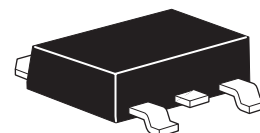


ZXMP6A18K

60V P-channel enhancement mode MOSFET

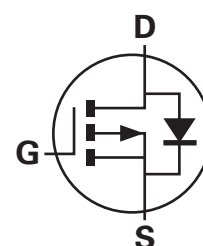
Summary

$V_{(BR)DSS} = -60V$; $R_{DS(on)} = 0.055$; $I_D = -10.4A$



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

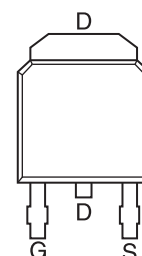
- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- DPAK package

Applications

- Motor drive
- Disconnect switches

Ordering information

Device	Reel size (inches)	Tape width	Quantity per reel
ZXMP6A18KTC	13	16mm	2500 units



Pinout - Top view

Device marking

ZXMP
6A18

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DSS}	-60	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	-10.4 -8.3 -6.8	A A A
Pulsed drain current ^(c)	I_{DM}	-37.5	A
Continuous source current (body diode) ^(b)	I_S	-11.5	A
Pulsed source current (body diode) ^(c)	I_{SM}	-37.5	A
Power dissipation at $T_A = 25^{\circ}C$ ^(a) Linear derating factor	P_D	4.3 34.4	W mW/ $^{\circ}C$
Power dissipation at $T_A = 25^{\circ}C$ ^(b) Linear derating factor	P_D	10.1 80.8	W mW/ $^{\circ}C$
Power dissipation at $T_A = 25^{\circ}C$ ^(d) Linear derating factor	P_D	2.15 17.2	W mW/ $^{\circ}C$
Operating and storage temperature range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

Thermal resistance

Parameter	Symbol	Value	Unit
Junction to ambient ^(a)	$R_{\theta JA}$	29	$^{\circ}C/W$
Junction to ambient ^(b)	$R_{\theta JA}$	12.3	$^{\circ}C/W$
Junction to ambient ^(d)	$R_{\theta JA}$	58	$^{\circ}C/W$

NOTES:

