

ZXMN6A09G

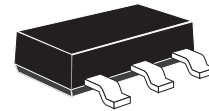
60V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS} = 60V$; $R_{DS(ON)} = 0.045\Omega$ $I_D = 5.1A$

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.



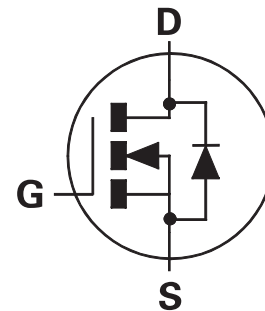
SOT223

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- Low profile SOIC package

APPLICATIONS

- DC - DC Converters
- Power Management Functions
- Relay and Solenoid driving
- Motor control

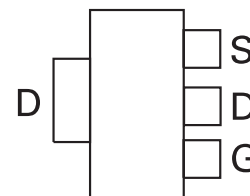


ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXMN6A09GTA	7"	12mm	1000 units
ZXMN6A09GTC	13"	12mm	4000 units

DEVICE MARKING

- ZXMN
6A09



Top View

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ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DSS}	60	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	6.9 5.6 5.0	A
Pulsed Drain Current ^(c)	I_{DM}	30.6	A
Continuous Source Current (Body Diode) ^(b)	I_S	3.5	A
Pulsed Source Current (Body Diode) ^(c)	I_{SM}	30.6	A
Power Dissipation at $T_A=25^\circ C$ ^{(a)(d)} Linear Derating Factor	P_D	2.0 16	W mW/ $^\circ C$
Power Dissipation at $T_A=25^\circ C$ ^{(b)(d)} 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)(d)}	$R_{\theta JA}$	62.5	$^\circ C/W$
Junction to Ambient ^{(b)(d)}	$R_{\theta JA}$	32.2	$^\circ C/W$

NOTES

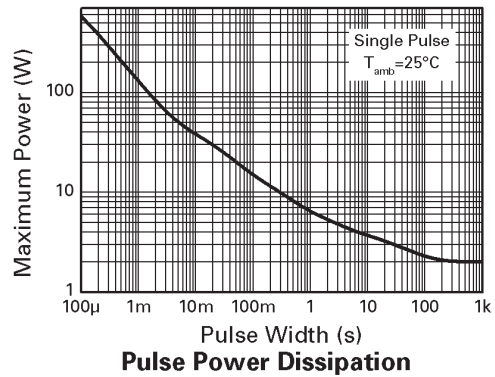
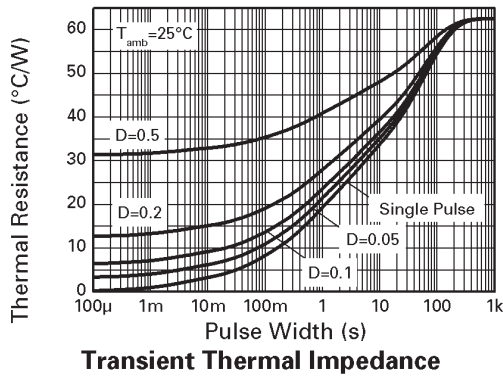
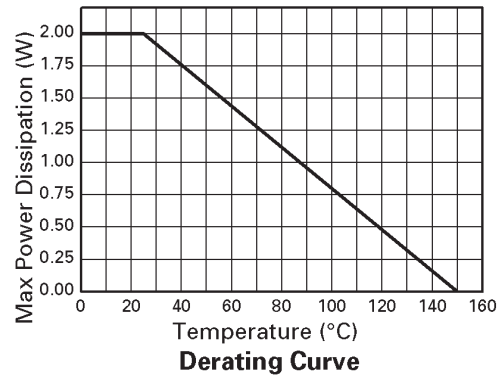
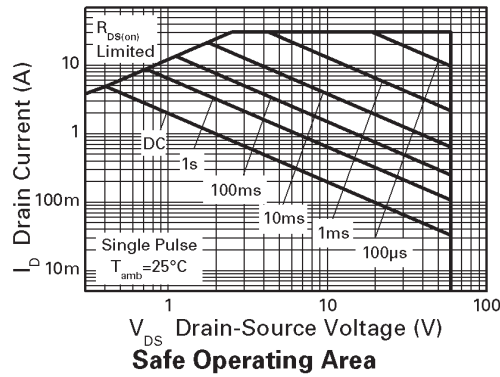
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D=0.02 pulse width=300 μs - pulse width limited by maximum junction temperature.

