



P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(on) max}	I _D T _A = +25°C (Note 6)	
-100V	150mΩ@ V _{GS} = -10V	-5.9A	
-100 V	190mΩ@ V _{GS} =-6V	-5.1A	

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.

Applications

- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

Features and Benefits

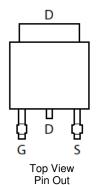
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- DPAK Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

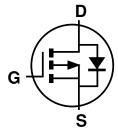
Mechanical Data

- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See diagram below
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 ©3
- Weight: 0.315 grams (Approximate)



Top View





Equivalent circuit

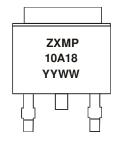
Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
ZXMP10A18KTC	Standard	TO252	2,500/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead_free.html com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



ZXMP10A18 = Product Type Marking Code YYWW = Date Code Marking YY = Year (ex: 10 = 2010) WW = Week (01 - 53)



Maximum Ratings (@ $T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	-100	V
Gate-Source Voltage		V _{GSS}	±20	V
	$T_A = +25^{\circ}C \text{ (Note 6)}$		-5.9	
Continuous Drain Current	$T_A = +70^{\circ}C \text{ (Note 6)}$	I _D	-4.7	Α
	$T_A = +25^{\circ}C \text{ (Note 5)}$		-3.8	
Pulsed Drain Current (Note 7)		I _{DM}	-21.1	Α
Continuous Source Current (Body Diode) (Note 6)		I _S	-10	Α
Pulsed Source Current (Body Diode) (Note 7)		I _{SM}	-21.1	Α

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

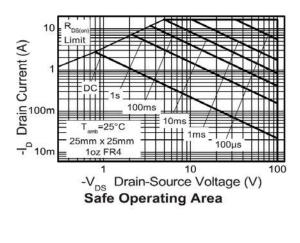
Characteristic		Symbol	Value	Units	
	T _A = +25°C (Note 5)		4.3	W	
			34.4	mW/°C	
Total Power Dissipation (Note 5) Linear Derating Factor	T _A = +25°C (Note 6)	n	10.2	W	
		P_{D}	81.3	mW/°C	
	T _A = +25°C (Note 8)		2.17	W	
			17.4	mW/°C	
	(Note 5)		29		
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	12.3	°C/W	
	(Note 8)	V-	57.6		
Operating and Storage Temperature Range		$T_{J_i}T_{STG}$	-55 to +150	°C	

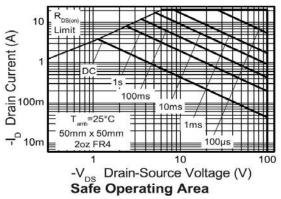
5. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

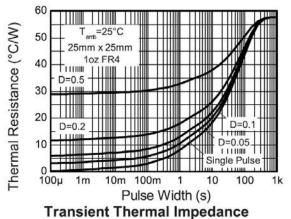
- 6. For a device surface mounted on FR4 PCB measured at t ≤10 sec.
- 7. Repetitive rating on 50mm x 50mm x 1.6mm FR4 PCB, D=0.02, pulse width=300µs pulse width limited by maximum junction temperature.

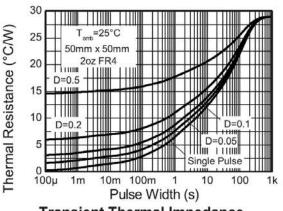
 8. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