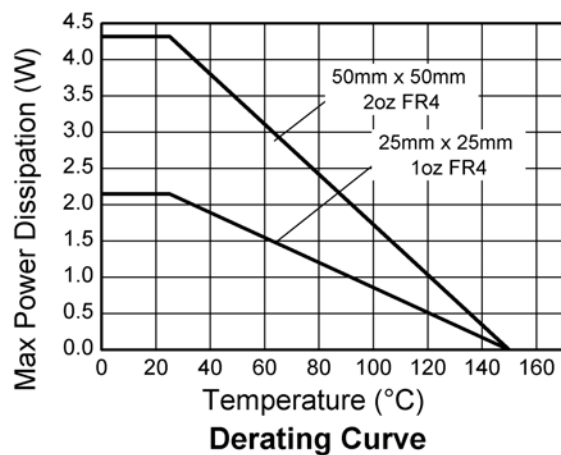
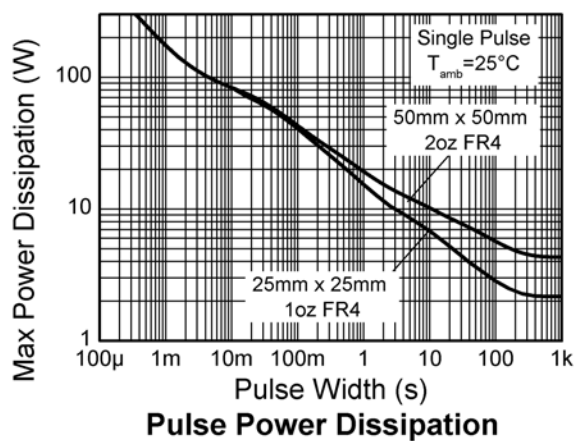
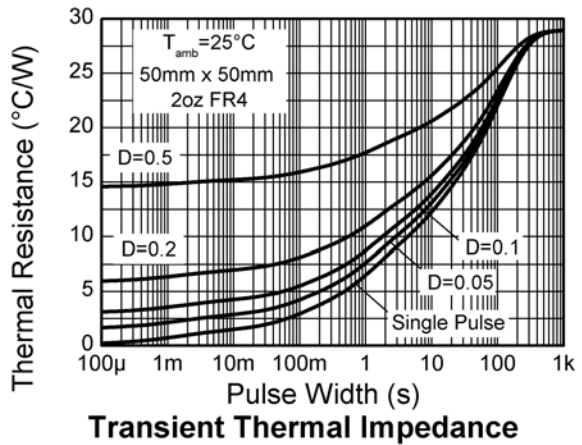
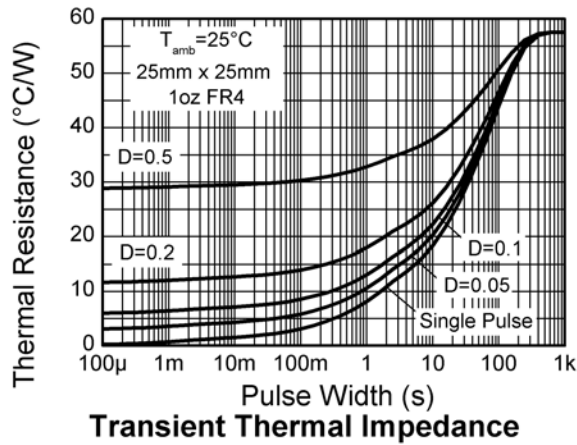
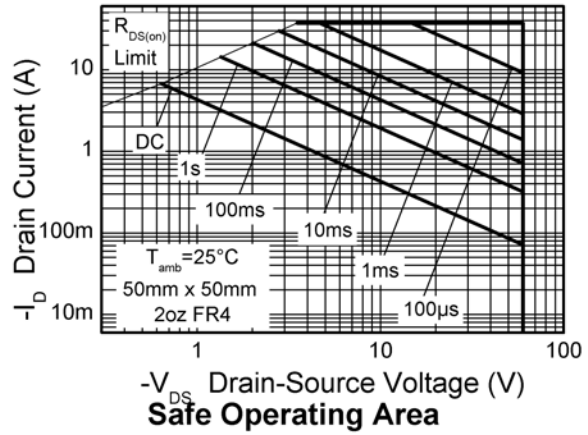
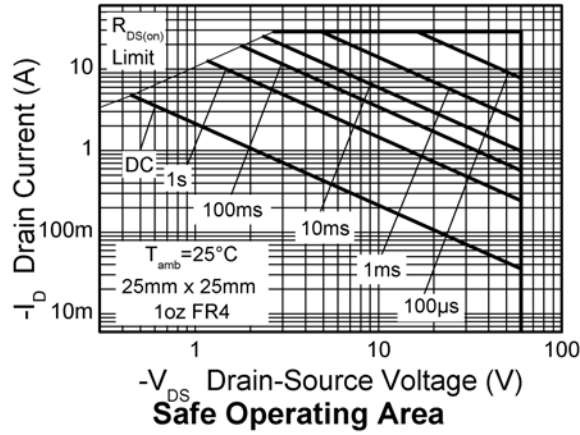
(a) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

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

(c) Repetitive rating 50mm x 50mm x 1.6mm FR4 PCB, $D=0.02$ pulse width=300 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



