

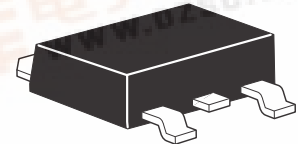


ZXMN10A11K

100V DPAK N-channel enhancement mode MOSFET

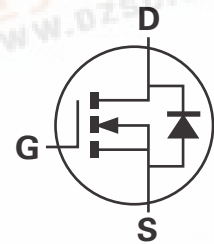
Summary

V _{(BR)DSS}	R _{DS(on)} (Ω)	I _D (A)
100	0.350 @ V _{GS} = 10V	3.5
	0.450 @ V _{GS} = 6V	3.1



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.

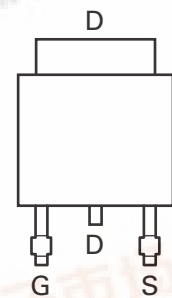


Features

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- DPAK 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
ZXMN10A11KTC	13	16	2,500

Device marking

ZXMN
10A11

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Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DSS}	100	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current @ $V_{GS} = 10V$; $T_{amb} = 25^{\circ}C^{(b)}$ @ $V_{GS} = 10V$; $T_{amb} = 70^{\circ}C^{(b)}$ @ $V_{GS} = 10V$; $T_{amb} = 25^{\circ}C^{(a)}$	I_D	3.5 2.8 2.4	A
Pulsed drain current ^(c)	I_{DM}	9.9	A
Continuous source current (body diode) ^(b)	I_S	8.35	A
Pulsed source current (body diode) ^(c)	I_{SM}	9.9	A
Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$ Linear derating factor	P_D	4.06 32.4	W mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$ Linear derating factor	P_D	8.5 68	W mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$ 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

