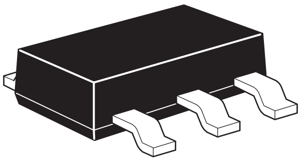
ZXMN6A08G
60V SOT223 N-channel enhancement mode MOSFET

Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ (Ω)	I_D (A)
60	0.080 @ V_{GS} = 10V	5.3
	0.150 @ V_{GS} = 4.5V	2.8

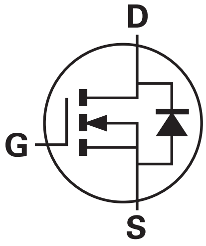


Description

This new generation trench MOSFET from Zetex features a unique structure combining the benefits of low on-resistance and fast switching, making it ideal for high efficiency power management applications.

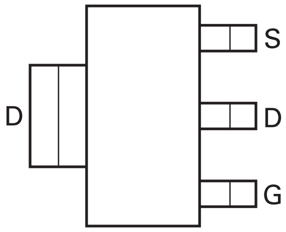
Features

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT223 package



Applications

- DC-DC converters
- Power management functions
- Disconnect switches
- Motor control



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN6A08GTA	7	12	1,000
ZXMN6A08GTC	13	12	4,000

Device marking

ZXMN
6A08

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_{amb} = 25°C(b)	I_D	5.3	A
	@ V_{GS} = 10V; T_{amb} = 70°C(b)		4.2	
	@ V_{GS} = 10V; T_{amb} = 25°C(a)		3.8	
Pulsed drain current(c)		I_{DM}	20	A
Continuous source current (body diode)(b)		I_S	2.1	A
Pulsed source current (body diode)(c)		I_{SM}	20	A
Power dissipation at T_{amb} = 25°C(a)		P_D	2	W
Linear derating factor			16	mW/°C
Power dissipation at T_{amb} = 25°C(b)		P_D	3.9	W
Linear derating factor			31	mW/°C
Operating and storage temperature range		T_j, T_{stg}	-55 to +150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient(a)	$R_{\Theta JA}$	62.5	°C/W
Junction to ambient(b)	$R_{\Theta JA}$	32	°C/W

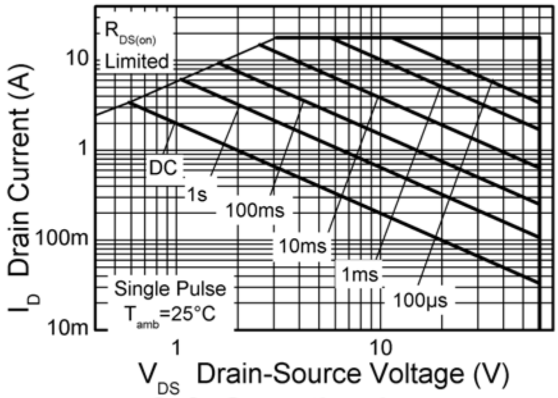
NOTES:

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

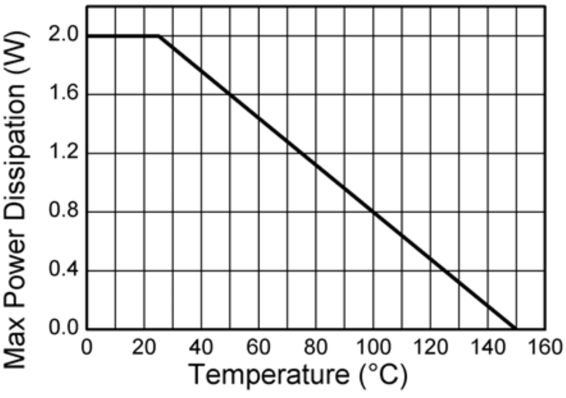
(b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ sec.

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

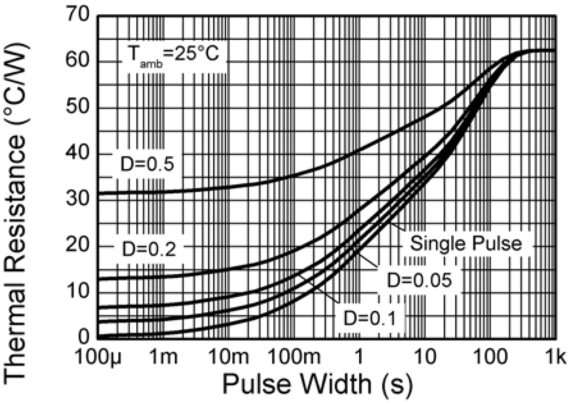
Typical characteristics



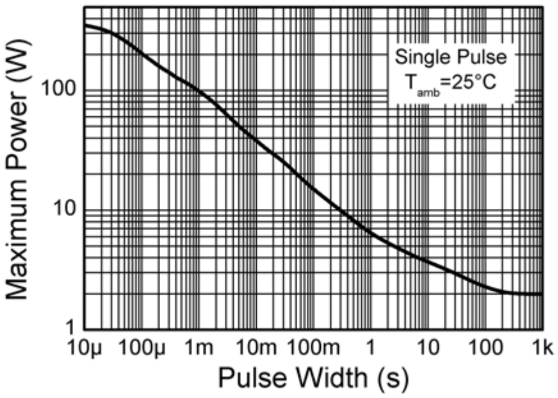
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