ZXMP6A18K

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}	-60			V	I _D =-250μA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}			-1.0	μA	V _{DS} =-60V, 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)}			0.055 0.080	Ω	V _{GS} =-10V, I _D =-3.5A V _{GS} =-4.5V, I _D =-2.9A
Forward transconductance ^{(*)(‡)}	g _{fs}		8.7		S	V _{DS} =-15V, I _D =-3.5A
Dynamic ^(‡)						
Input capacitance	C _{iss}		1580		pF	V _{DS} =-30 V, V _{GS} =0V, f=1MHz
Output capacitance	C _{oss}		160		pF	
Reverse transfer capacitance	C _{rss}		140		pF	
Switching ^{(†) (‡)}						
Turn-on delay time	t _{d(on)}		4.6		ns	V _{DD} =-30V, I _D =-1A R _G =6.0W,V _{GS} =-10V
Rise time	t _r		5.8		ns	
Turn-off delay time	t _{d(off)}		55		ns	
Fall time	t _f		23		ns	
Gate charge	Q _g		23		nC	V _{DS} =-30V,V _{GS} =-5V, I _D =-3.5A
Total gate charge	Q _g		44		nC	V _{DS} =-30V,V _{GS} =-10V, I _D =-3.5A
Gate-source charge	Q _{gs}		3.9		nC	
Gate-drain charge	Q _{gd}		9.8		nC	
Source-drain diode						
Diode forward voltage ^(*)	V _{SD}		-0.85	-0.95	V	T _J =25°C, I _S =-4.2A, V _{GS} =0V
Reverse recovery time ^(‡)	t _{rr}		37		ns	T _J =25°C, I _F =-2.1A, di/dt= 100A/μs
Reverse recovery charge ^(‡)	Q _{rr}		56		nC	

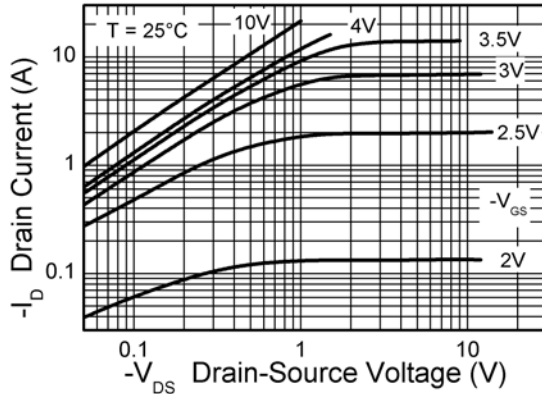
NOTES:

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

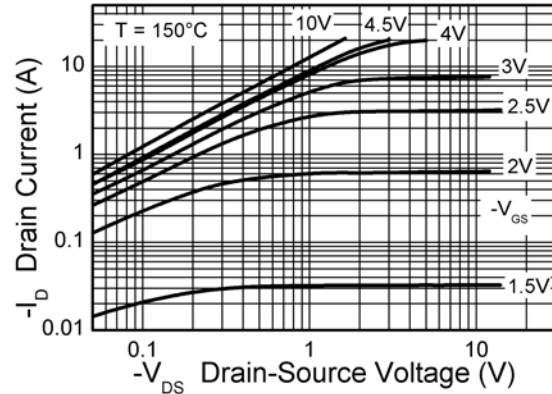
(†) Switching characteristics are independent of operating junction temperature.

