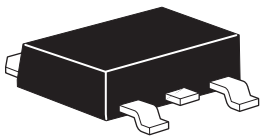
ZXMN7A11K
70V N-channel enhancement mode MOSFET

Summary



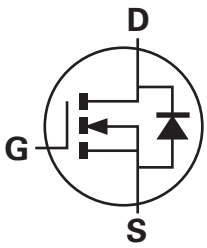
$V_{(BR)DSS}$=70V : $R_{DS(on)}$=0.13Ω

I_D=6.1A

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.

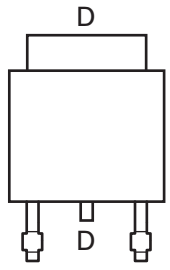
Features



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

Applications

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



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN7A11KTC	13	16	2,500

Device marking

ZXMN
7A11

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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) @ V_{GS}=10V; T_A=70°C (b) @ V_{GS}=10V; T_A=25°C (a)	I_D	6.1 4.9 4.2	A
Pulsed drain current (c)	I_{DM}	17	A
Continuous source current (body diode) (b)	I_S	8.7	A
Pulsed source current (body diode) (c)	I_{SM}	17	A
Power dissipation at T_A =25°C (a) Linear derating factor	P_D	4.06 32.4	W mW/°C
Power dissipation at T_A =25°C (b) Linear derating factor	P_D	8.5 68	W mW/°C
Power dissipation at T_A =25°C (d) Linear derating factor	P_D	2.11 16.8	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	$R_{\Theta JA}$	30.8	°C/W
Junction to ambient	$R_{\Theta JA}$	14.7	°C/W
Junction to ambient	$R_{\Theta JA}$	59.1	°C/W

NOTES:

(a) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

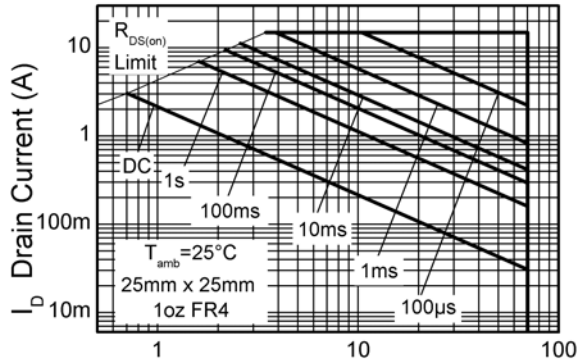
(b) For a device surface mounted on FR4 PCB measured at t $\leq$ 10 sec.

(c) Repetitive rating 50mm x 50mm x 1.6mm FR4 PCB, D=0.02 pulse width=300μs - pulse width limited by maximum junction temperature.

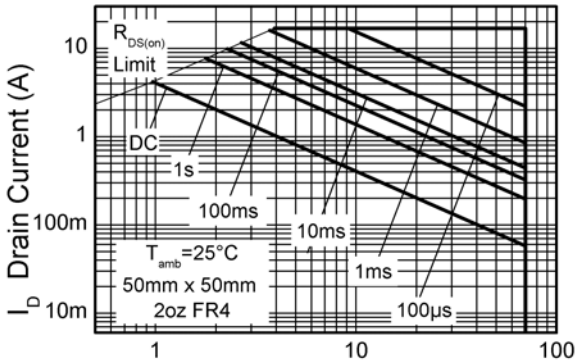
(d) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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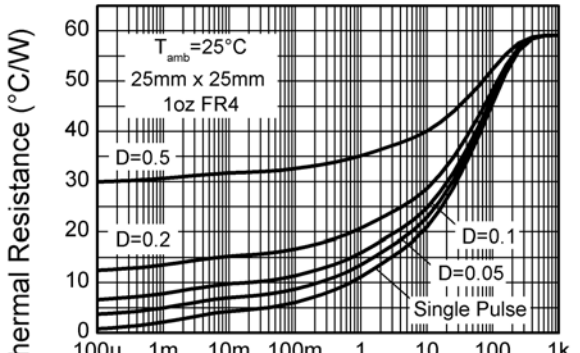
Characteristics