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CHARACTERISTICS



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

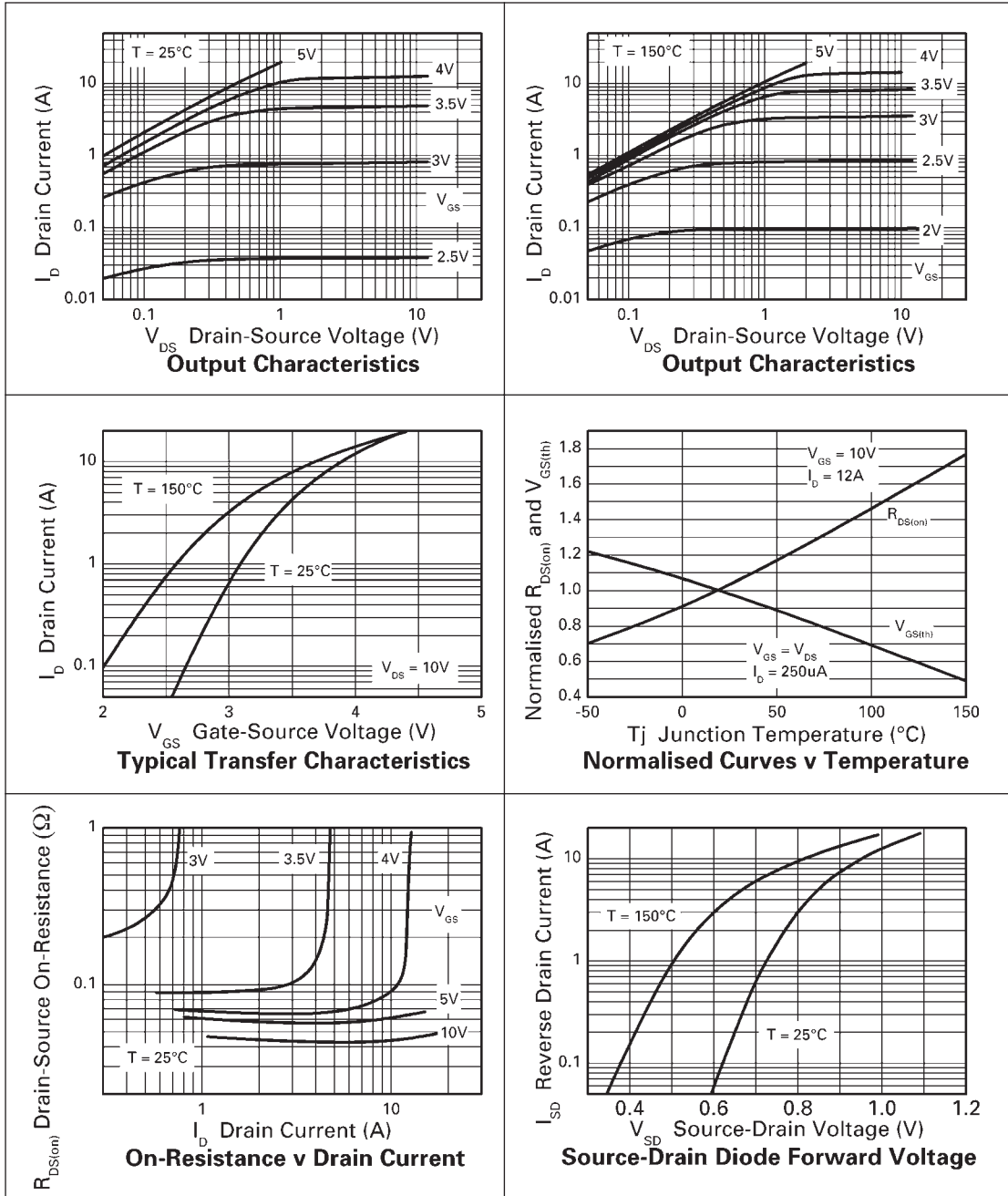
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	60			V	I _D =250μA, V _{GS} =0V
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} =60V, V _{GS} =0V
Gate-Body Leakage	I _{GSS}			100	nA	V _{GS} =±20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	1.0			V	I _D =250μA, V _{DS} = V _{GS}
Static Drain-Source On-State Resistance (1)	R _{DS(on)}			0.045 0.070	Ω Ω	V _{GS} =10V, I _D =8.2A V _{GS} =4.5V, I _D =7.4A
Forward Transconductance (3)	g _{fs}		15		S	V _{DS} =15V,I _D =8.2A
DYNAMIC (3)						
Input Capacitance	C _{iss}		1407		pF	V _{DS} =40 V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{Oss}		121		pF	
Reverse Transfer Capacitance	C _{rss}		59		pF	
SWITCHING(2) (3)						
Turn-On Delay Time	t _{d(on)}		4.9		ns	V _{DD} =15V, I _D =3.5A R _G ≐6.0Ω, V _{GS} =10V (refer to test circuit)
Rise Time	t _r		5.0		ns	
Turn-Off Delay Time	t _{d(off)}		25.3		ns	
Fall Time	t _f		4.6		ns	
Gate Charge	Q _g		12.4		nC	V _{DS} =15V,V _{GS} =5V, I _D =3.5A
Total Gate Charge	Q _g		24.2		nC	V _{DS} =15V,V _{GS} =10V, I _D =3.5A
Gate-Source Charge	Q _{gs}		5.2		nC	
Gate-Drain Charge	Q _{gd}		3.5		nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (1)	V _{SD}		0.85	0.95	V	T _J =25°C, I _S =6.6A, V _{GS} =0V
Reverse Recovery Time (3)	t _{rr}		26.3		ns	T _J =25°C, I _F =3.5A, di/dt= 100A/μs
Reverse Recovery Charge (3)	Q _{rr}		26.6		nC	

