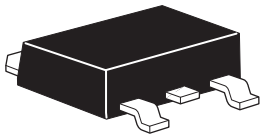
ZXMP10A16K
100V DPAK P-channel enhancement mode MOSFET

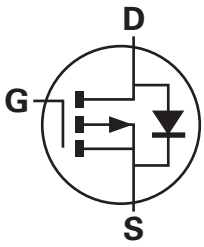
Summary



$V_{(BR)DSS}$	$R_{DS(on)}$ (Ω)	I_D (A)
-100	0.235 @ V_{GS}= -10V	4.6
	0.285 @ V_{GS}= -6V	4.2

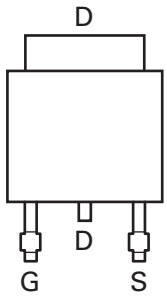
Description

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



Pinout - top view

Applications

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

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP10A16KTC	13	16	2500

Device marking

ZXMP
10A16

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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°C(b)	I_D	4.6	A
@ V_{GS}= 10V; T_{amb}=70°C(b)		3.7	
@ V_{GS}= 10V; T_{amb}=25°C(a)		3	
Pulsed drain current(c)	I_{DM}	15.4	A
Continuous source current (body diode)(b)	I_S	10.6	A
Pulsed source current (body diode)(c)	I_{SM}	15.4	A
Power dissipation at T_{amb} =25°C(a)	P_D	4.24	W
Linear derating factor		34	mW/°C
Power dissipation at T_{amb} =25°C(b)	P_D	9.76	W
Linear derating factor		78	mW/°C
Power dissipation at T_{amb} =25°C(d)	P_D	2.15	W
Linear derating factor		16.8	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)	$R_{\Theta JA}$	29.45	°C/W
Junction to ambient(b)	$R_{\Theta JA}$	12.8	°C/W
Junction to ambient(d)	$R_{\Theta JA}$	58.1	°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.

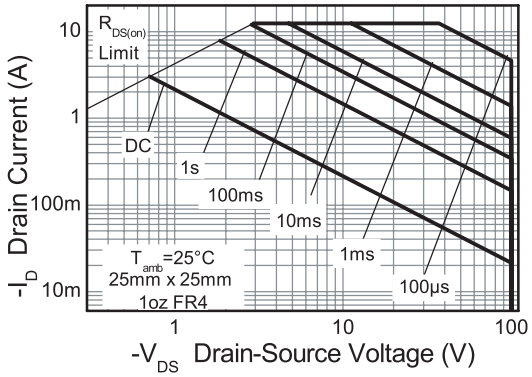
(b) For a device surface mounted on FR4 PCB measured at t ≤10 sec.

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

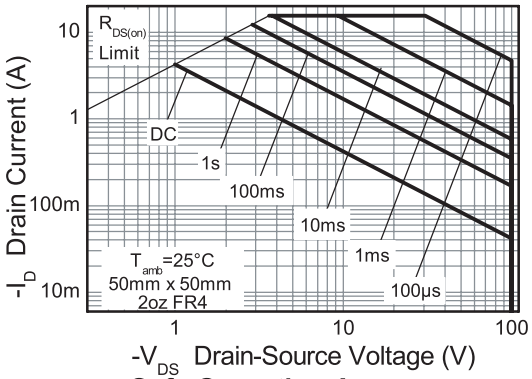
(d) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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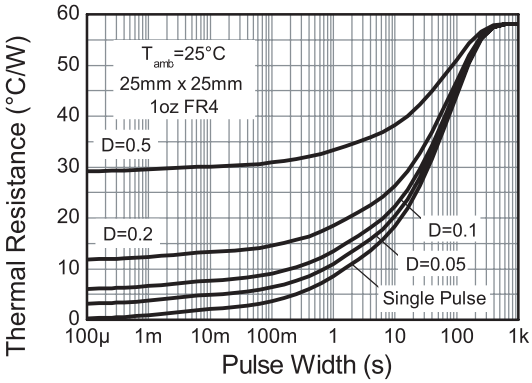
Typical characteristics