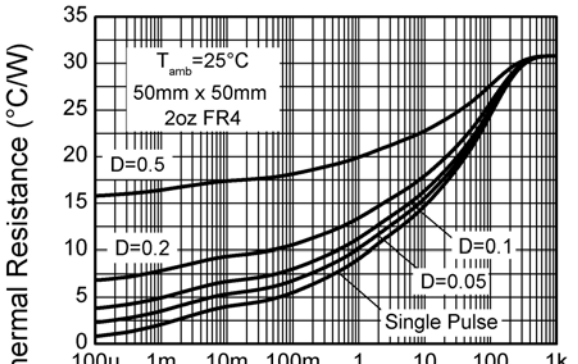
Safe Operating Area



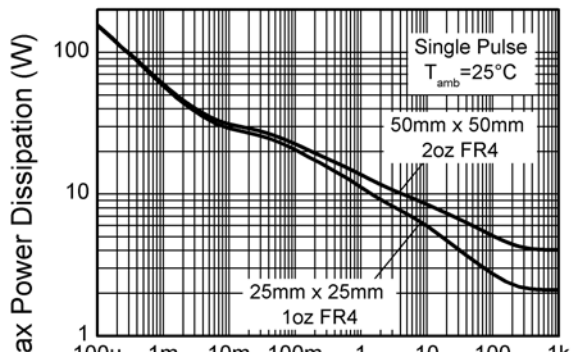
Safe Operating Area



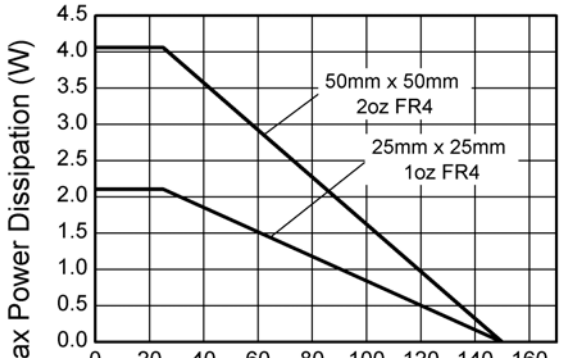
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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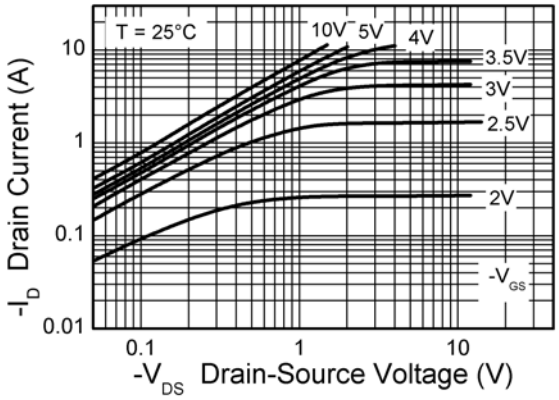
Electrical characteristics (at Tamb = 25°C unless otherwise stated)

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	

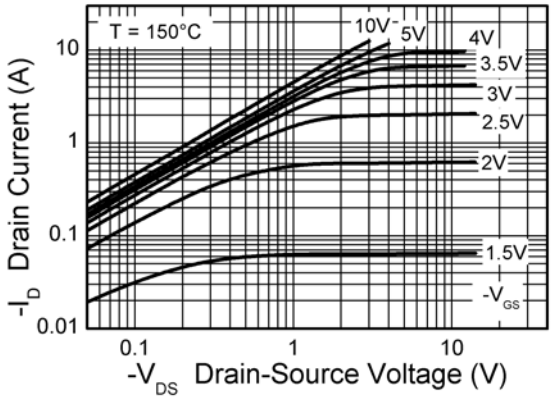
NOTES:
(*) Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
(†) Switching characteristics are independent of operating junction temperature.
(‡) For design aid only, not subject to production testing.

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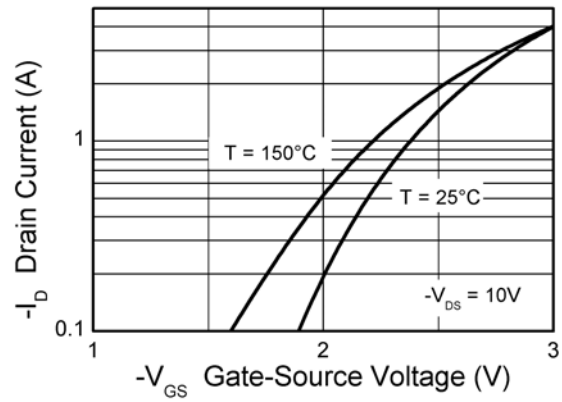
Typical characteristics