Electrical characteristics (at T_{amb} = 25°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}			0.5	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			V	I_D= 250µA, V_{DS}=V_{GS}
Static drain-source on-state resistance(*)	$R_{DS(on)}$			0.080	Ω	V_{GS}= 10V, I_D= 4.8A
				0.150	Ω	V_{GS}= 4.5V, I_D = 4.2A
Forward transconductance (*) (‡)	g_{fs}		6.6		S	V_{DS}= 15V, I_D= 4.8A
Dynamic(‡)						
Input capacitance	C_{iss}		459		pF	V_{DS}= 40V, V_{GS}=0V f=1MHz
Output capacitance	C_{oss}		44.2		pF	
Reverse transfer capacitance	C_{rss}		24.1		pF	
Switching (†) (‡)						
Turn-on delay time	$t_{d(on)}$		2.6		ns	V_{DD}= 30V, I_D= 1.5A R_G≅6.0Ω, V_{GS}= 10V
Rise time	t_r		2.1		ns	
Turn-off delay time	$t_{d(off)}$		12.3		ns	
Fall time	t_f		4.6		ns	
Gate charge	Q_g		4.0		nC	V_{DS}= 30V, V_{GS}= 5V I_D= 1.4A
Total gate charge	Q_g		5.8		nC	V_{DS}= 30V, V_{GS}= 10V I_D= 1.4A
Gate-source charge	Q_{gs}		1.4		nC	
Gate drain charge	Q_{gd}		1.9		nC	
Source-drain diode						
Diode forward voltage(*)	V_{SD}		0.88	1.2	V	T_j=25°C, I_S= 4A, V_{GS}=0V
Reverse recovery time(‡)	t_{rr}		19.2		ns	Tj=25°C, I_S= 1.4A, di/dt=100A/µs
Reverse recovery charge(‡)	Q_{rr}		30.3		nC	

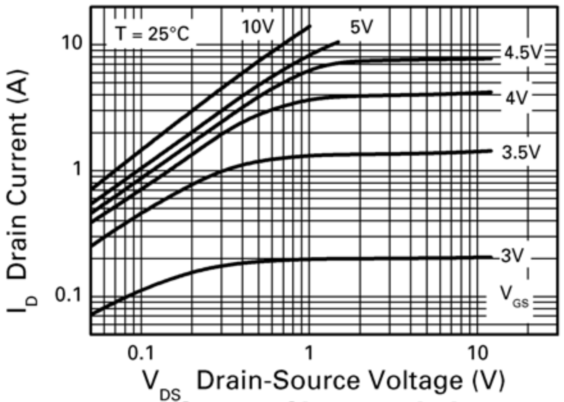
NOTES:

(*) Measured under pulsed conditions. Pulse width ≤300µs; duty cycle ≤2%.

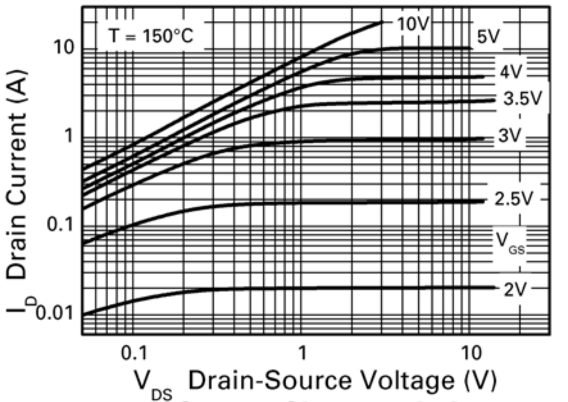
(†) Switching characteristics are independent of operating junction temperature.

