $R_G=6.0\Omega, V_{GS}=10V$ (refer to test circuit)
Rise Time	$t_r$		4.45		ns	
Turn-Off Delay Time	$t_{d(off)}$		28.61		ns	
Fall Time	$t_f$		7.35		ns	
Total Gate Charge	$Q_g$		18.2		nC	$V_{DS}=30V, V_{GS}=10V,$ $I_D=2.5A$ (refer to test circuit)
Gate-Source Charge	$Q_{gs}$		2.1		nC	
Gate-Drain Charge	$Q_{gd}$		4.5		nC	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (1)	$V_{SD}$		0.8	0.95	V	$T_J=25^\circ C, I_S=2.5A,$ $V_{GS}=0V$
Reverse Recovery Time (3)	$t_{rr}$		19.86		ns	$T_J=25^\circ C, I_F=2.5A,$ $di/dt=100A/\mu s$
Reverse Recovery Charge (3)	$Q_{rr}$		16.36		nC	

### NOTES

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

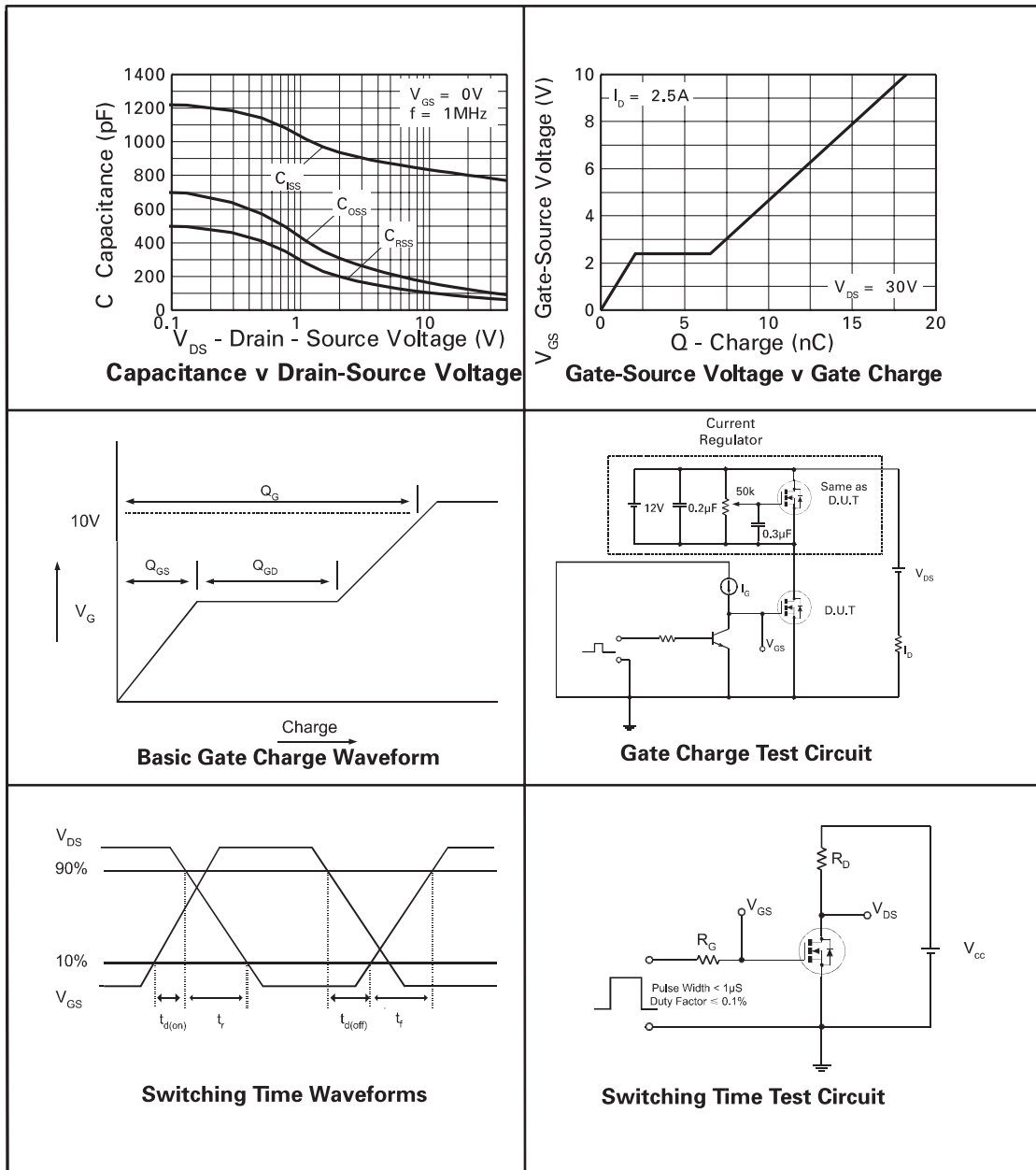
# ZXMN4A06G

## TYPICAL CHARACTERISTICS



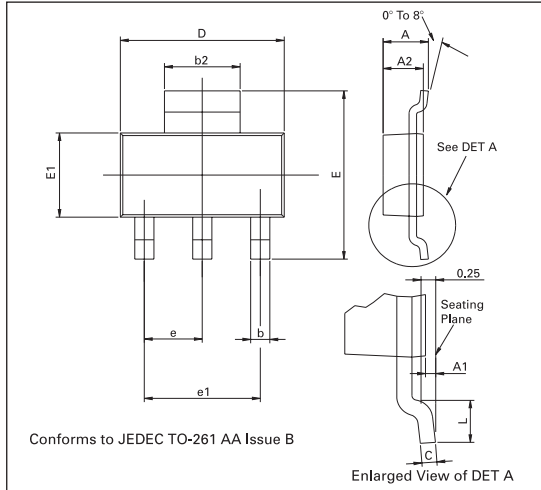
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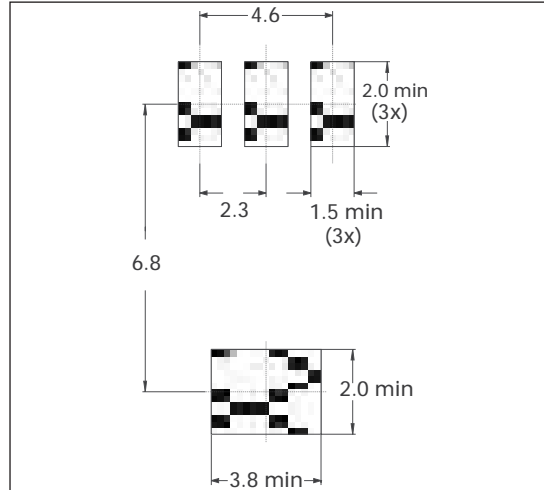


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## PACKAGE OUTLINE



## PAD LAYOUT DETAILS



## PACKAGE DIMENSIONS

DIM	MILLIMETRES		DIM	MILLIMETRES	
	MIN	MAX		MIN	MAX
A	—	1.80	D	6.30	6.70
A1	0.02	0.10	e	2.30 BASIC	
A2	1.55	1.65	e1	4.60 BASIC	
b	0.66	0.84	E	6.70	7.30
b2	2.90	3.10	E1	3.30	3.70
C	0.23	0.33	L	0.90	—

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ISSUE 1 - MAY 2002

ZETEX