



40V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(on) max}	Ι _D T _A = +25°C
-40V	60mΩ @ V _{GS} = -10V	-6.4A
-40 V	$100m\Omega @ V_{GS} = -4.5V$	-5.0A

Description

This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

- DC-DC Converters
- Power Management Functions
- Backlighting

Features and Benefits

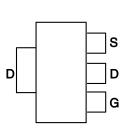
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

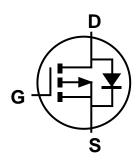
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (63)
- Weight: 0.112 grams (Approximate)



Top View



Pin Out - Top



Equivalent Circuit

Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP4A16GTA	ZXMP4A16	7	12	1,000
ZXMP4A16GTC	ZXMP4A16	13	12	4,000

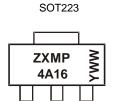
Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.

 See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.

3. Haloger- 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



ZXMP4A16 = Product Type Marking Code YWW = Date Code Marking Y or \overline{Y} = Last Digit of Year (ex: 5= 2015) WW or $\overline{W}W$ = Week Code (01~53)



Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic Drain-Source Voltage Gate-Source Voltage			Symbol	Value	Units
			V _{DSS}	-40	V
			V _{GSS}	±20	V
Continuous Drain Current, V_{GS} = -10V	Steady State	$T_A = +25^{\circ}C$ (Note 6) $T_A = +70^{\circ}C$ (Note 6) $T_A = +25^{\circ}C$ (Note 5)	I _D	-6.4 -5.1 -4.6	А
Maximum Body Diode Forward Current (Note 6)			Is	-5.2	A
Pulsed Drain Current (Note 7)			I _{DM}	-21	A
Pulsed Source Current (Note 7)			I _{SM}	-21	A

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

Characteristic	Symbol	Value	Units	
Total Power Dissipation Linear Derating Factor	T _A = +25°C (Note 5)	PD	2.0 16	W mW/°C
Total Power Dissipation Linear Derating Factor	T _A = +25°C (Note 6)	PD	3.9 31	W mW/°C
Thermal Resistance, Junction to Ambient	Steady state (Note 5)	Р	62.5	°C/W
	Steady state (Note 6)	R _{0JA}	32	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

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

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 9)							
Drain-Source Breakdown Voltage	BV _{DSS}	-40	—		V	$V_{GS} = 0V, I_D = -250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	—	-1.0	μA	$V_{DS} = -40V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}		_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 9)	•		•	•	•		
Gate Threshold Voltage	V _{GS(th)}	-1.0	—	_	V	$V_{DS} = V_{GS}$, $I_D = -250 \mu A$	
Statia Drain Source On Begistenes (Note 9)	Deserve	_	_	60	mΩ	V _{GS} = -10V, I _D = -3.8A	
Static Drain-Source On-Resistance (Note 8)	R _{DS(ON)}	_	_	100	1117	$V_{GS} = -4.5V, I_D = -2.9A$	
Diode Forward Voltage (Note 8)	V _{SD}		-0.85	-1.2	V	$V_{GS} = 0V, I_{S} = -3.4A$	
Forward Transconductance (Notes 8 & 10)	g fs		8.85		S	V _{DS} = -15V, I _D = -3.8A	
DYNAMIC CHARACTERISTICS (Note 10)			•		•		
Input Capacitance	Ciss		1,007			$V_{DS} = -20V, V_{GS} = 0V$ f = 1.0MHz	
Output Capacitance	C _{oss}	_	130		pF		
Reverse Transfer Capacitance	C _{rss}	_	85				
Total Gate Charge (V _{GS} = -5.0V)	Qg		13.6			$V_{DS} = -20V, I_D = -3.8A,$	
Total Gate Charge (V _{GS} = -10V)	Qg		26.1		-0		
Gate-Source Charge	Qgs		2.8		nC		
Gate-Drain Charge	Q _{gd}		4.8				
Turn-On Delay Time	t _{D(on)}		2.33			$V_{GS} = -10V, V_{DD} = -20V, R_G = 6.0\Omega,$ $I_D = -1.0A$	
Turn-On Rise Time	tr		8.84	_	nS		
Turn-Off Delay Time	t _{D(off)}		29.18	_			
Turn-Off Fall Time	tf		12.54	_			
Body Diode Reverse Recovery Time	t _{rr}		27.2		nS		
Body Diode Reverse Recovery Charge	Q _{rr}		25.4		nC	-I _F = -3A, dl/dt = 100A/μs	

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

 6. For a device surface mounted on FR4 PCB measured at t ≤10 secs.

 7. Repetitive rating 25mm x 25mm FR4 PCB, D = 0.05, pulse width limited by maximum junction temperature.

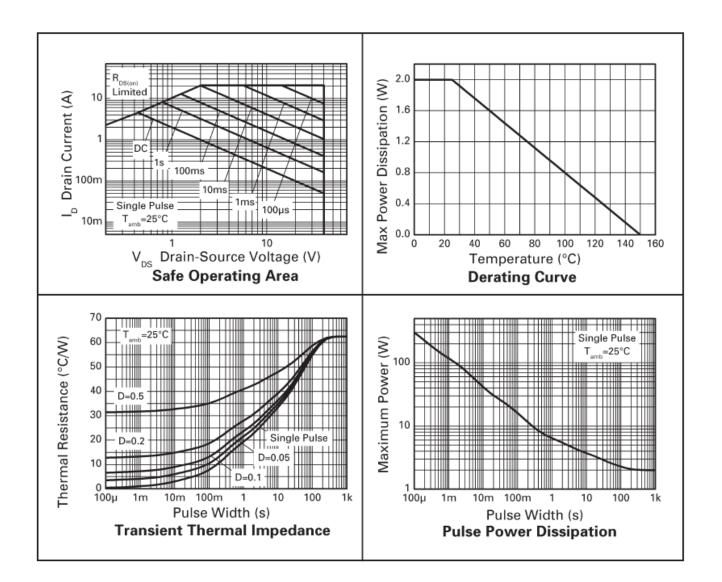
8. Measured under pulsed conditions. Width \leq 300µs. Duty cycle \leq 2%.