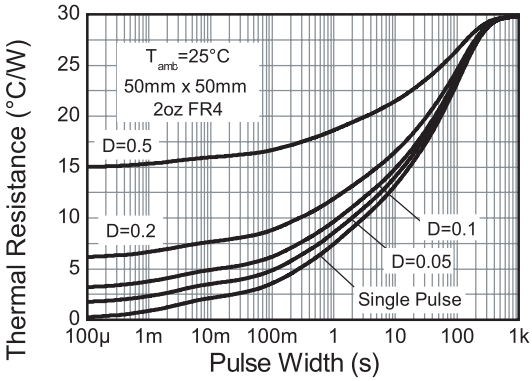
Safe Operating Area



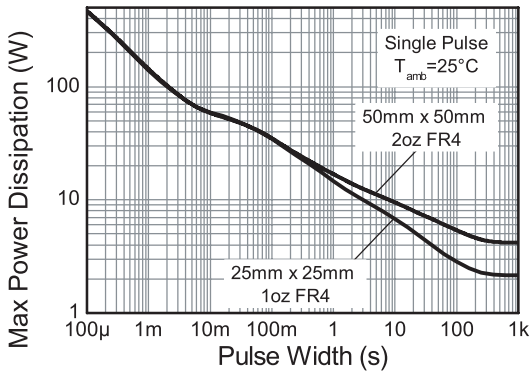
Safe Operating Area



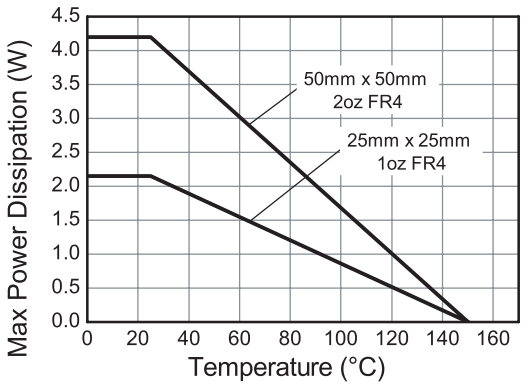
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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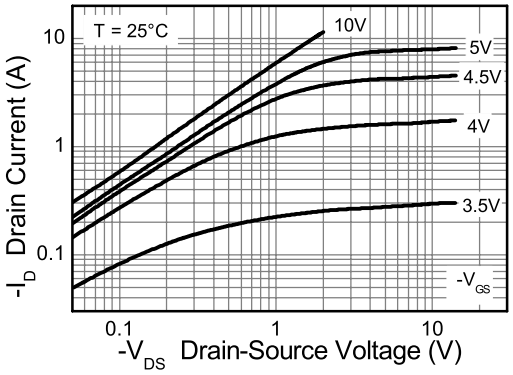
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	-100			V	I_D= 250μA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}			-1	μA	V_{DS}= -100V, V_{GS}=0V
Gate-body leakage	I_{GSS}			100	nA	V_{GS}=±20V, V_{DS}=0V
Gate-source threshold voltage	$V_{GS(th)}$	-2.0		-4.0	V	I_D= -250μA, V_{DS}=V_{GS}
Static drain-source on-state resistance (*)	$R_{DS(on)}$			0.235 0.285	W	V_{GS}= -10V, I_D= -2.1A V_{GS}= -6V, I_D= -1.9A
Forward transconductance(*) (‡)	g_{fs}		4.7		S	V_{DS}= -15V, I_D= -2.1A
Dynamic(‡)						
Input capacitance	C_{iss}		717		pF	V_{DS}= -50V, V_{GS}=0V f=1MHz
Output capacitance	C_{oss}		55.3		pF	
Reverse transfer capacitance	C_{rss}		46.4		pF	
Switching (†) (‡)						
Turn-on-delay time	$t_{d(on)}$		4.3		ns	V_{DD}= -50V, I_D= -1A R_G=6.0Ω, V_{GS}= -10V
Rise time	t_r		5.2		ns	
Turn-off delay time	$t_{d(off)}$		20		ns	
Fall time	t_f		12.1		ns	
Total gate charge	Q_g		16.5		nC	V_{DS}= -50V, V_{GS}= -10V I_D= -2.1A
Gate-source charge	Q_{gs}		2.47		nC	
Gate drain charge	Q_{gd}		5.36		nC	
Source-drain diode						
Diode forward voltage(*)	V_{SD}		-0.85	-0.95	V	T_j=25°C, I_S= -3.35A, V_{GS}=0V
Reverse recovery time(‡)	t_{rr}		43.3		ns	T_j=25°C, I_S= -2.4A, di/dt=100A/μs
Reverse recovery charge(‡)	Q_{rr}		76.5		nC	

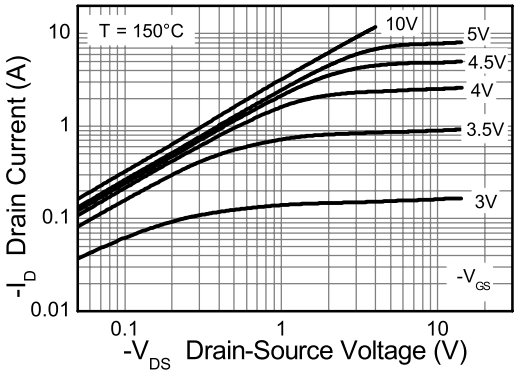
NOTES:
(*) Measured under pulsed conditions. Pulse width ≤300μs; duty cycle ≤2%.
(†) Switching characteristics are independent of operating junction temperature.
(‡) For design aid only, not subject to production testing.