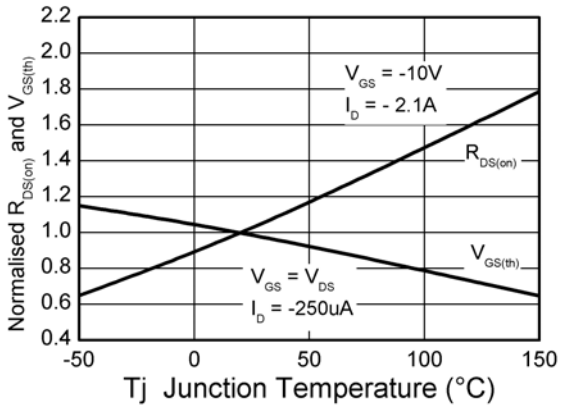
Output Characteristics



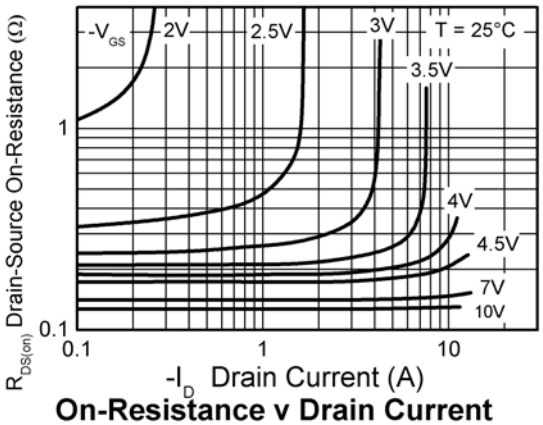
Output Characteristics



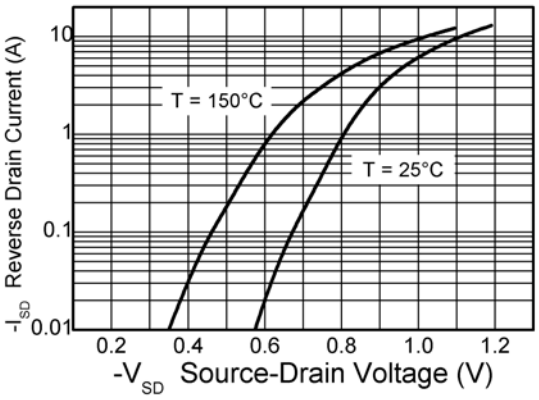
Typical Transfer Characteristics



Normalised Curves v Temperature



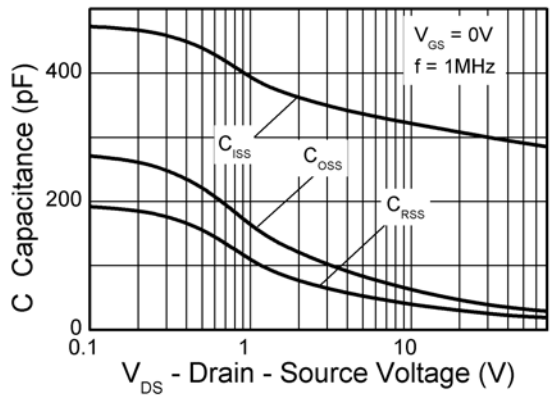
On-Resistance v Drain Current



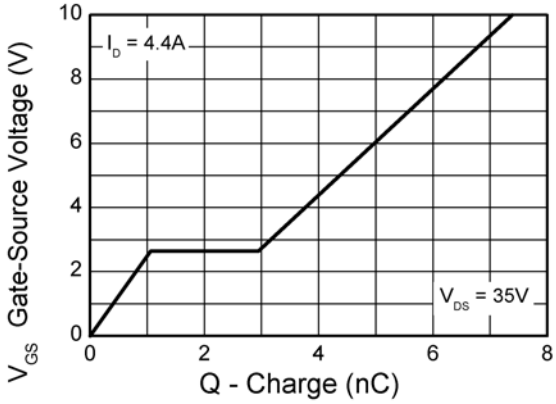
Source-Drain Diode Forward Voltage

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Typical characteristics



Capacitance v Drain-Source Voltage



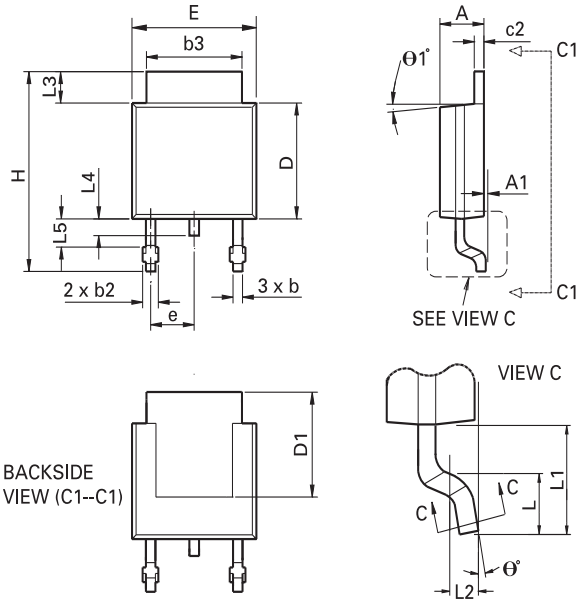
Gate-Source Voltage v Gate Charge

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Package outline - DPAK



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.086	0.094	2.18	2.39	e	0.090 BSC		2.29 BSC	
A1	-	0.005	-	0.127	H	0.370	0.410	9.40	10.41
b	0.020	0.035	0.508	0.89	L	0.055	0.070	1.40	1.78
b2	0.030	0.045	0.762	1.14	L1	0.108 REF		2.74 REF	
b3	0.205	0.215	5.21	5.46	L2	0.020 BSC		0.508 BSC	
c	0.018	0.024	0.457	0.61	L3	0.035	0.065	0.89	1.65
c2	0.018	0.023	0.457	0.584	L4	0.025	0.040	0.635	1.016
D	0.213	0.245	5.41	6.22	L5	0.045	0.060	1.14	1.52
D1	0.205	-	5.21	-	θ1°	0°	10°	0°	10°
E	0.250	0.265	6.35	6.73	θ°	0°	15°	0°	15°
E1	0.170	-	4.32	-	-	-	-	-	-

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

Europe
Zetex GmbH
Kustermann-park
Balanstraße 59
D-81541 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

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