



40V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

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

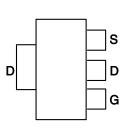
- Low Input Capacitance
- Low On-Resistance
- · Fast Switching Speed
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

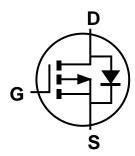
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (e3)
- Weight: 0.112 grams (Approximate)







Pin Out - Top



Equivalent Circuit

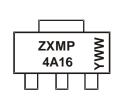
Ordering Information (Note 4)

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.
- 2. 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. 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



SOT223

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

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

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)	P _D	2.0 16	W mW/°C
Total Power Dissipation Linear Derating Factor	T _A = +25°C (Note 6)	P _D	3.9 31	W mW/°C
Thermal Resistance, Junction to Ambient	Steady state (Note 5)	D	62.5	°C/W
Thermal Resistance, Junction to Ambient	Steady state (Note 6)	$R_{\theta JA}$	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	$V_{DS} = V_{GS}$, $I_D = -250\mu A$	
Static Drain-Source On-Resistance (Note 8)	D-s/s/iii			60	mΩ	$V_{GS} = -10V, I_D = -3.8A$	
Static Dialif-Source Off-Resistance (Note 6)	R _{DS(ON)}	_	_	100	11177	$V_{GS} = -4.5V, I_D = -2.9A$	
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	Coss	_	130	_	pF		
Reverse Transfer Capacitance	Crss	_	85	_			
Total Gate Charge (V _{GS} = -5.0V)	Q_g	_	13.6	_		$V_{DS} = -20V, I_{D} = -3.8A,$	
Total Gate Charge (V _{GS} = -10V)	Q_g	_	26.1	_	nC		
Gate-Source Charge	Qgs	_	2.8	_	110		
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	t _r	_	8.84	_	nS		
Turn-Off Delay Time	t _{D(off)}	_	29.18	_	113		
Turn-Off Fall Time	t _f	_	12.54	_			
Body Diode Reverse Recovery Time	t _{rr}	_	27.2	_	nS	I _F = -3A, dI/dt = 100A/µs	
Body Diode Reverse Recovery Charge	Q _{rr}		25.4	_	nC	71F = -3A, αι/αι = 100A/μS	

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. Notes:

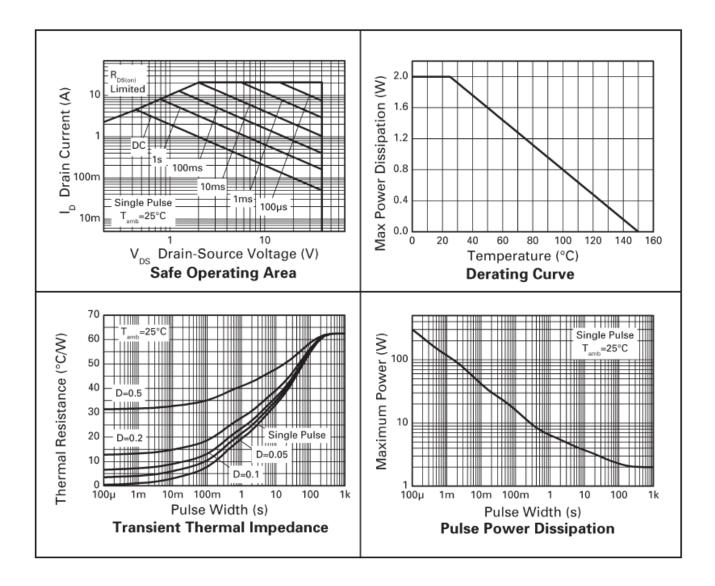
^{8.} Measured under pulsed conditions. Width≤300µs. Duty cycle ≤ 2%.

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

^{10.} Guaranteed by design. Not subject to product testing.