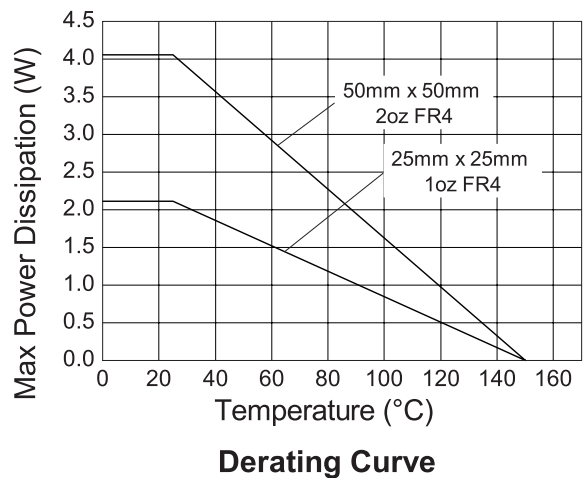
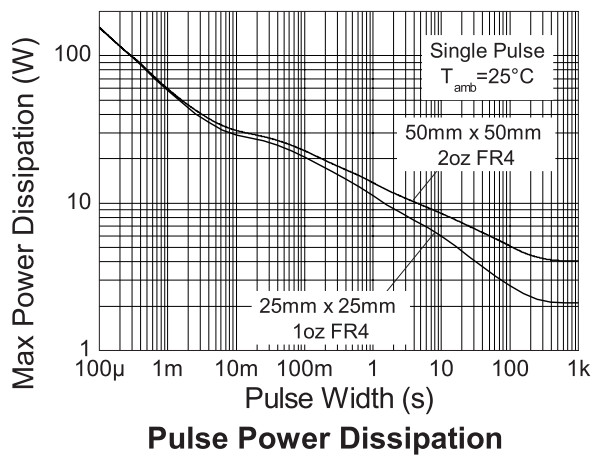
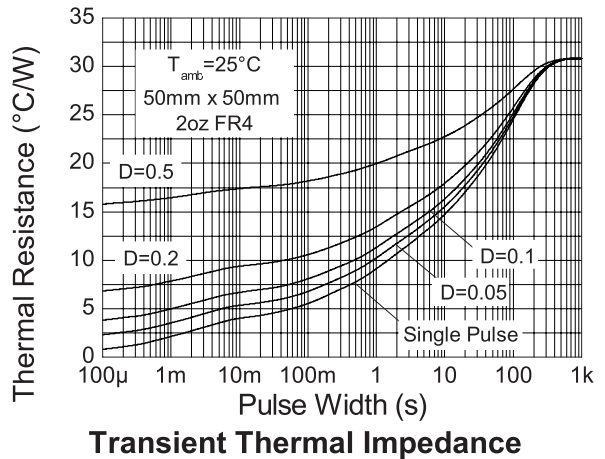
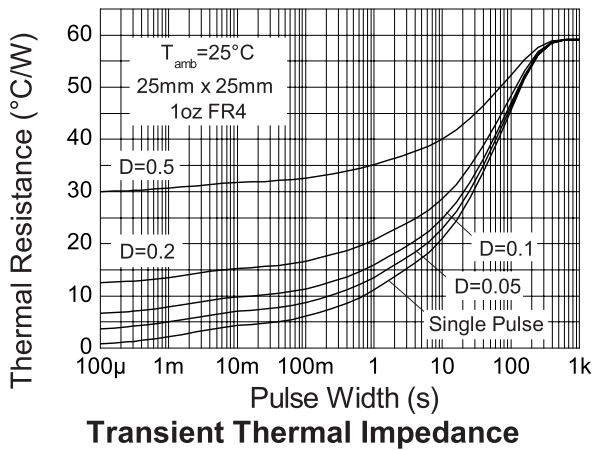
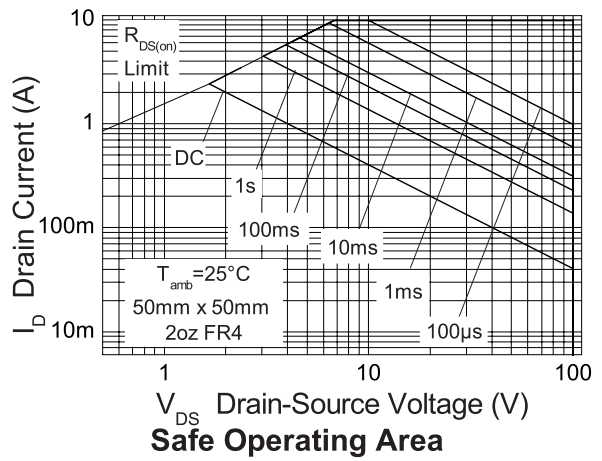
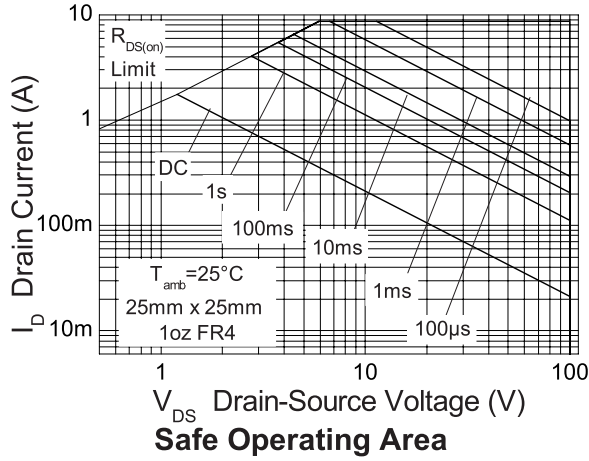
Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	30.8	$^{\circ}C/W$
Junction to ambient ^(b)	$R_{\theta JA}$	14.7	$^{\circ}C/W$
Junction to ambient ^(d)	$R_{\theta JA}$	59.1	$^{\circ}C/W$

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 μs - 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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Thermal characteristics



