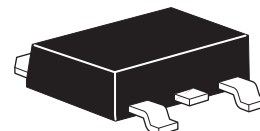


ZXMP10A16K

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

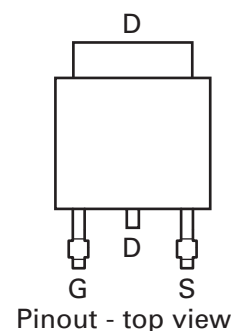
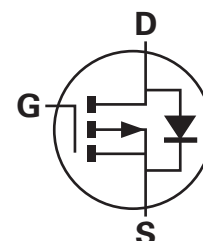
This new generation trench MOSFET from Zetex features a unique structure combining the benefits of low on-resistance and fast switching, making it ideal for high efficiency power management applications.

Features

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

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

ZXMP10A16K

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	4.6 3.7 3	A
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 $T_{amb} = 25^{\circ}C^{(a)}$ Linear derating factor	P_D	4.24 34	W mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$ Linear derating factor	P_D	9.76 78	W mW/ $^{\circ}C$
Power dissipation at $T_{amb} = 25^{\circ}C^{(d)}$ Linear derating factor	P_D	2.15 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)	$R_{\theta JA}$	29.45	$^{\circ}C/W$
Junction to ambient ^(b)	$R_{\theta JA}$	12.8	$^{\circ}C/W$
Junction to ambient ^(d)	$R_{\theta JA}$	58.1	$^{\circ}C/W$

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.

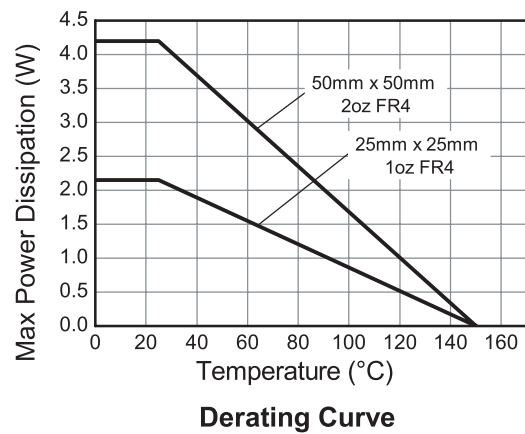
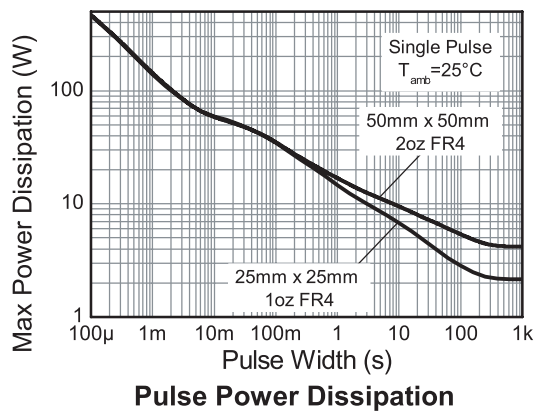
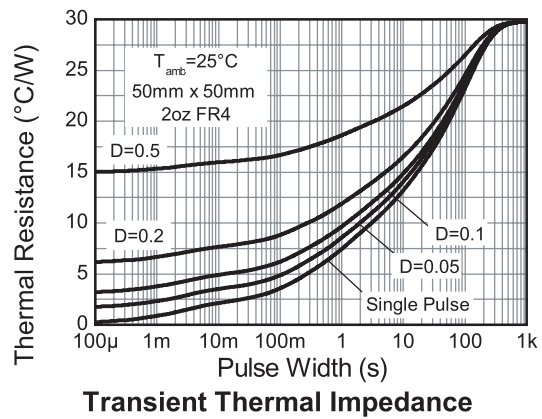
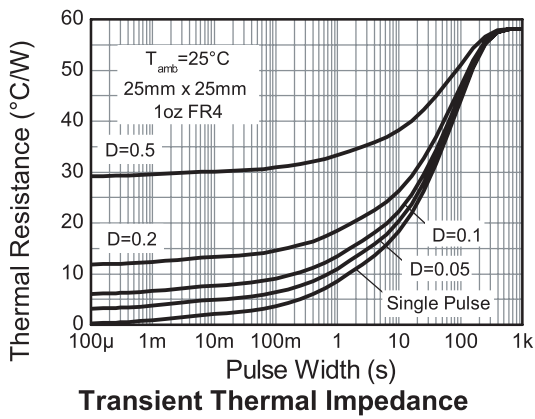
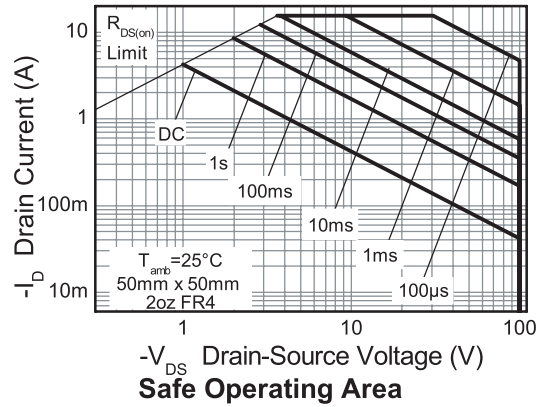
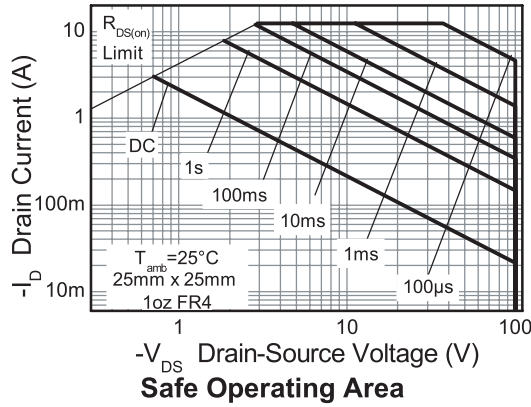
(b) For a device surface mounted on FR4 PCB measured at $t \leq 10$ sec.

