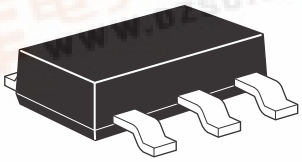
ZXMN7A11G
70V N-channel enhancement mode MOSFET

Summary

V_{DSS}=70V : $R_{DS(on)}$=0.13Ω

I_D=3.8A

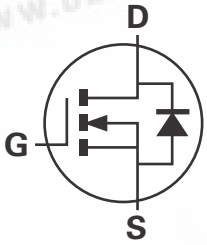


Description

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.

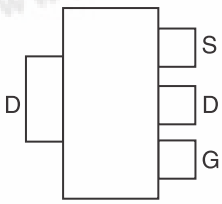
Features

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



Applications

- DC-DC converters
- Power management functions
- Disconnect switches
- Motor control
- Class D audio output stages



Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN7A11GTA	7	12	1,000
ZXMN7A11GTC	13	12	4,000

Device marking

ZXMN
7A11

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DSS}	70	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current @ V_{GS}=10V; T_A=25°C(b)	I_D	3.8	A
@ V_{GS}=10V; T_A=70°C(b)		3.0	A
@ V_{GS}=10V; T_A=25°C(a)		2.7	A
Pulsed drain current(c)	I_{DM}	10	A
Continuous source current (body diode)(b)	I_S	5	A
Pulsed source current (body diode)(c)	I_{SM}	10	A
Power dissipation at T_A =25°C (a) Linear derating factor	P_D	2 16	W mW/°C
Power dissipation at T_A =25°C(b) Linear derating factor	P_D	3.9 31	W 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

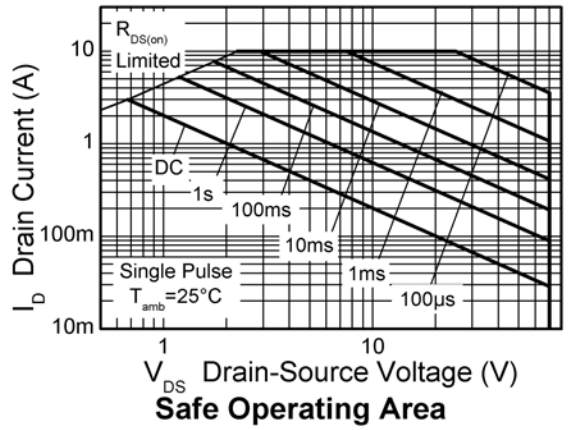
NOTES:

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

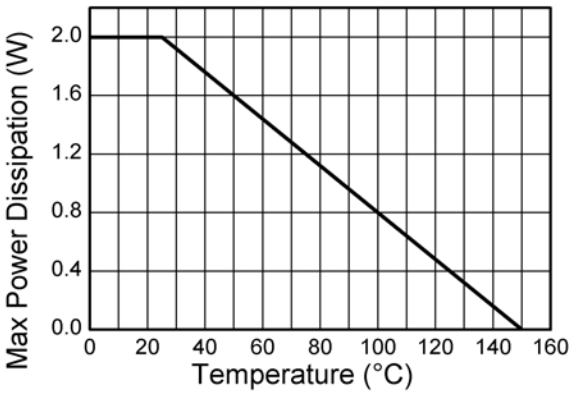
(b) For a device surface mounted on FR4 PCB measured at t ≤ 5 sec.

(c) Repetitive rating 25mm x 25mm FR4 PCB, D=0.05 pulse width=10μs - pulse width limited by maximum junction temperature.