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

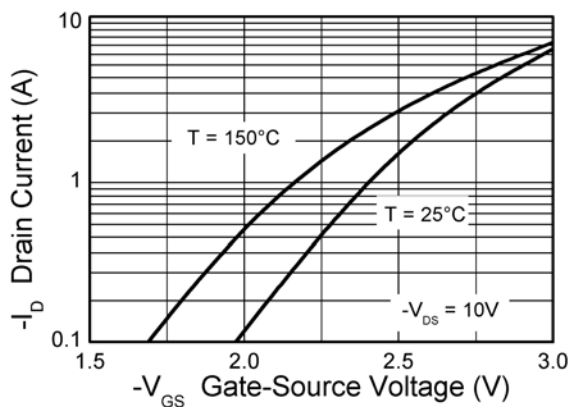
Typical characteristics



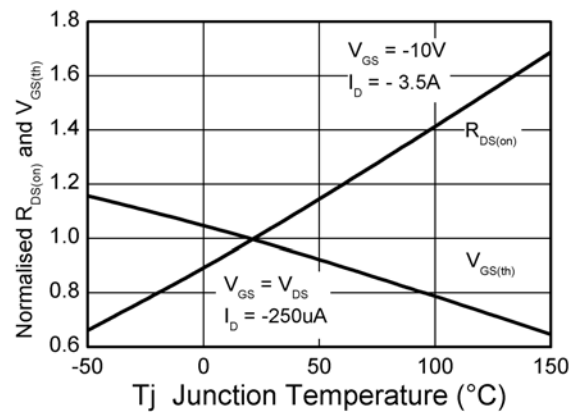
Output Characteristics



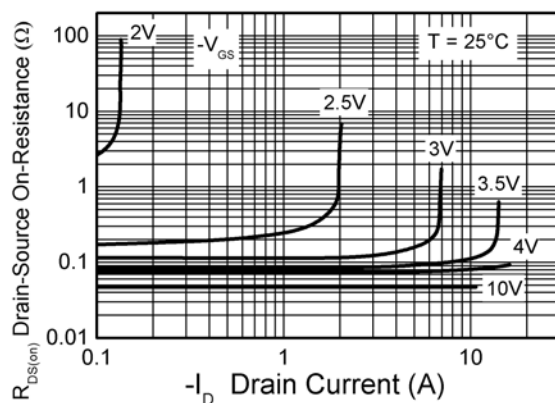
Output Characteristics



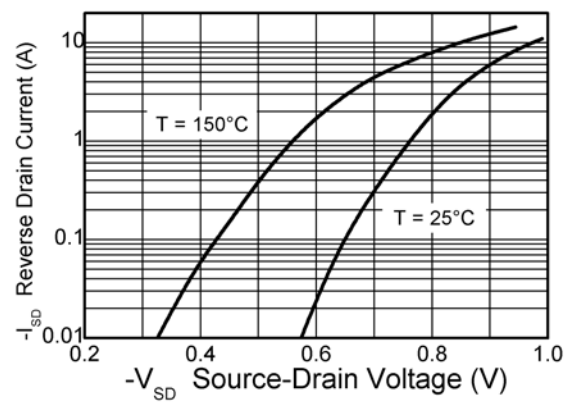
Typical Transfer Characteristics



Normalised Curves v Temperature



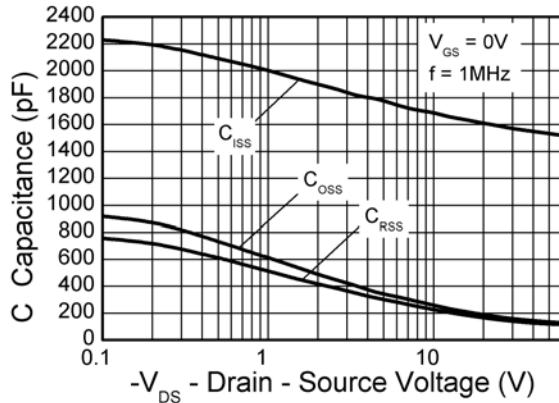
On-Resistance v Drain Current



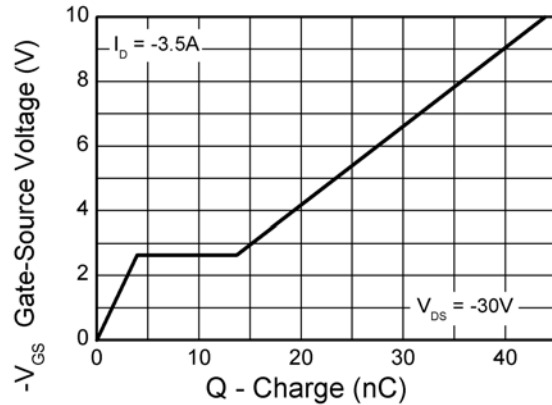
Source-Drain Diode Forward Voltage

ZXMP6A18K

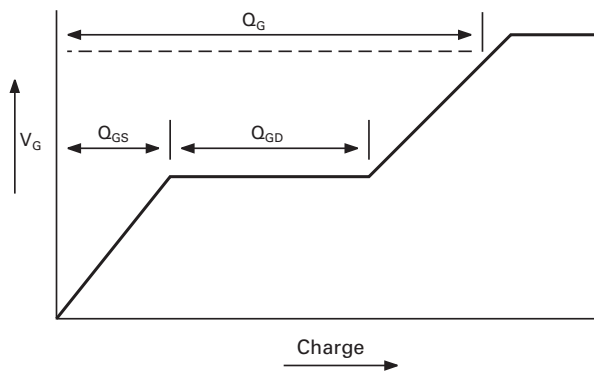