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Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	100			V	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero gate voltage drain current	I_{DSS}			1	μA	$V_{DS} = 100\text{V}$, $V_{GS} = 0\text{V}$
Gate-body leakage	I_{GSS}			100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
Gate-source threshold voltage	$V_{GS(th)}$	2.0		4.0	V	$I_D = 250\mu\text{A}$, $V_{DS} = V_{GS}$
Static drain-source on-state resistance (*)	$R_{DS(on)}$			0.350	Ω	$V_{GS} = 10\text{V}$, $I_D = 2.6\text{A}$
				0.450	Ω	$V_{GS} = 6\text{V}$, $I_D = 1.3\text{A}$
Forward transconductance(*) (‡)	g_{fs}		4		S	$V_{DS} = 15\text{V}$, $I_D = 2.6\text{A}$
Dynamic(‡)						
Input capacitance	C_{iss}		274		pF	$V_{DS} = 50\text{V}$, $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output capacitance	C_{oss}		21		pF	
Reverse transfer capacitance	C_{rss}		11		pF	
Switching (†) (‡)						
Turn-on-delay time	$t_{d(on)}$		2.7		ns	$V_{DD} = 50\text{V}$, $I_D = 1\text{A}$ $R_G \approx 6.0\Omega$, $V_{GS} = 10\text{V}$
Rise time	t_r		1.7		ns	
Turn-off delay time	$t_{d(off)}$		7.4		ns	
Fall time	t_f		3.5		ns	
Gate charge	Q_g		3		nC	$V_{DS} = 50\text{V}$, $V_{GS} = 5\text{V}$ $I_D = 2.5\text{A}$
Total gate charge	Q_g		5.4		nC	$V_{DS} = 50\text{V}$, $V_{GS} = 10\text{V}$ $I_D = 2.5\text{A}$
Gate-source charge	Q_{gs}		1.4		nC	
Gate drain charge	Q_{gd}		1.5		nC	
Source-drain diode						
Diode forward voltage(*)	V_{SD}		0.85	0.95	V	$T_j = 25^{\circ}\text{C}$, $I_S = 1.85\text{A}$, $V_{GS} = 0\text{V}$
Reverse recovery time (‡)	t_{rr}		26		ns	$T_j = 25^{\circ}\text{C}$, $I_S = 1\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$
Reverse recovery charge(‡)	Q_{rr}		30		nC	

NOTES:

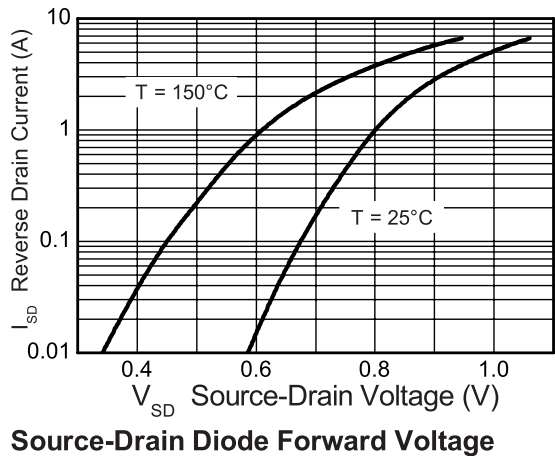
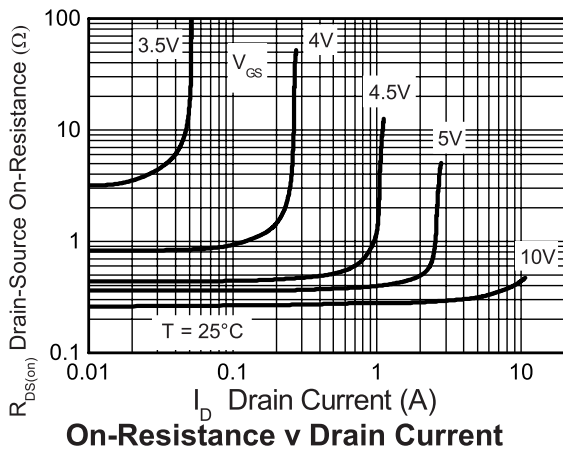
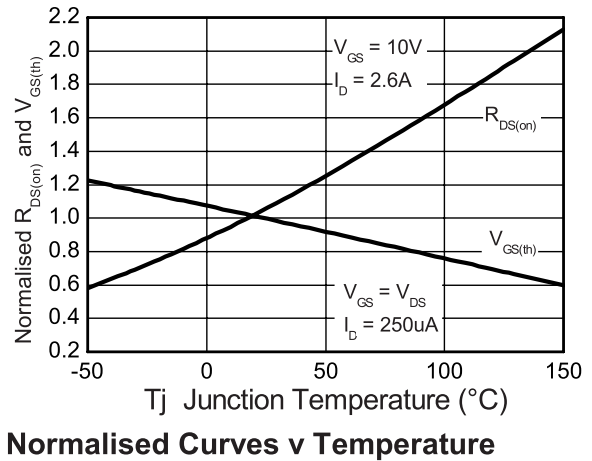
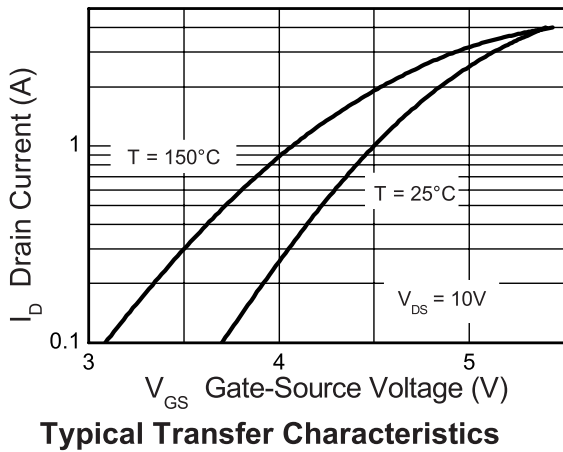
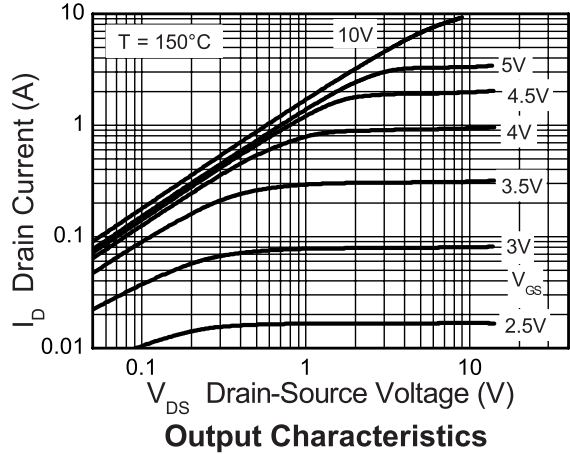
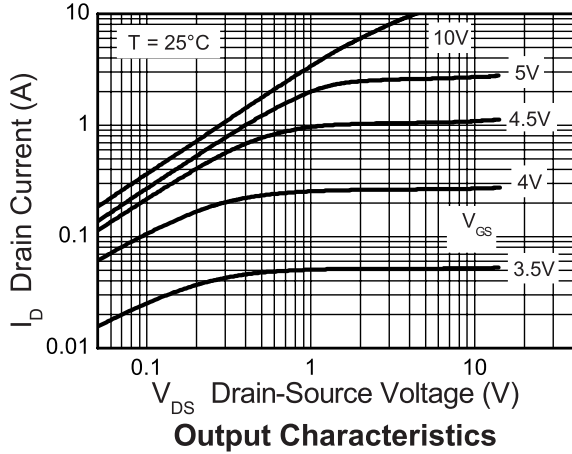
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

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

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

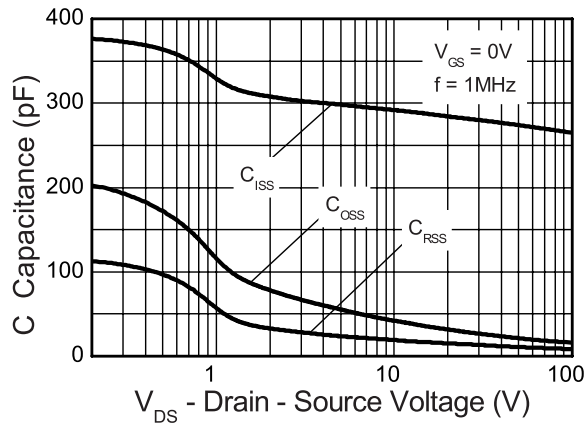
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Typical Characteristics