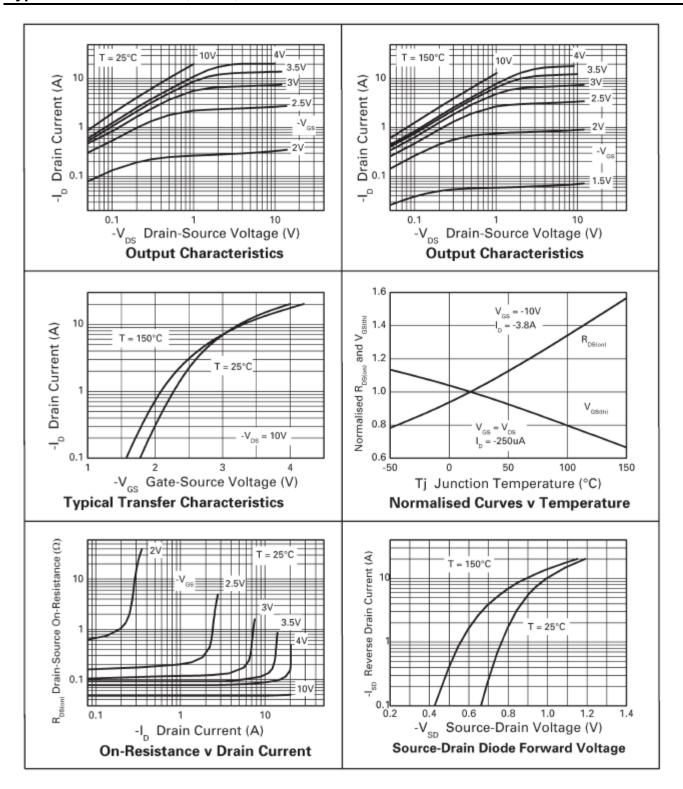


Typical Characteristics



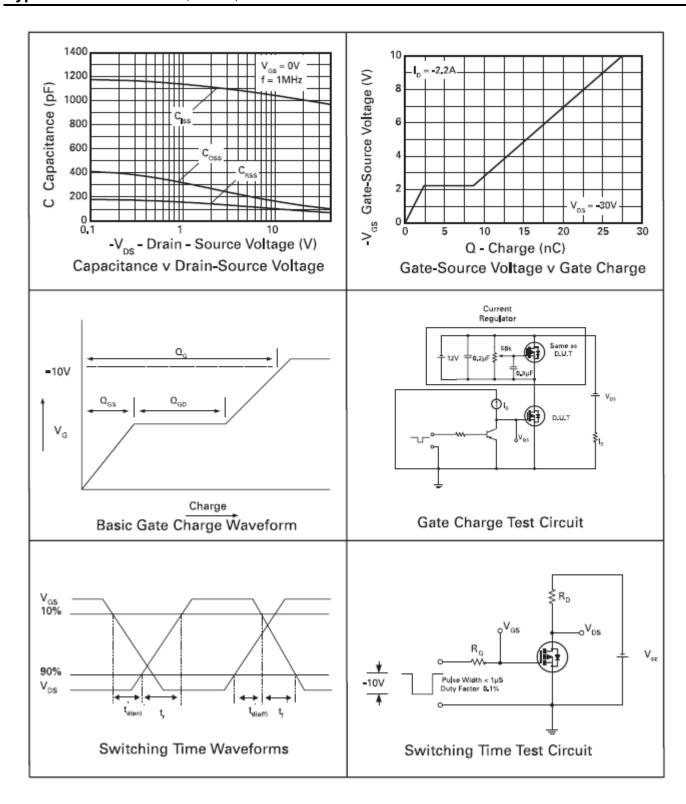


Typical Characteristics (continued)





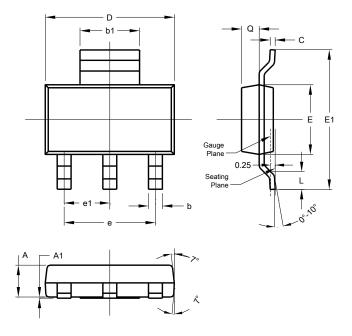
Typical Characteristics (continued)





Package Outline Dimensions

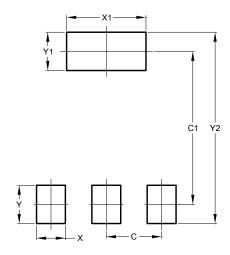
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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		
Е	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 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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