

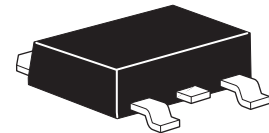
# ZXMN7A11K

## 70V N-channel enhancement mode MOSFET

### Summary

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

$I_D=6.1A$

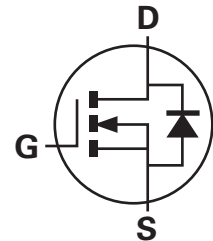


### Description

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.

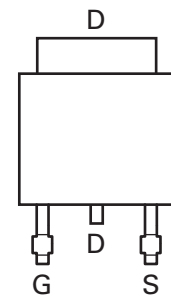
### Features

- 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

# ZXMN7A11K

## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-source voltage	$V_{DSS}$	70	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)	$I_D$	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 $T_A = 25^\circ C$ (a) Linear derating factor	$P_D$	4.06 32.4	W mW/ $^\circ C$
Power dissipation at $T_A = 25^\circ C$ (b) Linear derating factor	$P_D$	8.5 68	W mW/ $^\circ C$
Power dissipation at $T_A = 25^\circ C$ (d) Linear derating factor	$P_D$	2.11 16.8	W mW/ $^\circ C$
Operating and storage temperature range	$T_j, T_{stg}$	-55 to +150	$^\circ C$

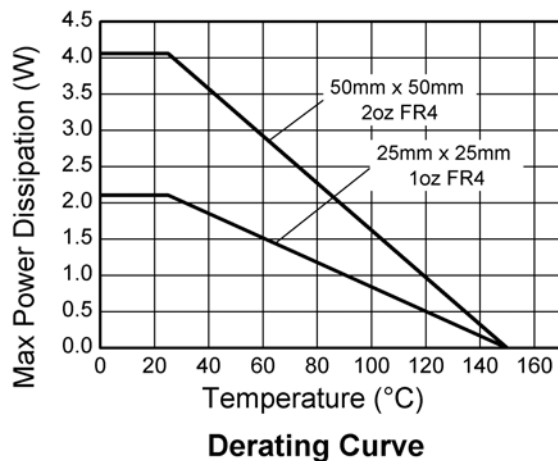
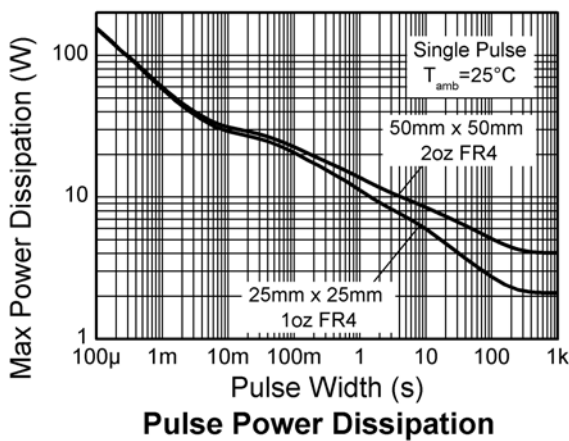
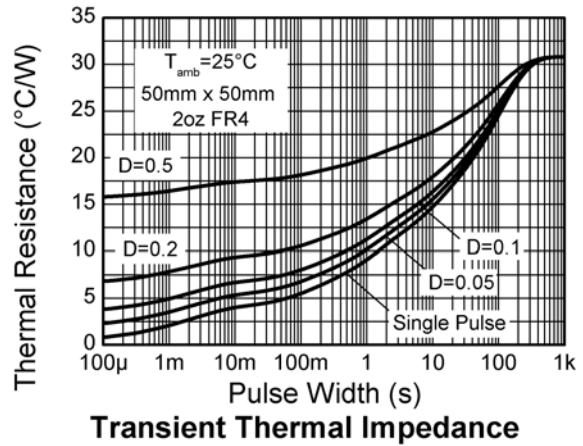
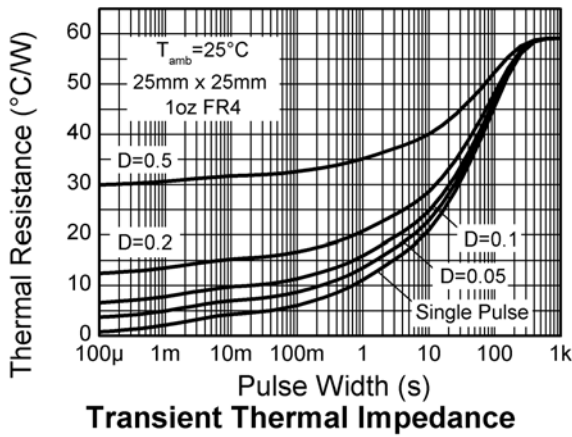
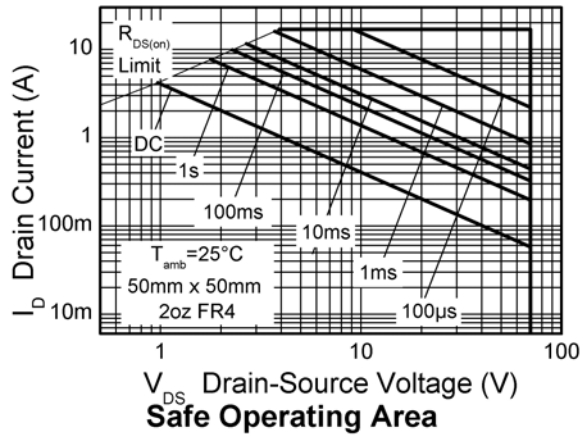
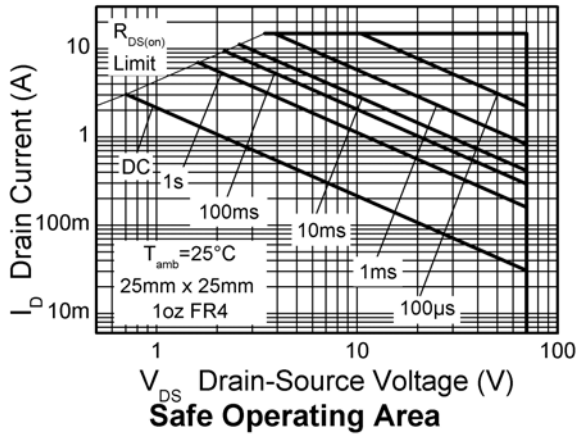
## Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient	$R_{\theta JA}$	30.8	$^\circ C/W$
Junction to ambient	$R_{\theta JA}$	14.7	$^\circ C/W$
Junction to ambient	$R_{\theta JA}$	59.1	$^\circ C/W$