Typical Characteristics



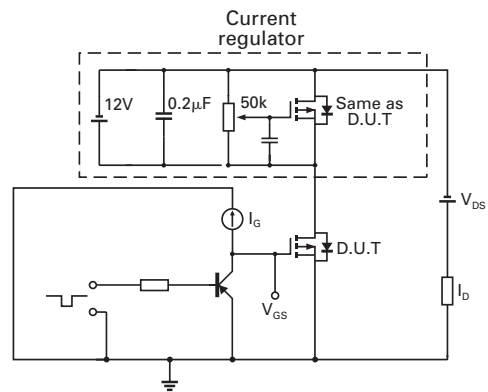
Capacitance v Drain-Source Voltage



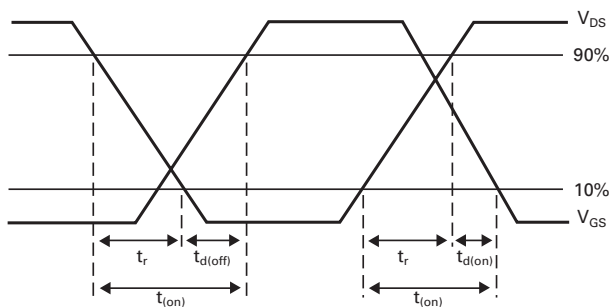
Gate-Source Voltage v Gate Charge



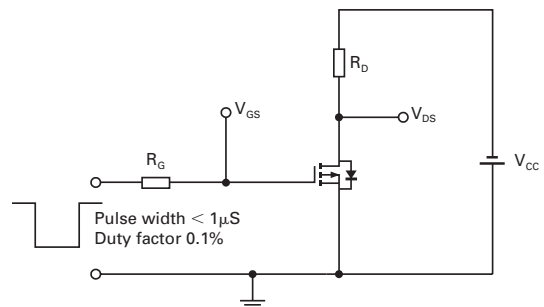
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



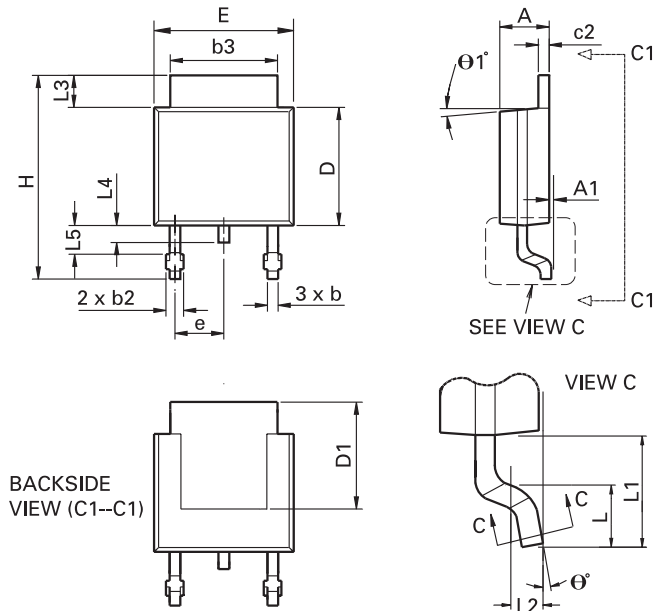
Switching time test circuit

ZXMP6A18K

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ZXMP6A18K

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	-	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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