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

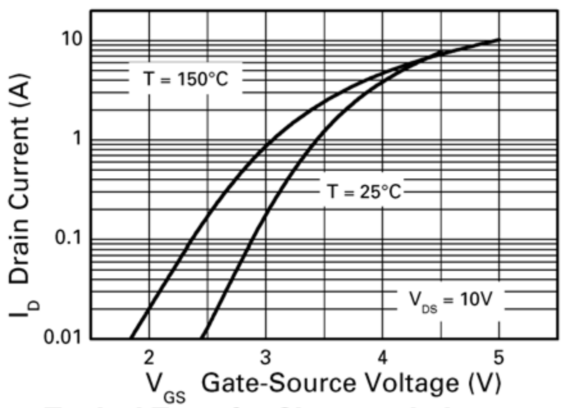
Typical characteristics



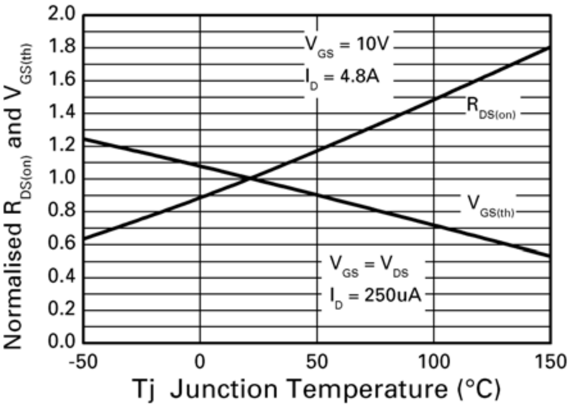
Output Characteristics



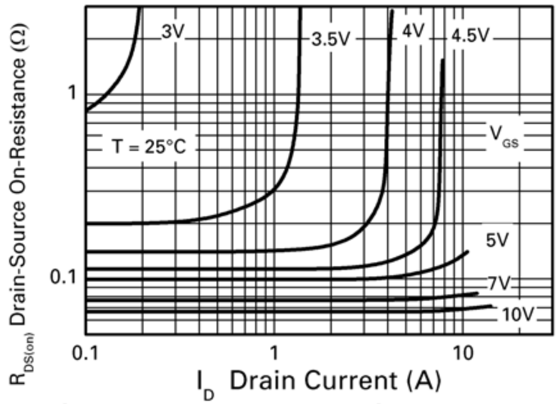
Output Characteristics



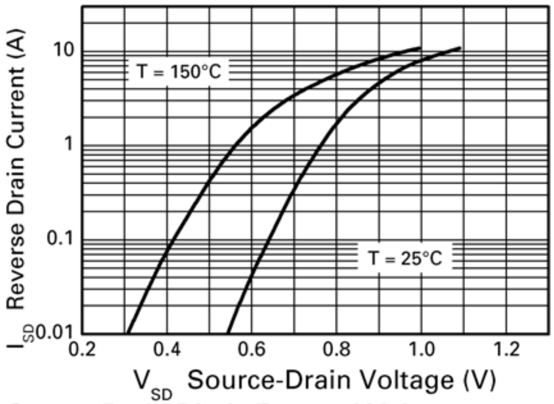
Typical Transfer Characteristics



Normalised Curves v Temperature

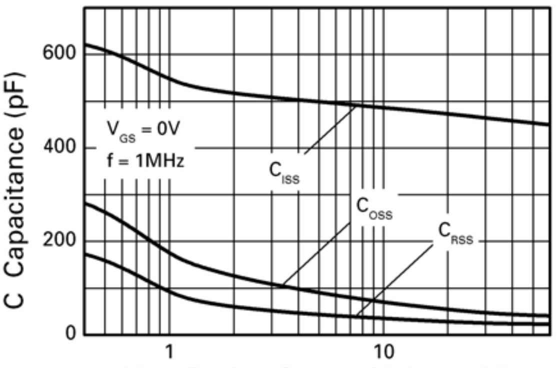


On-Resistance v Drain Current

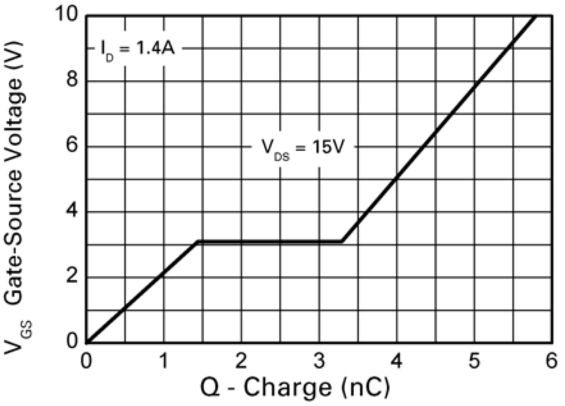


Source-Drain Diode Forward Voltage

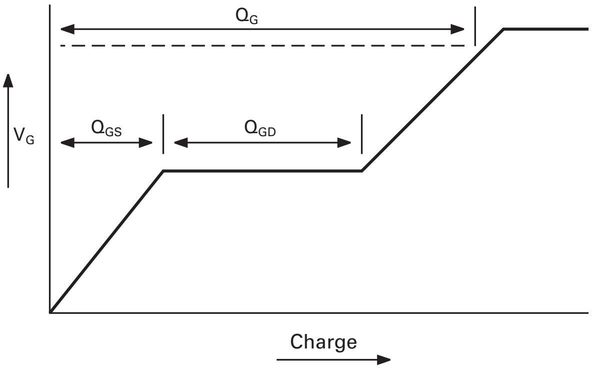
Typical characteristics



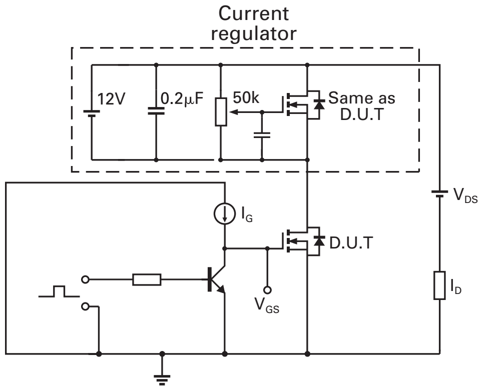
Capacitance v Drain-Source Voltage



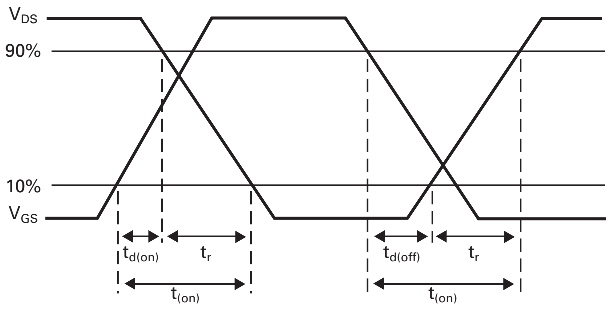