NOTES

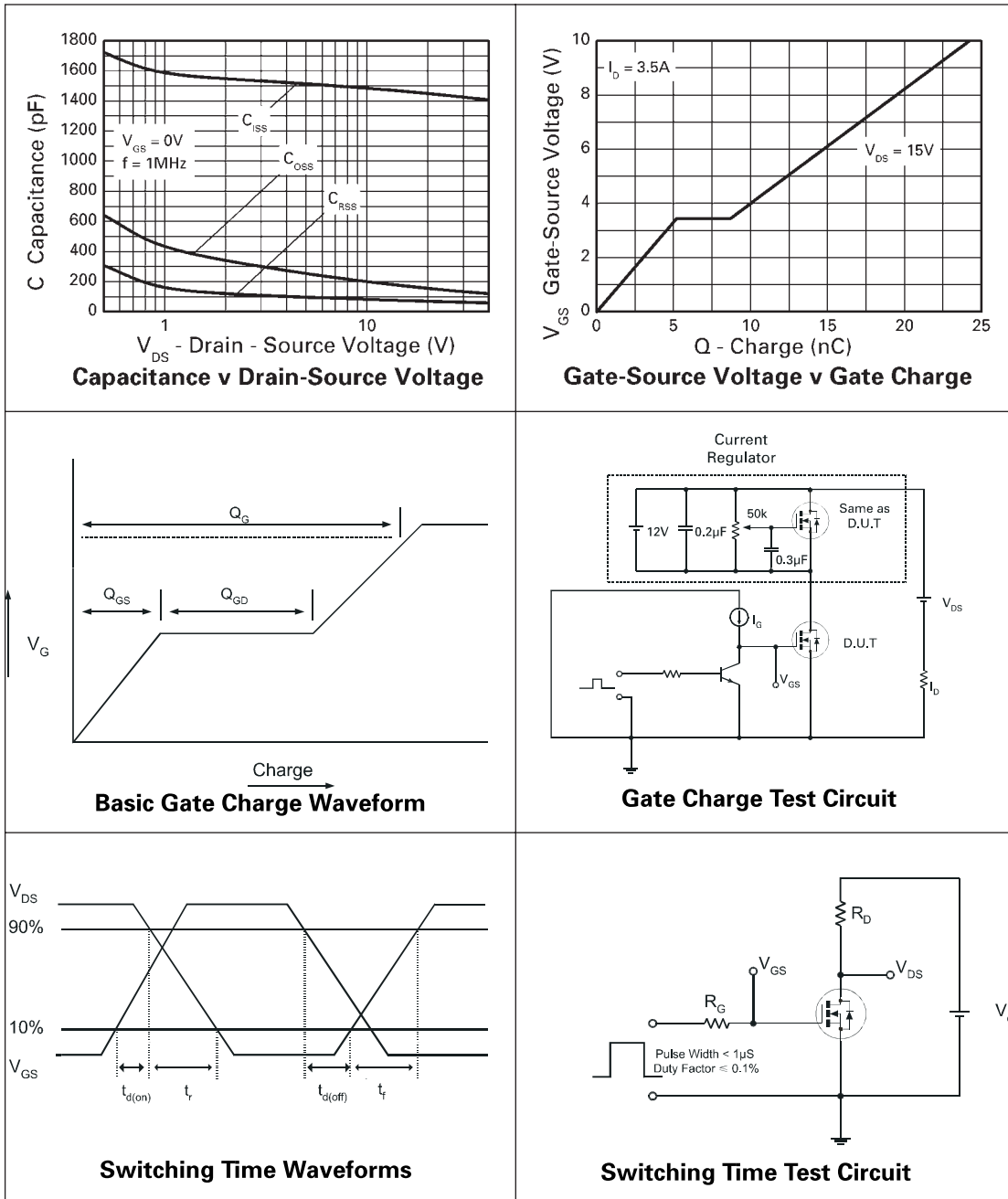
- (1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

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TYPICAL CHARACTERISTICS

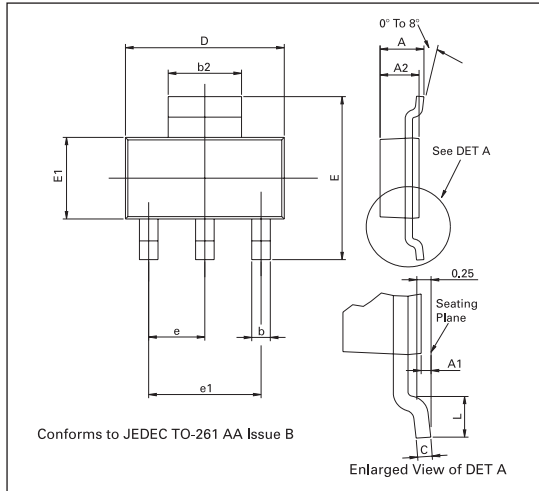


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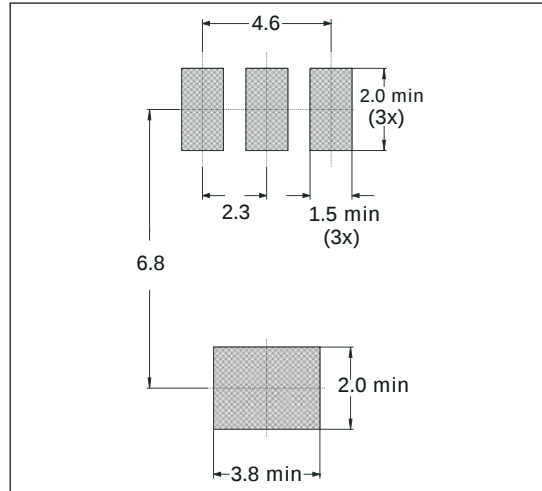


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PACKAGE OUTLINE



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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