9. Short duration pulse test used to minimize self-heating effect.

10. Guaranteed by design. Not subject to product testing.

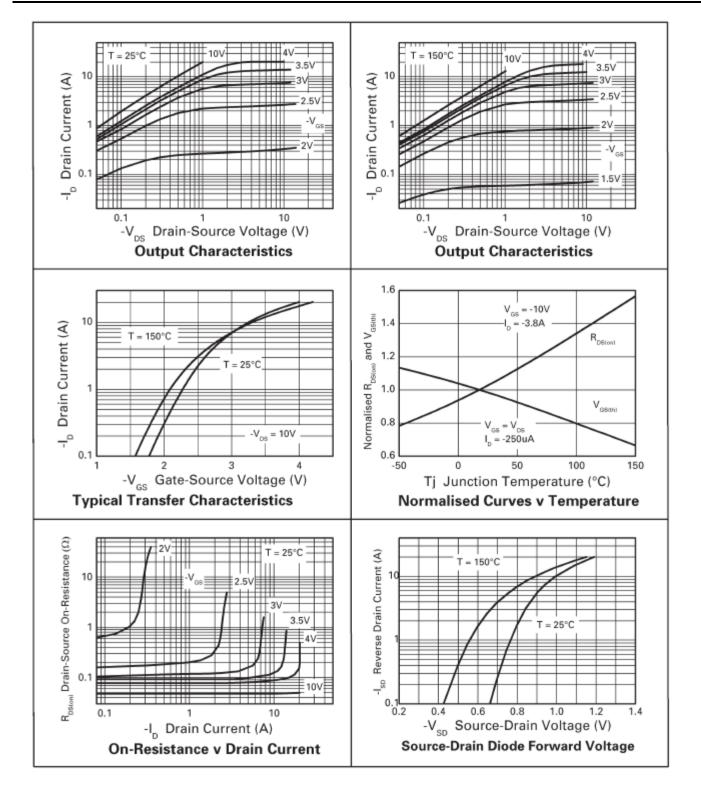


Typical Characteristics



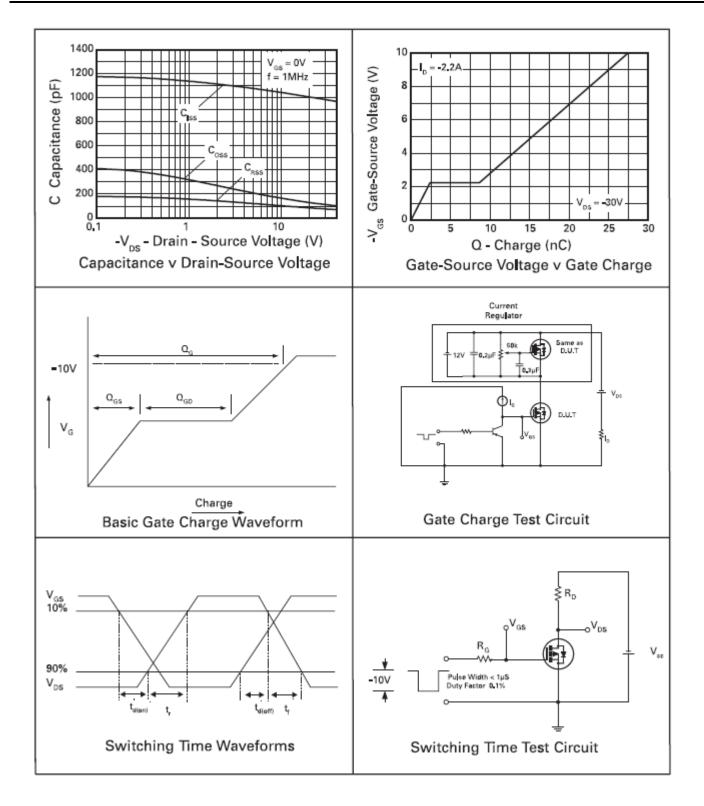


Typical Characteristics (continued)





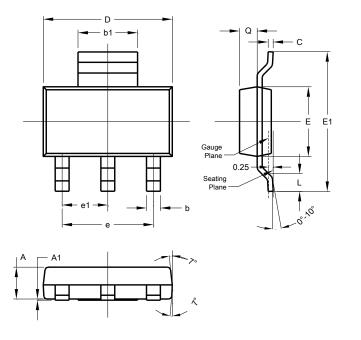
Typical Characteristics (continued)





Package Outline Dimensions

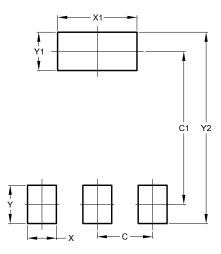
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT223					
Dim	Min	Max	Тур		
Α	1.55	1.65	1.60		
A1	0.010	0.15	0.05		
b	0.60	0.80	0.70		
b1	2.90	3.10	3.00		
С	0.20	0.30	0.25		
D	6.45	6.55	6.50		
E	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	-	-	4.60		
e1	-	-	2.30		
L	0.85	1.05	0.95		
Q	0.84	0.94	0.89		
All I	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	2.30
C1	6.40
Х	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00



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