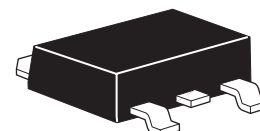


ZXMP4A16K

40V P-channel enhancement mode MOSFET

Summary

$V_{(BR)DSS} = -40V$; $R_{DS(ON)} = 0.060\Omega$ $I_D = -9.9A$

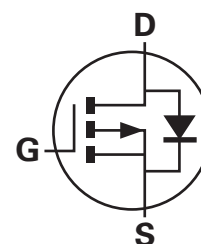


Description

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

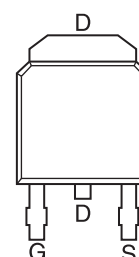
- DC - DC converters
- Audio output stages
- Relay and solenoid driving
- Motor control

Ordering information

Device	Reel size (inches)	Tape width	Quantity per reel
ZXMP4A16KTC	13	16mm	2500 units

Device marking

ZXMP
4A16



Pinout - Top view

ZXMP4A16K

Absolute maximum rating

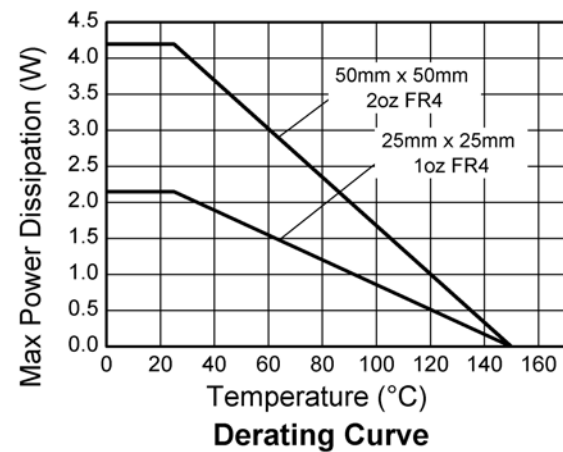
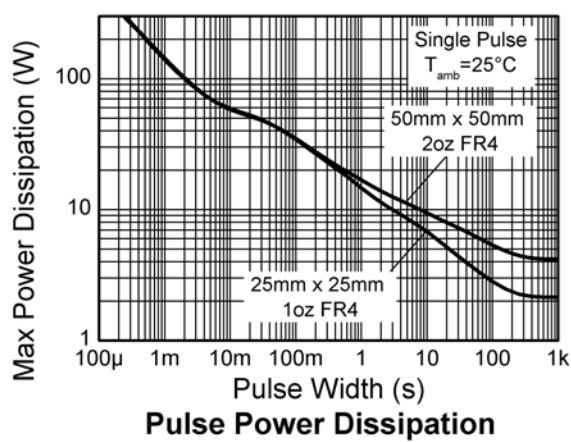
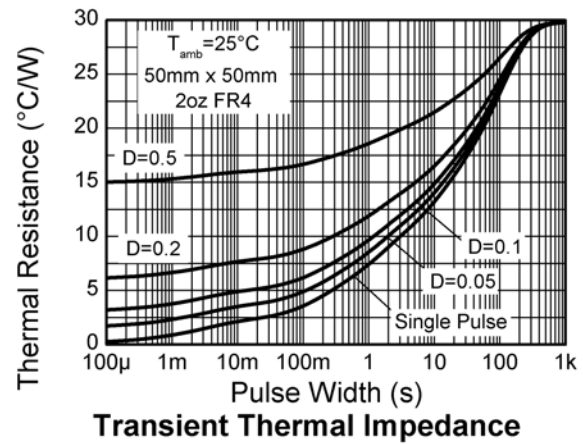
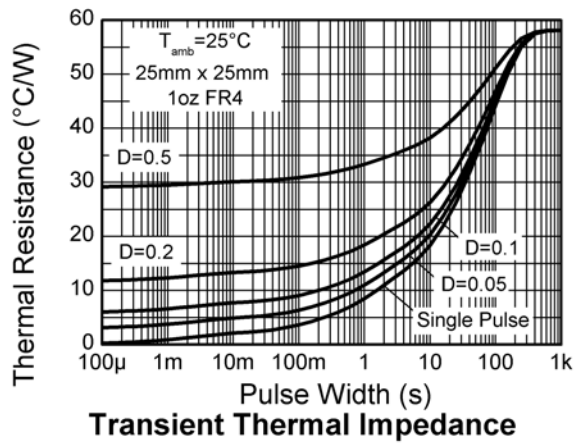
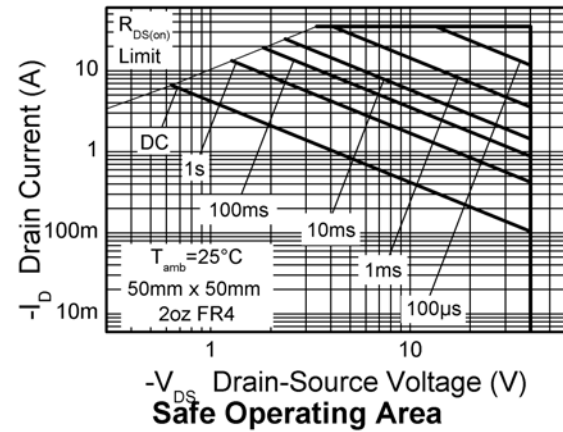
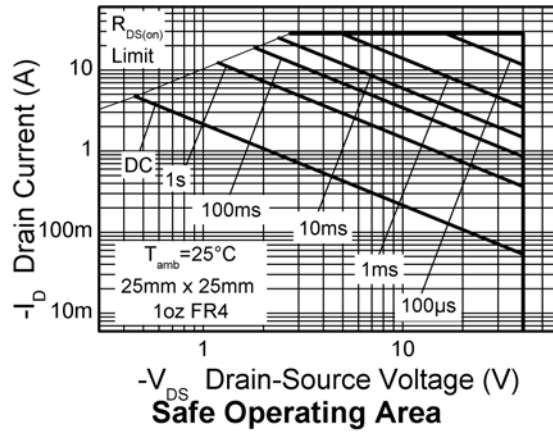
Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DSS}	-40	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current $V_{GS} = -10V$; $T_A = 25^\circ C$ ^(b) $V_{GS} = -10V$; $T_A = 70^\circ C$ ^(b) $V_{GS} = -10V$; $T_A = 25^\circ C$ ^(a)	I_D	-9.9 -8.0 -6.6	A A A
Pulsed drain current ^(c)	I_{DM}	-35	A
Continuous source current (body diode) ^(b)	I_S	-10.1	A
Pulsed source current (body diode) ^(c)	I_{SM}	-35	A
Power dissipation at $T_A = 25^\circ C$ ^(a) Linear derating factor	P_D	4.2 33.6	W mW/°C
Power dissipation at $T_A = 25^\circ C$ ^(b) Linear derating factor	P_D	9.5 76	W mW/°C
Power dissipation at $T_A = 25^\circ C$ ^(d) Linear derating factor	P_D	2.15 17.2	W mW/°C
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	°C
Thermal resistance			
Parameter	Symbol	Value	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	30	°C/W
Junction to ambient ^(b)	$R_{\theta JA}$	13.2	°C/W
Junction to ambient ^(d)	$R_{\theta JA}$	58	°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.