(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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Typical 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 = 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:

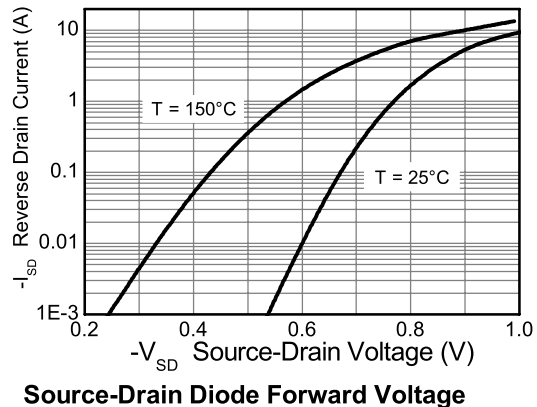
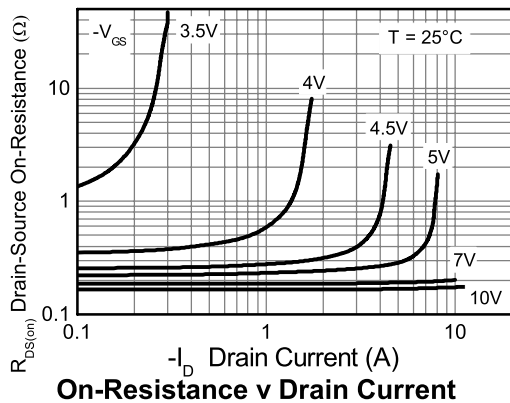
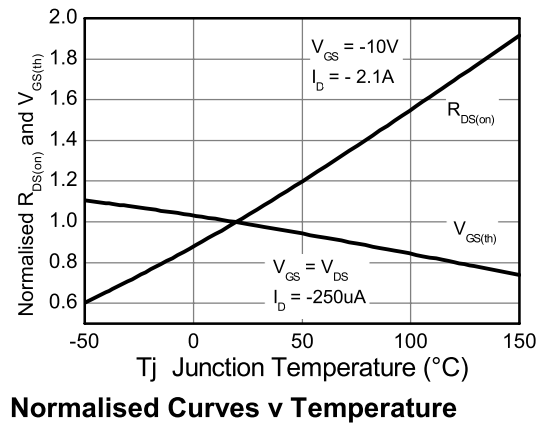
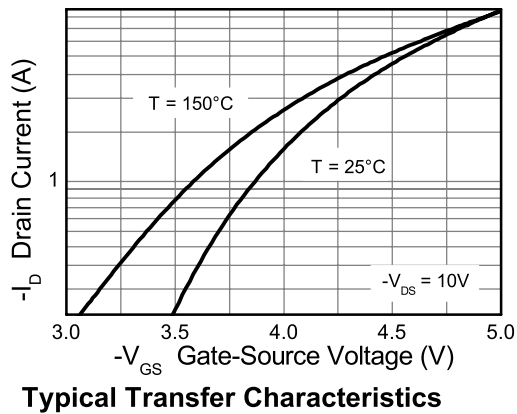
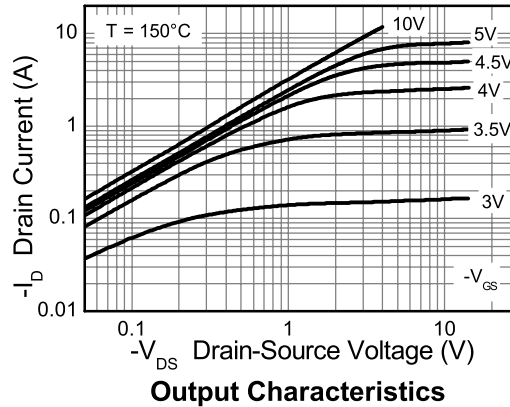
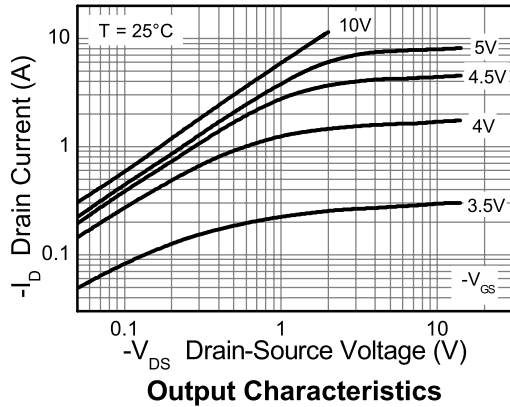
(*) Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