Thermal characteristics



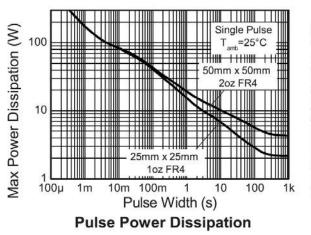


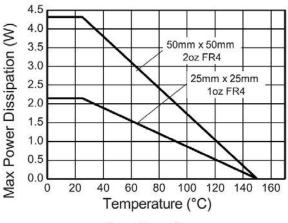




Transient Thermal Impedance







Derating Curve

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	-100	_	_	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	I _{DSS}	_	_	-1	μΑ	$V_{DS} = -100V, V_{GS} = 0V$
Gate-Source Leakage	IGSS	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	-2		-4	V	$V_{DS} = V_{GS}$, $I_D = -250\mu A$
Static Drain-Source On-Resistance (Note 9)	R _{DS (ON)}	_		150 190	mΩ	$V_{GS} = -10V$, $I_D = -2.8A$ $V_{GS} = -6V$, $I_D = -2.4A$
Forward Transconductance (Notes 9 & 11)		_	6	_	S	V _{DS} = -15V, I _D = -2.8A
DYNAMIC CHARACTERISTICS (Note 11)	0.0	L		I	L	, == , =
Input Capacitance	C _{iss}	_	1055	_	pF	
Output Capacitance	Coss	_	90	_	pF	$V_{DS} = -50V$, $V_{GS} = 0V$, $f = 1MHz$
Reverse Transfer Capacitance	C _{rss}	_	76	_	pF	
SWITCHING CHARACTERISTICS (Notes 10 & 11						
Turn-On Delay Time	t _{d(on)}	_	4.9	_		$\begin{split} V_{DS} = \text{-}50\text{V}, V_{GS} = \text{-}10\text{V}, \\ I_D = \text{-}1\text{A}, R_G = 6\Omega \end{split}$
Rise Time	t _r	_	6.8	_		
Turn-On Delay Time	t _{d(off)}	_	33.9	_	ns	
Rise Time	t _f	_	17.9	_		
Total Gate Charge	Qg	_	26.9	_		$V_{DS} = -50V$, $V_{GS} = -10V$, $I_{D} = -2.8A$
Gate-Source Charge	Q _{qs}	_	3.9	_	nC	
Gate-Drain Charge	Q _{gd}	_	10.2	_		
SOURCE-DRAIN DIODE CHARACTERISTICS		•			•	
Diode Forward Voltage (Note 9)	V_{SD}	_	-0.85	-0.95	V	$T_J = +25^{\circ}C$, $V_{GS} = 0V$, $I_S = -3.5A$
Reverse Recovery Time (Note 11)	t _{rr}	_	49	_	ns	$T_J = +25^{\circ}C$, $I_S = -2.8A$,
Reverse Recovery Charge (Note 11)	Q _{rr}		107	_	nC	di/dt=100A/μs,

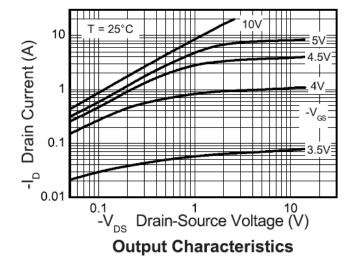
Notes: 9. Measured under pulsed conditions. Pulse width \leq 300 μ s; duty cycle \leq 2%.

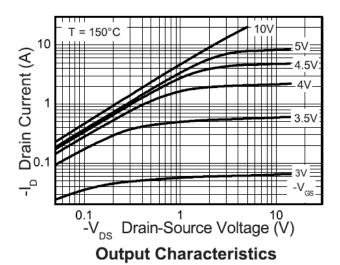
^{10.} Switching characteristics are independent of operating junction temperature.

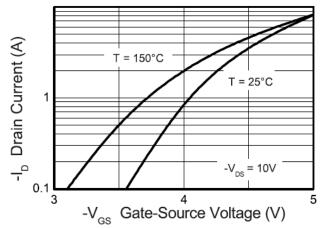
^{11.} For design aid only, not subject to production testing.