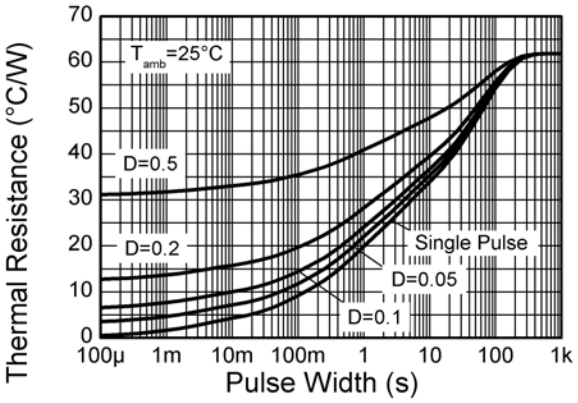
Characteristics



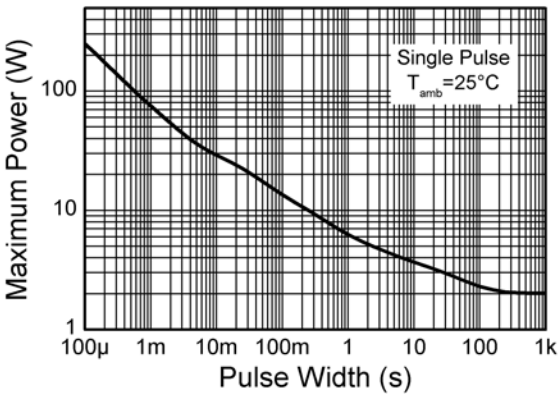
Safe Operating Area



Derating Curve



Transient Thermal Impedance



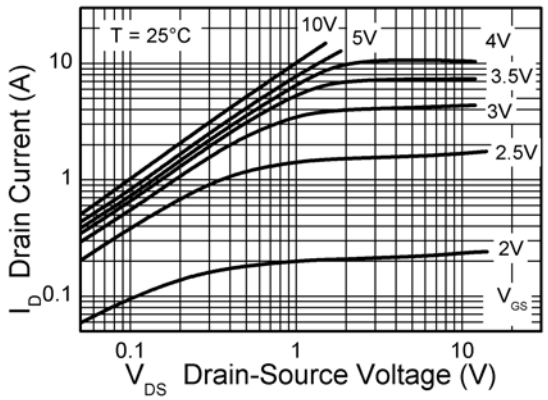
Pulse Power Dissipation

Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

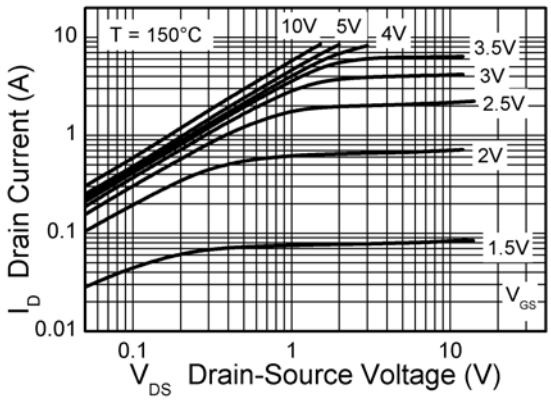
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	70			V	I_D= 250μA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}			1	μA	V_{DS}= 70V, V_{GS}=0V
Gate-body leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-source threshold voltage	$V_{GS(th)}$	1.0			V	I_D= 250μA, V_{DS}=V_{GS}
Static drain-source on-state resistance (*)	$R_{DS(on)}$			0.13	Ω	V_{GS}= 10V, I_D= 4.4A
				0.19	Ω	V_{GS}= 4.5V, I_D = 3.8A
Forward transconductance(*)(‡)	g_{fs}		4.66		S	V_{DS}= 15V, I_D= 4.4A
Dynamic(‡)						
Input capacitance	C_{iss}		298		pF	V_{DS}= 40V, V_{GS}=0V f=1MHz
Output capacitance	C_{oss}		35		pF	
Reverse transfer capacitance	C_{rss}		21		pF	
Switching (†)(‡)						
Turn-on-delay time	$t_{d(on)}$		1.9		ns	V_{DD}= 35V, I_D= 1A R_G≅6.0Ω, V_{GS}= 10V
Rise time	t_r		2		ns	
Turn-off delay time	$t_{d(off)}$		11.5		ns	
Fall time	t_f		5.8		ns	
Total gate charge	Q_g		4.35		nC	V_{DS}= 35V, V_{GS}= 5V I_D= 4.4A
Total gate charge	Q_g		7.4		nC	V_{DS}=35V, V_{GS}= 10V I_D= 4.4A
Gate-source charge	Q_{gs}		1.06		nC	
Gate drain charge	Q_{gd}		1.8		nC	
Source-drain diode						
Diode forward voltage(*)	V_{SD}		0.85	0.95	V	T_j=25°C, I_S= 2.5A, V_{GS}=0V
Reverse recovery time (‡)	t_{rr}		19.8		ns	T_j=25°C, I_S= 2.5A, di/dt=100A/μs
Reverse recovery charge(‡)	Q_{rr}		14		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.