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

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

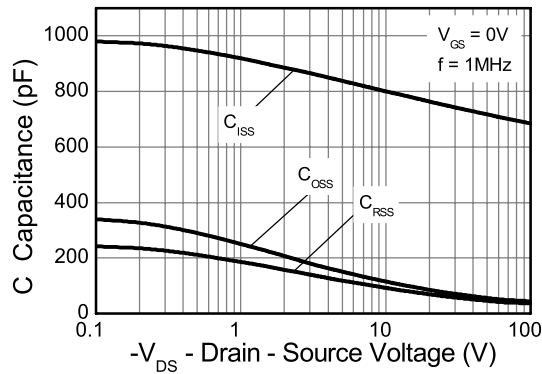
ZXMP10A16K

Typical characteristics

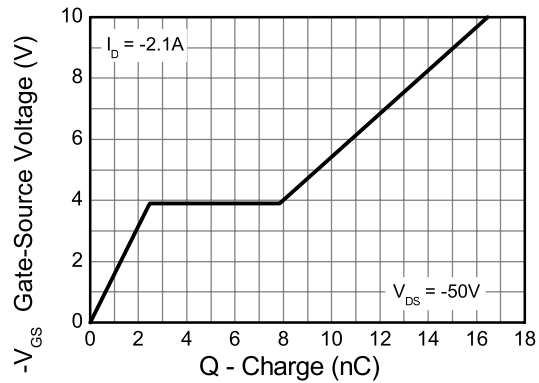


ZXMP10A16K

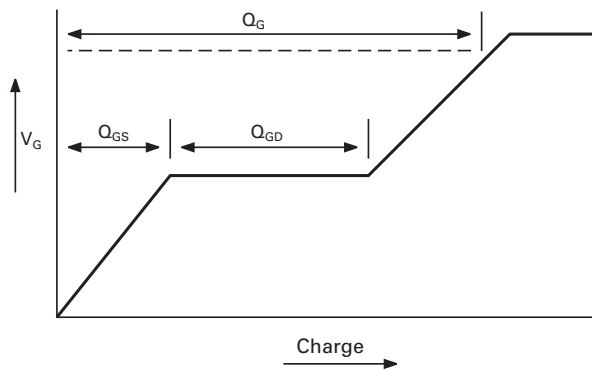
Typical characteristics



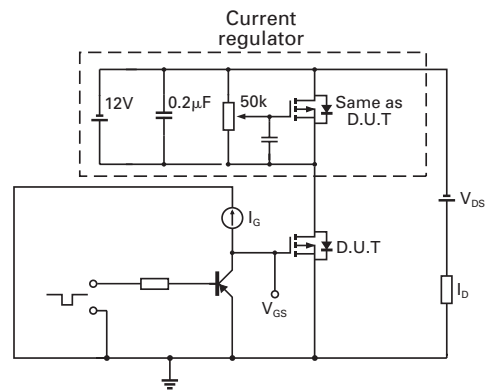
Capacitance v Drain-Source Voltage



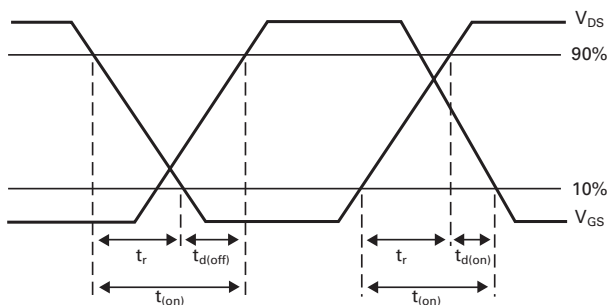
Gate-Source Voltage v Gate Charge



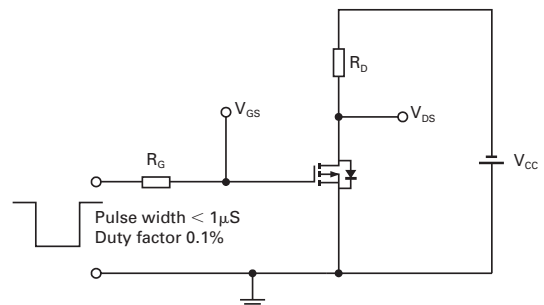
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



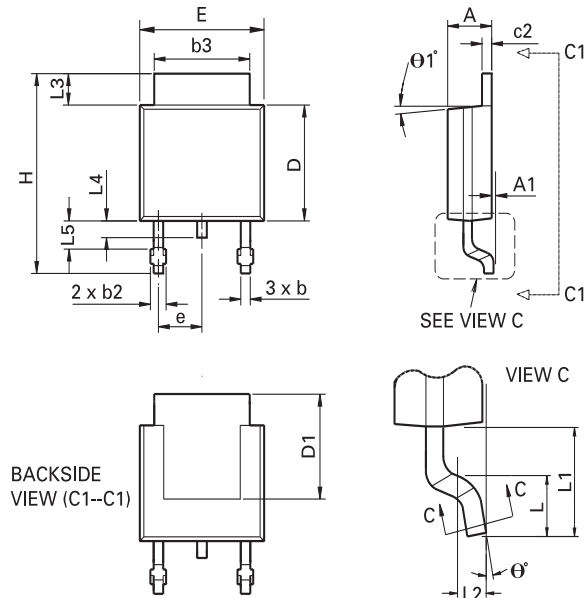
Switching time test circuit

ZXMP10A16K

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ZXMP10A16K

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	-	theta1°	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

Europe	Americas	Asia Pacific	Corporate Headquarters
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	Zetex Inc 700 Veterans Memorial Highway Hauppauge, NY 11788 USA Telephone: (1) 631 360 2222 Fax: (1) 631 360 8222 usa.sales@zetex.com	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	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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