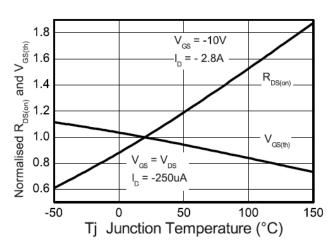


Typical characteristics



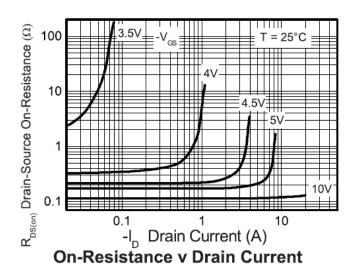


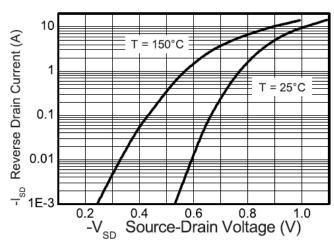




Typical Transfer Characteristics

Normalised Curves v Temperature

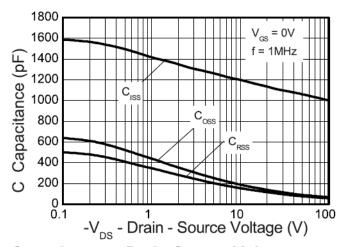




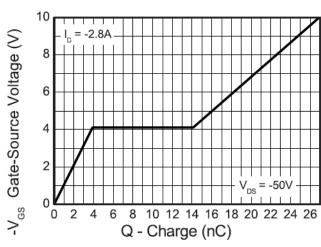
Source-Drain Diode Forward Voltage



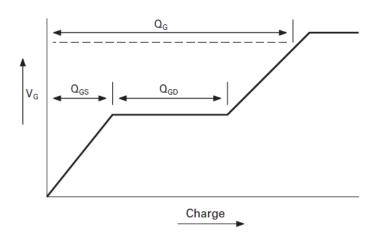
Typical characteristics



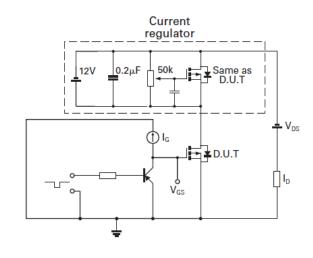
Capacitance v Drain-Source Voltage



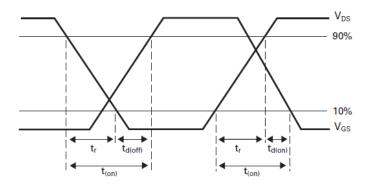
Gate-Source Voltage v Gate Charge



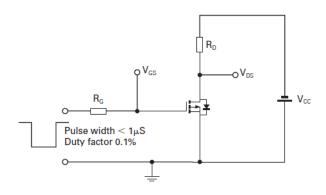
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

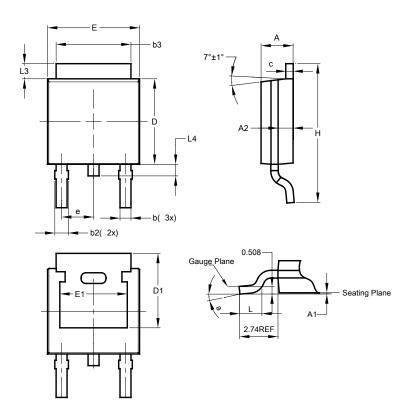


Switching time test circuit



Package Outline Dimensions

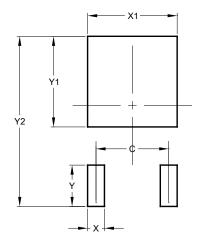
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



TO252 (DPAK)				
Dim	Min	Max	Тур	
Α	2.19	2.39	2.29	
A 1	0.00	0.13	0.08	
A2	0.97	1.17	1.07	
q	0.64	0.88	0.783	
b2	0.76	1.14	0.95	
b3	5.21	5.46	5.33	
С	0.45	0.58	0.531	
D	6.00	6.20	6.10	
D1	5.21	-	-	
е	-	-	2.286	
Е	6.45	6.70	6.58	
E1	4.32	-	-	
H	9.40	10.41	9.91	
L	1.40	1.78	1.59	
L3	0.88	1.27	1.08	
L4	0.64	1.02	0.83	
а	0°	10°	-	
All Dimensions in mm				

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)			
С	4.572			
Х	1.060			
X1	5.632			
Υ	2.600			
Y1	5.700			
Y2	10.700			



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