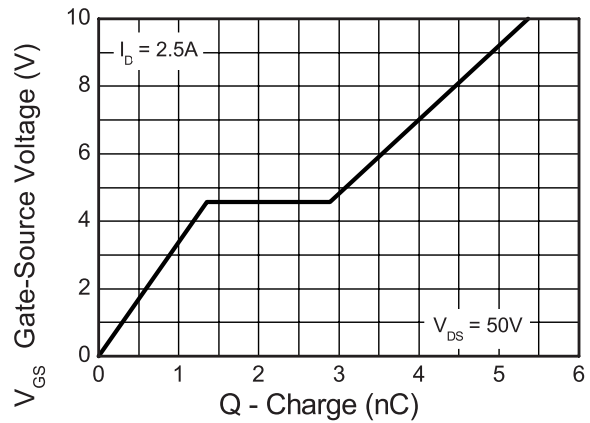


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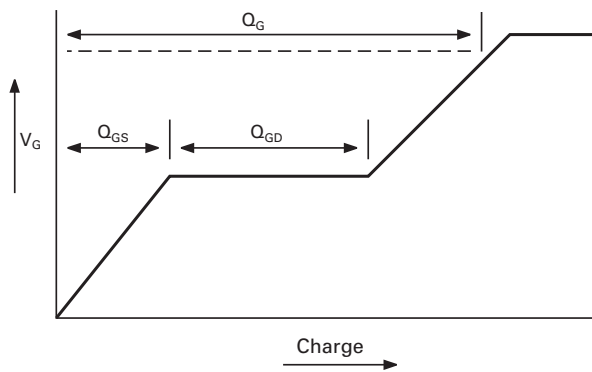
Typical Characteristics



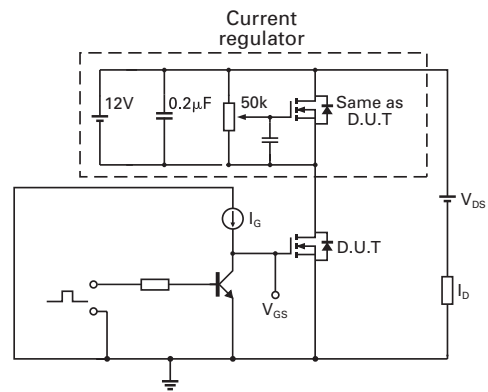
Capacitance v Drain-Source Voltage



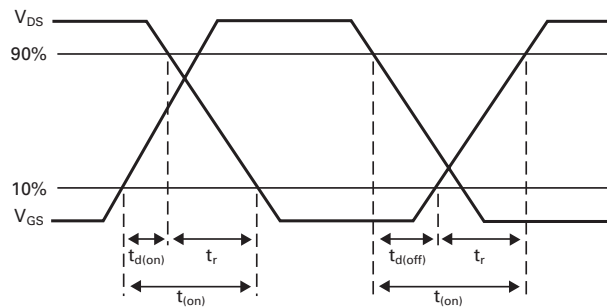
Gate-Source Voltage v Gate Charge



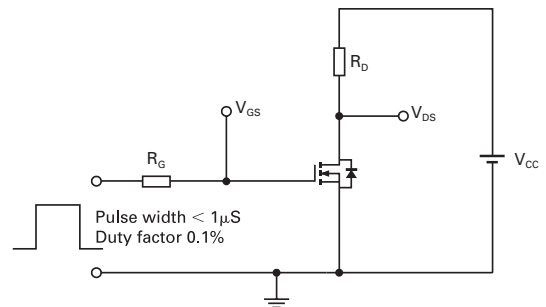
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



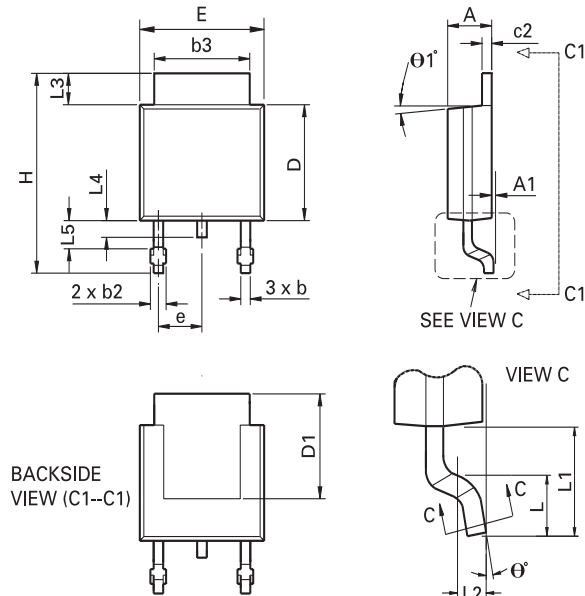
Switching time test circuit

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Package outline - 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°	15°	0°	15°
E1	0.170	-	4.32	-	-	-	-	-	-

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

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