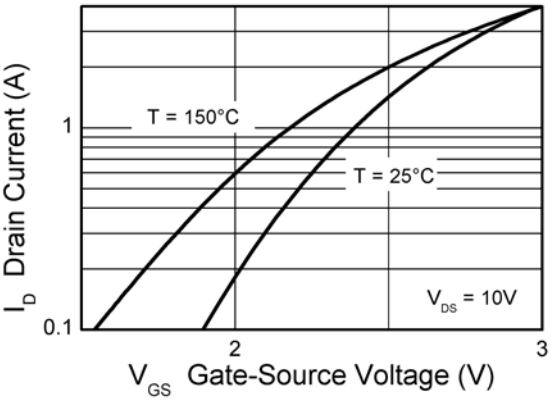
Typical characteristics



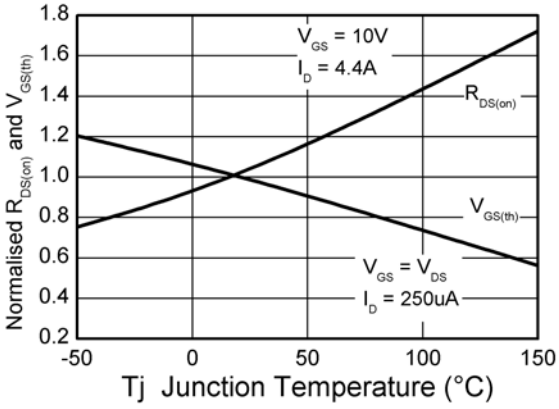
Output Characteristics



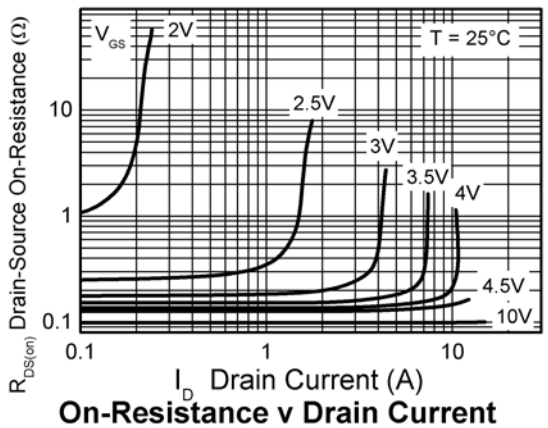
Output Characteristics



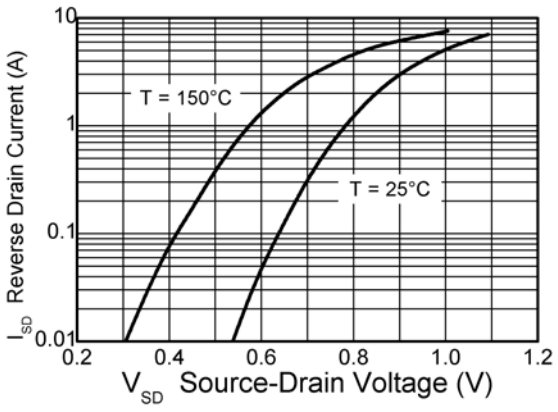
Typical Transfer Characteristics



Normalised Curves v Temperature

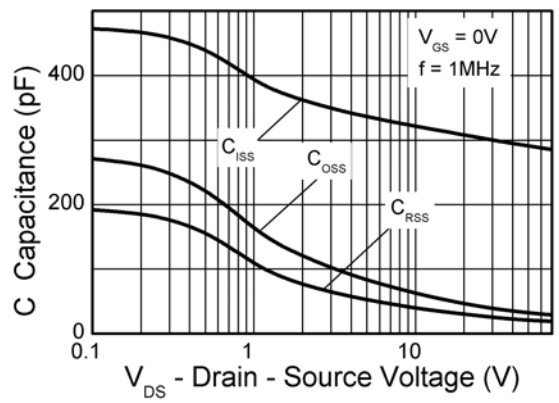


On-Resistance v Drain Current

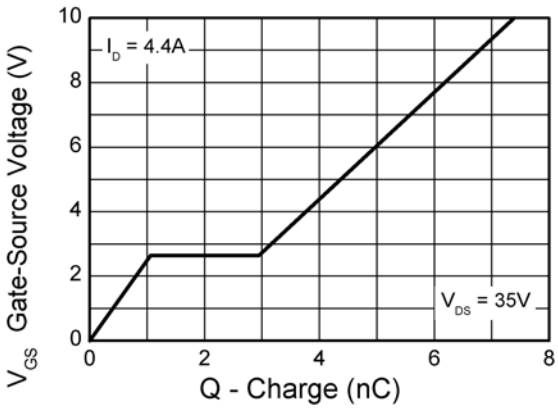


Source-Drain Diode Forward Voltage

Typical characteristics



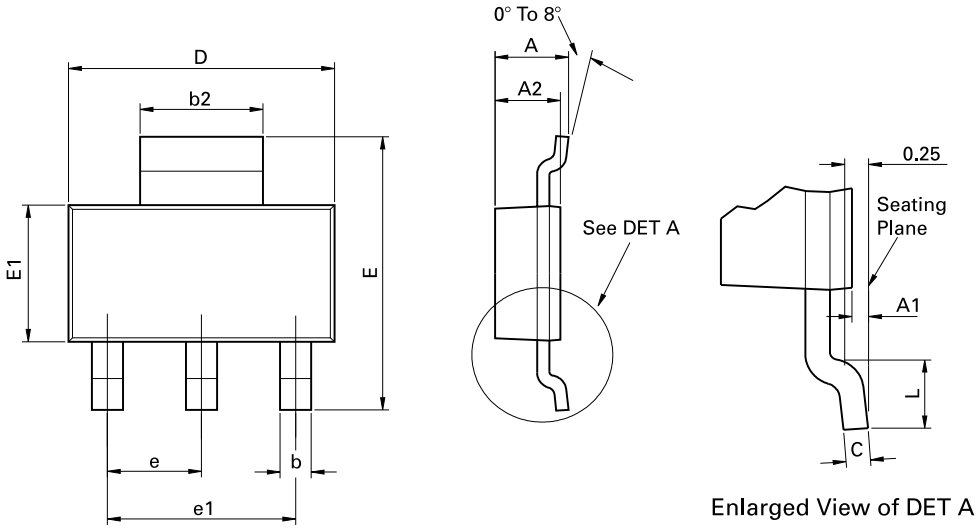
Capacitance v Drain-Source Voltage



Gate-Source Voltage v Gate Charge

Intentionally left blank

Package outline - SOT223



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

Europe
Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany

Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49
europe.sales@zetex.com

Americas
Zetex Inc
700 Veterans Memorial Highway
Hauppauge, NY 11788
USA

Telephone: (1) 631 360 2222
Fax: (1) 631 360 8222
usa.sales@zetex.com

Asia Pacific
Zetex (Asia Ltd)
3701-04 Metroplaza Tower 1
Hing Fong Road, Kwai Fong
Hong Kong

Telephone: (852) 26100 611
Fax: (852) 24250 494
asia.sales@zetex.com

Corporate Headquarters
Zetex Semiconductors plc
Zetex Technology Park, Chadderton
Oldham, OL9 9LL
United Kingdom

Telephone: (44) 161 622 4444
Fax: (44) 161 622 4446
hq@zetex.com