Gate-Source Voltage v Gate Charge



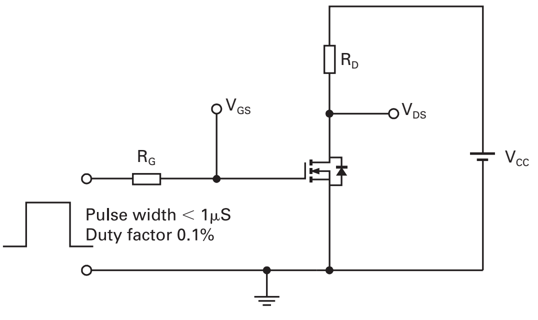
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



Switching time test circuit

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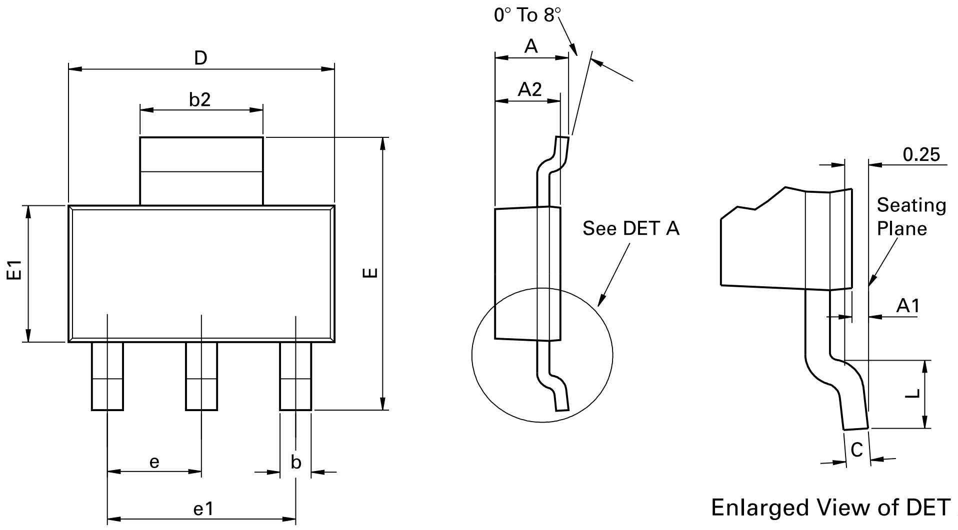
Package outline - SOT223



Enlarged View of DET A

Conforms to JEDEC TO-261 AA Issue B

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	e	2.30 BSC		0.0905 BSC	
A1	0.02	0.10	0.0008	0.004	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
C	0.23	0.33	0.009	0.013	L	0.90	-	0.355	-
D	6.30	6.70	0.248	0.264	-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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