### 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=300 $\mu s$  - 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.

## Characteristics



# ZXMN7A11K

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
<b>Static</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	70			V	$I_D = 250\mu A, V_{GS} = 0V$
Zero gate voltage drain current	$I_{DSS}$			1	$\mu A$	$V_{DS} = 70V, V_{GS} = 0V$
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 <sup>(*)</sup>	$R_{DS(on)}$			0.13	$\Omega$	$V_{GS} = 10V, I_D = 4.4A$
				0.19	$\Omega$	$V_{GS} = 4.5V, I_D = 3.8A$
Forward transconductance <sup>(*)(‡)</sup>	$g_{fs}$		4.66		S	$V_{DS} = 15V, I_D = 4.4A$
<b>Dynamic<sup>(‡)</sup></b>						
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	
<b>Switching<sup>(†) (‡)</sup></b>						
Turn-on-delay time	$t_{d(on)}$		1.9		ns	$V_{DD} = 35V, I_D = 1A$ $R_G \approx 6.0\Omega, V_{GS} = 10V$
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	
<b>Source-drain diode</b>						
Diode forward voltage <sup>(*)</sup>	$V_{SD}$		0.85	0.95	V	$T_j = 25^\circ C, I_S = 2.5A,$ $V_{GS} = 0V$
Reverse recovery time <sup>(‡)</sup>	$t_{rr}$		19.8		ns	$T_j = 25^\circ C, I_S = 2.5A,$ $di/dt = 100A/\mu s$
Reverse recovery charge <sup>(‡)</sup>	$Q_{rr}$		14		nC	