ZXMP4A16K

Characteristics



ZXMP4A16K

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Static						
Drain-source breakdown voltage	V _{(BR)DSS}	-40			V	I _D =-250μA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}			-1	μA	V _{DS} =-40V, 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)}			0.060	Ω	V _{GS} =-10V, I _D =-3.8A
				0.100	Ω	V _{GS} =-4.5V, I _D =-2.9A
Forward transconductance ^(*) (‡)	g _{fs}		7.4		S	V _{DS} =-15V,I _D =-3.8A
Dynamic ^(‡)						
Input capacitance	C _{iss}		965		pF	V _{DS} =-20V, V _{GS} =0V, f=1MHz
Output capacitance	C _{oss}		180		pF	
Reverse transfer capacitance	C _{rss}		158		pF	
Switching ^(†) (‡)						
Turn-on delay time	t _{d(on)}		4.0		ns	V _{DD} =-20V, I _D =-1A R _G =6.0Ω,V _{GS} =-10V
Rise time	t _r		6.0		ns	
Turn-off delay time	t _{d(off)}		36.8		ns	
Fall time	t _f		17.1		ns	
Gate charge	Q _g		16.5		nC	V _{DS} =-20V,V _{GS} =-5V, I _D =-3.8A
Total gate charge	Q _g		29.6		nC	V _{DS} =-20V,V _{GS} =-10V, I _D =-3.8A
Gate-source charge	Q _{gs}		2.8		nC	
Gate-drain charge	Q _{gd}		8.1		nC	
Source-drain diode						
Diode forward voltage ^(*)	V _{SD}		-0.89	-1.2	V	T _J =25°C, I _S =-3.8A, V _{GS} =0V
Reverse recovery time ^(‡)	t _{rr}		29.8		ns	T _J =25°C, I _F =-3.8A, di/dt= 100A/μs
Reverse recovery charge ^(‡)	Q _{rr}		37.2		nC	

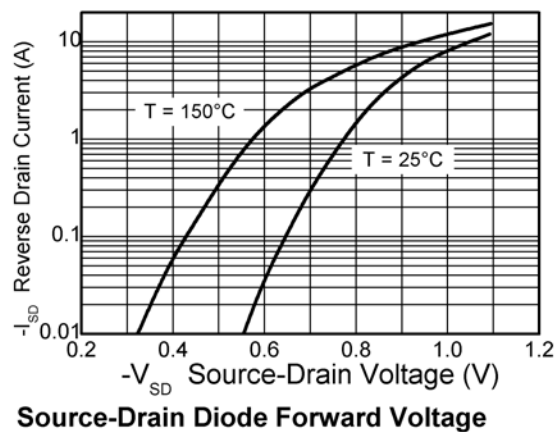
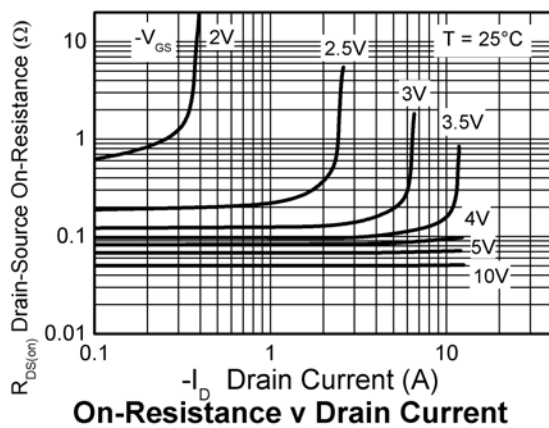
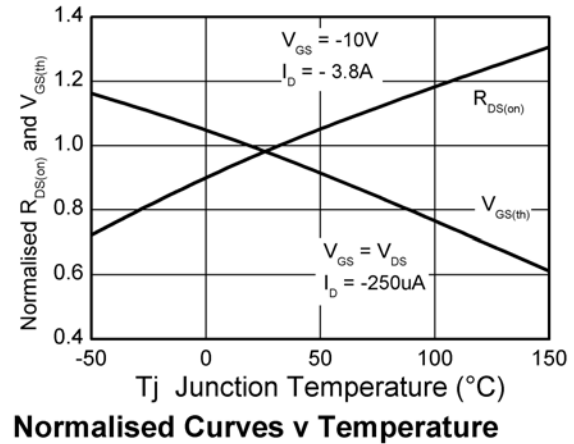
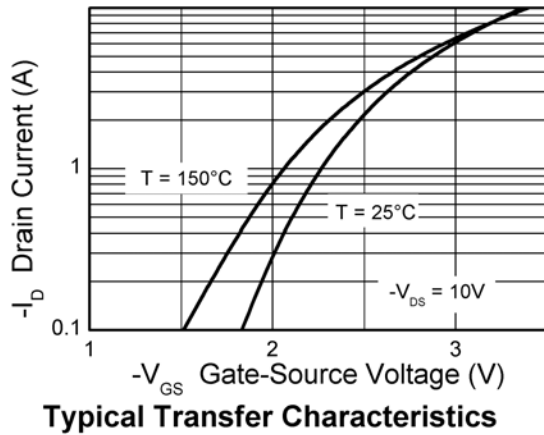
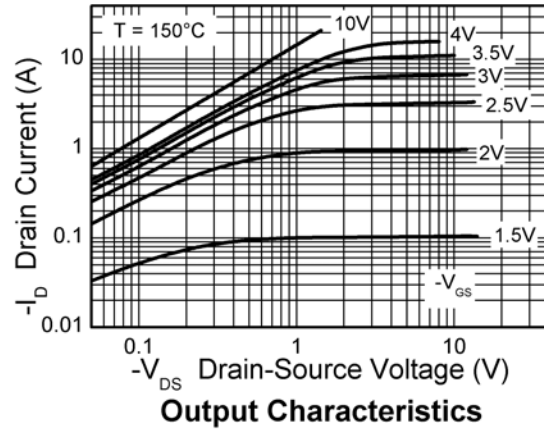
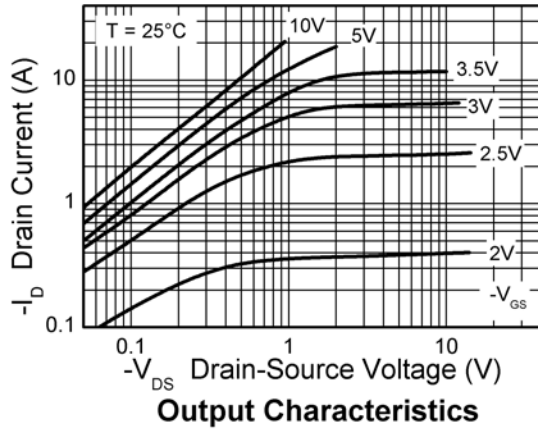
NOTES:

(*) Measured under pulsed conditions. Width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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

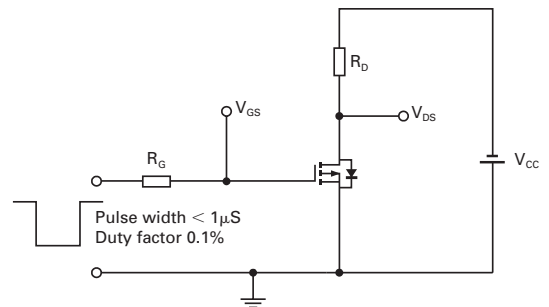
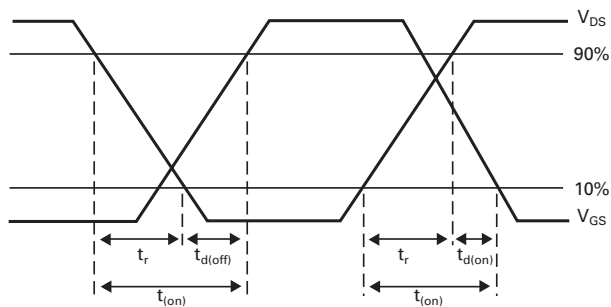
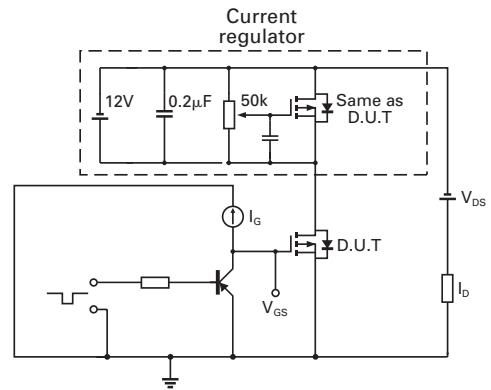
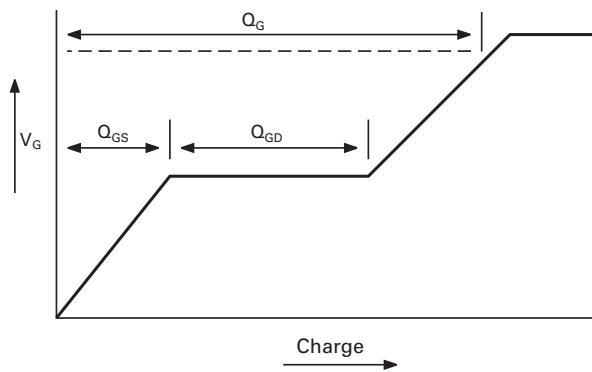
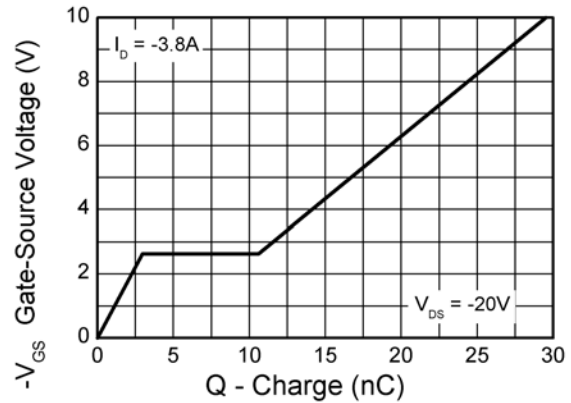
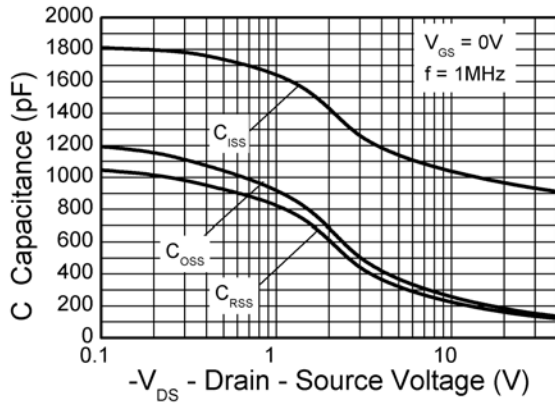
(‡) For design aid only, not subject to production testing.

Typical characteristics



ZXMP4A16K

Typical characteristics

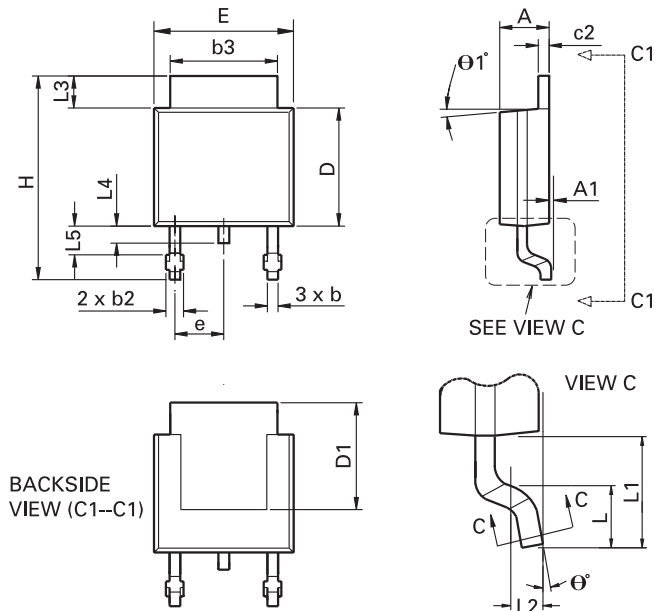


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ZXMP4A16K

Package details - DPAK



Package dimensions

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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