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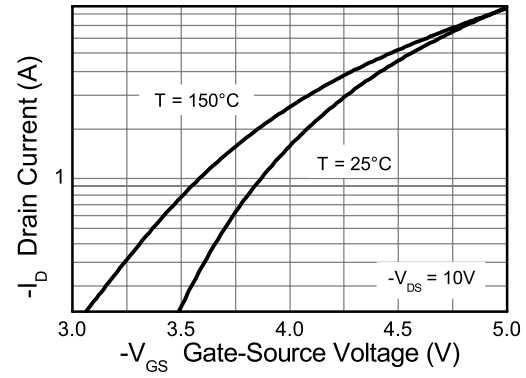
Typical characteristics



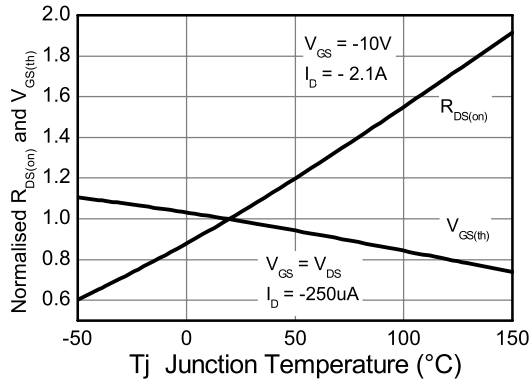
Output Characteristics



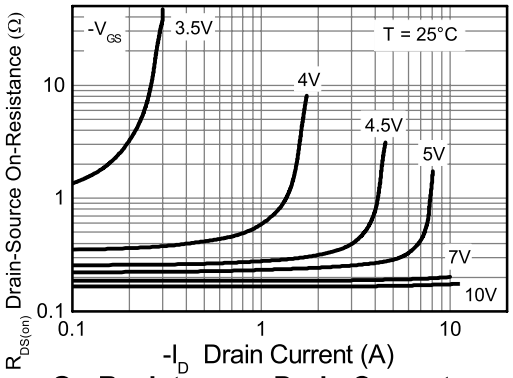
Output Characteristics



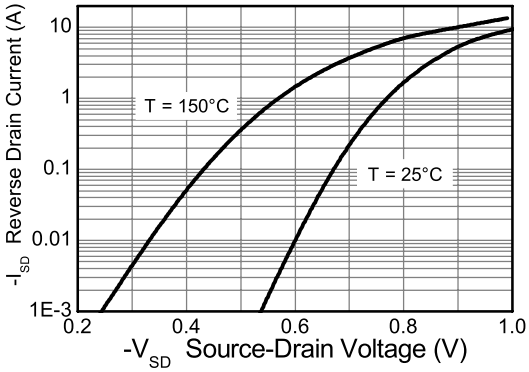
Typical Transfer Characteristics



Normalised Curves v Temperature



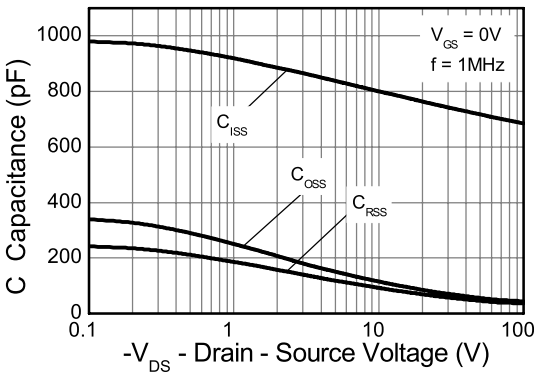
On-Resistance v Drain Current



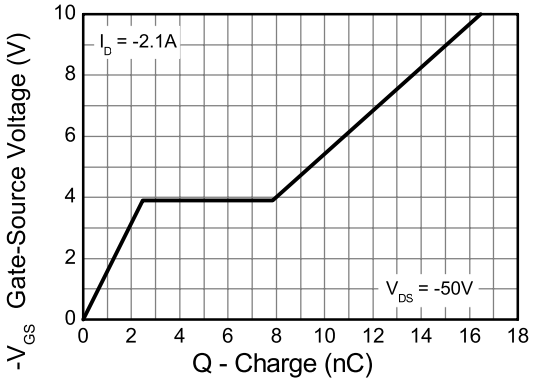
Source-Drain Diode Forward Voltage

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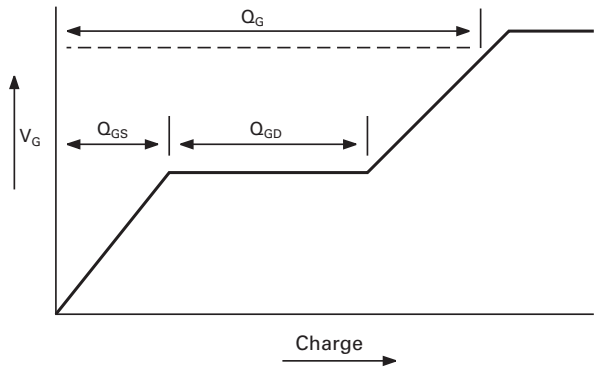