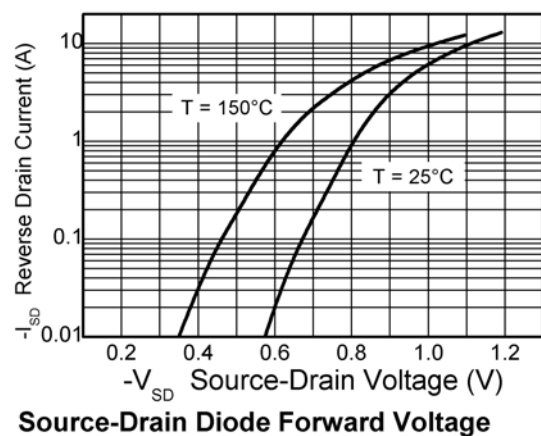
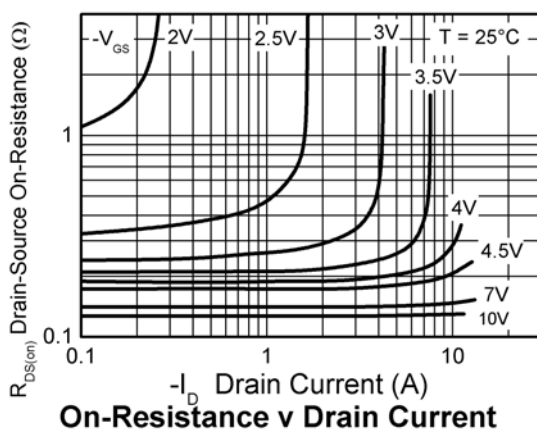
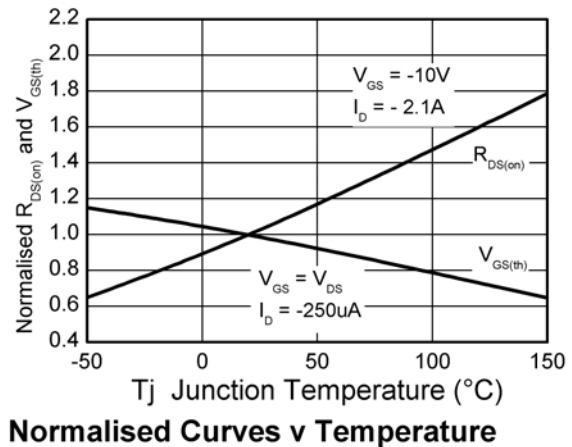
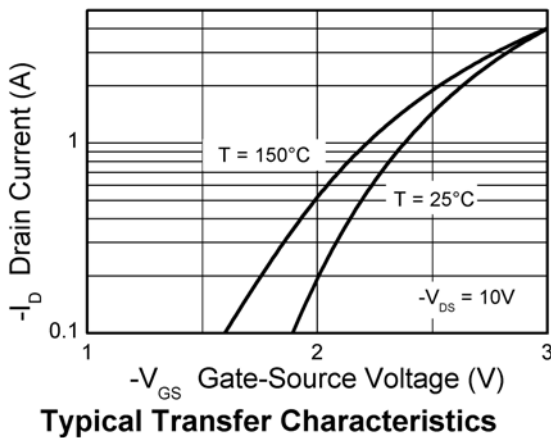
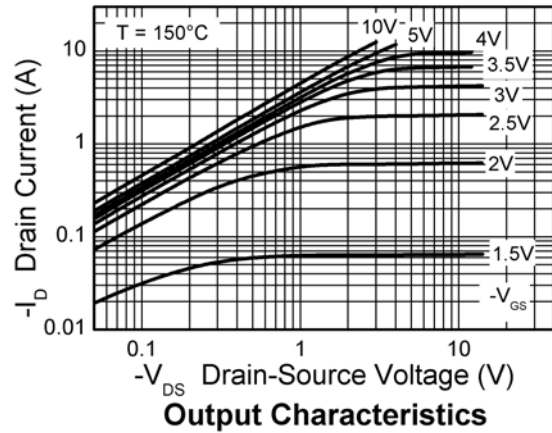
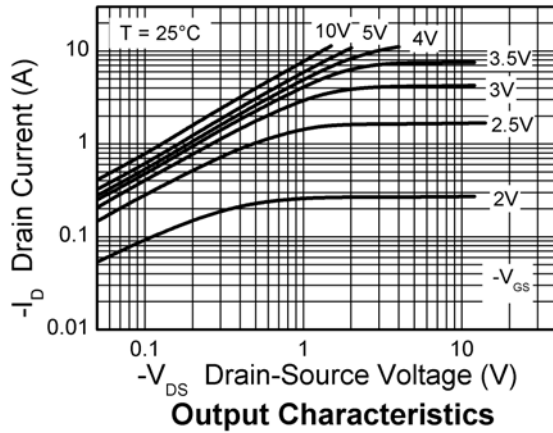
### NOTES:

(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .

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

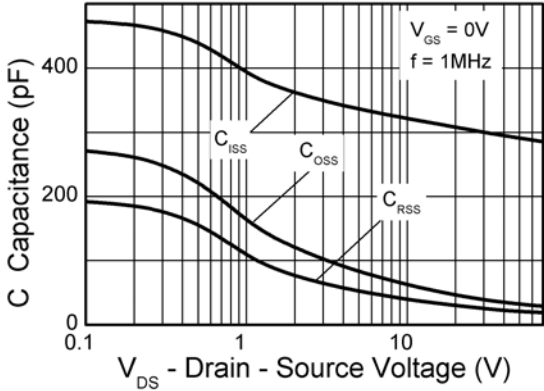
(‡) For design aid only, not subject to production testing.

## Typical characteristics

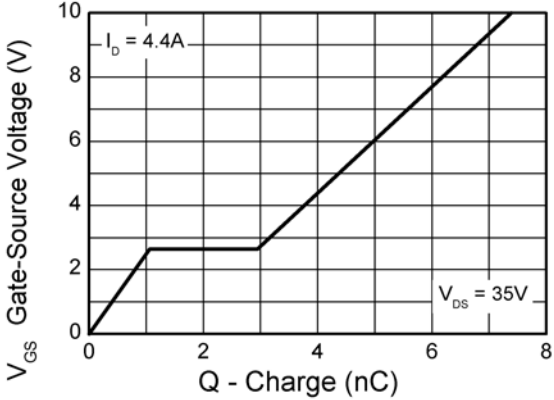


# ZXMN7A11K

## Typical characteristics



Capacitance v Drain-Source Voltage



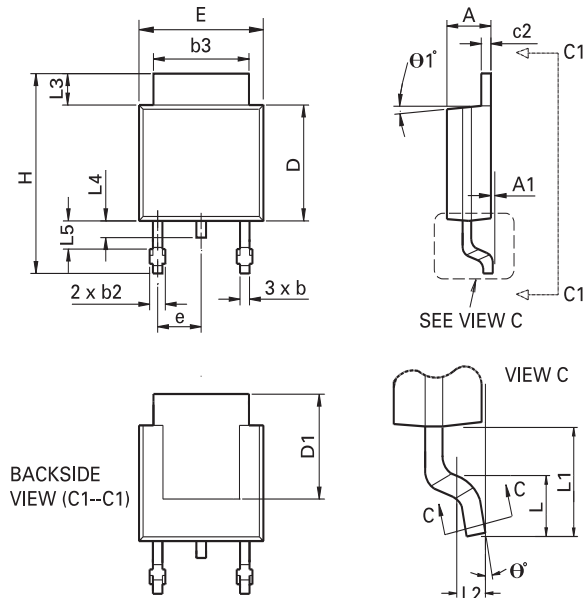
Gate-Source Voltage v Gate Charge

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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	-	theta 1°	0°	10°	0°	10°
E	0.250	0.265	6.35	6.73	theta 0°	0°	15°	0°	15°
E1	0.170	-	4.32	-	-	-	-	-	-

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

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