Typical characteristics



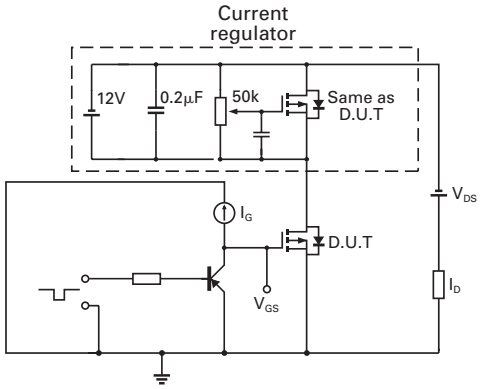
Capacitance v Drain-Source Voltage



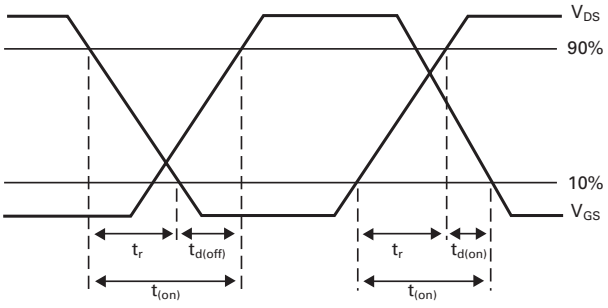
Gate-Source Voltage v Gate Charge



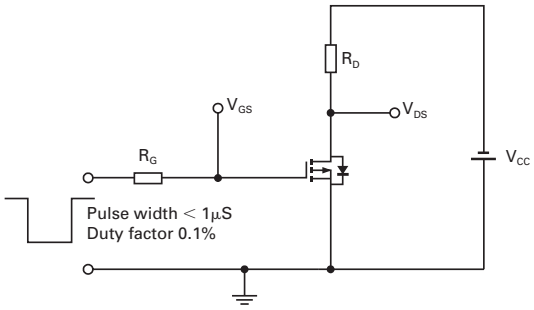
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



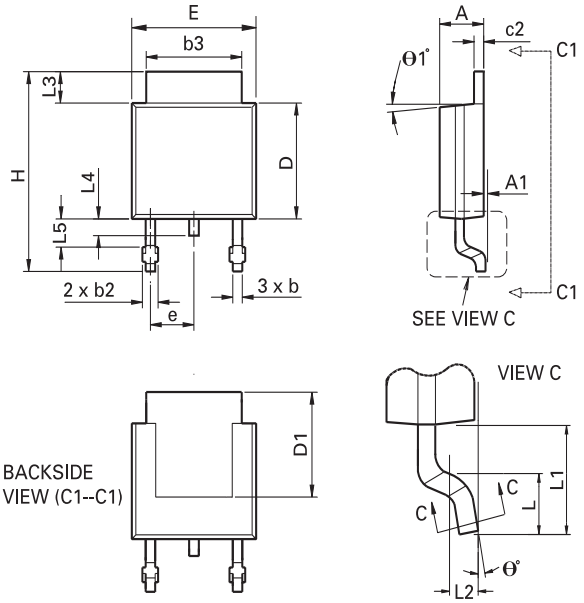
Switching time test circuit

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Package details - 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

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