



#### P-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub> max	I <sub>D</sub> max T <sub>A</sub> = +25°C
	39mΩ @ V <sub>GS</sub> = -4.5V	-2.5A
-16V	52mΩ @ V <sub>GS</sub> = -2.5V	-2.1A
	65mΩ @ V <sub>GS</sub> = -1.8V	-1.8A

### **Description and Applications**

This MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Backlighting
- Power Management Functions
- DC-DC Converters

# **Features and Benefits**

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Up To 3kV
- 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
- PPAP Capable (Note 4)

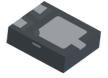
#### Mechanical Data

- Case: X2-DFN2015-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @4
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)

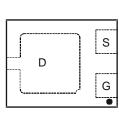




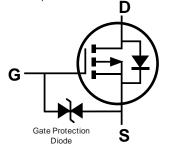
Top View



**Bottom View** 







**Equivalent Circuit** 

#### Ordering Information (Note 5)

-7			
	Part Number	Case	Packaging
	DMG3415UFY4Q-7	X2-DFN2015-3	3,000/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 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product\_compliance\_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

## Marking Information

34P **YM** 

34P = Marking Code YM = Date Code Marking Y = Year (ex: C = 2015)M = Month (ex: 9 = September)

Date Code Key

Year	2009		-	2015	2016	20	17	2018	2019	20	20	2021
Code	W		-	С	D		=	F	G		1	I
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	-16	V
Gate-Source Voltage	$V_{GSS}$	±8	V
Continuous Drain Current (Note 7) V <sub>GS</sub> = -4.5V	ΙD	-2.5 -2.2	А
Pulsed Drain Current (Note 7)	I <sub>DM</sub>	-12	Α

### **Thermal Characteristics**

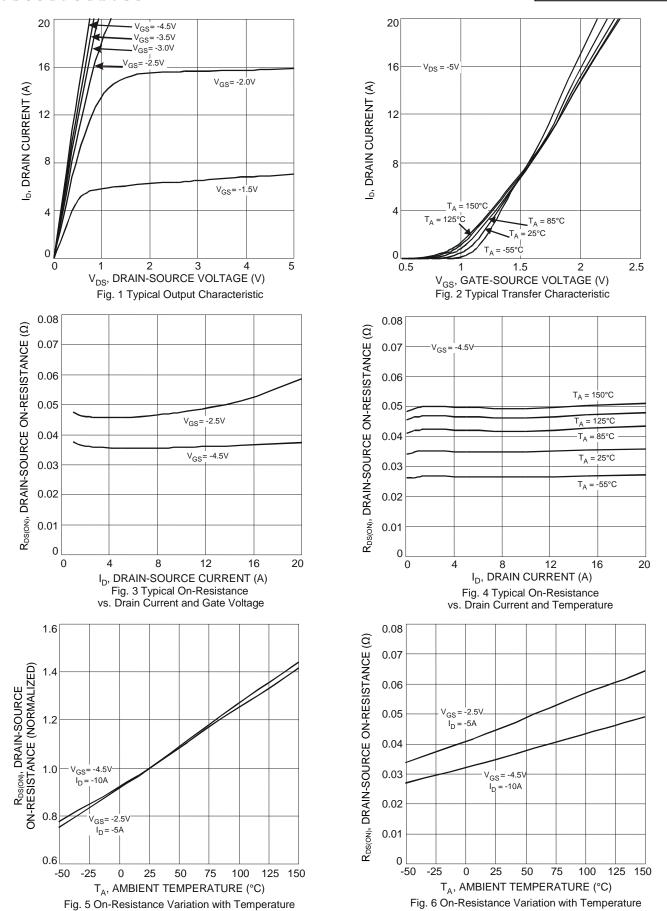
Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)		$P_{D}$	0.65	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{ heta JA}$	197	°C/W
Total Power Dissipation (Note 7)		$P_{D}$	1.35	W
Thermal Resistance, Junction to Ambient (Note 7)  Steady State		$R_{ hetaJA}$	95	°C/W
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	22	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-16	_	_	V	$V_{GS} = 0V, I_{D} = -250\mu A$	
Zero Gate Voltage Drain Current $T_J = +25^{\circ}C$	I <sub>DSS</sub>	1	1	-1.0	μA	$V_{DS} = -16V, V_{GS} = 0V$	
Gate-Source Leakage	I <sub>GSS</sub>			±10	μΑ	$V_{GS} = \pm 8V$ , $V_{DS} = 0V$	
	1688			±500	nA	$V_{GS} = \pm 5V$ , $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.3	-0.55	-1.0	V	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	
			31	39		$V_{GS} = -4.5V, I_D = -4.0A$	
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	_	40	52	mΩ	$V_{GS} = -2.5V, I_D = -3.5A$	
	-(-,		51	65		$V_{GS} = -1.8V, I_D = -2.0A$	
Forward Transfer Admittance	Y <sub>fs</sub>		7.9		S	$V_{DS} = -5V, I_{D} = -2.5A$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance			282		pF	10// 1/	
Output Capacitance			152		pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V -f = 1.0MHz	
Reverse Transfer Capacitance	Crss		38		рF	1 = 1.0WH2	
Gate Resistance	$R_g$		250		Ω	$V_{DS} = 0V$ , $V_{GS} = 0V$ , $f = 1.0MHz$	
Total Gate Charge	$Q_g$		10	_	nC		
Gate-Source Charge			1.5		nC	$V_{GS} = -4.5V, V_{DS} = -10V, I_D = -4A$	
Gate-Drain Charge			2.4		nC		
Turn-On Delay Time			79		ns		
Turn-On Rise Time	t <sub>R</sub>		175		ns	$V_{DS} = -10V, V_{GS} = -4.5V,$	
Turn-Off Delay Time	t <sub>D(OFF)</sub>		885		ns	$R_D = 2.5\Omega$ , $R_G = 3.0\Omega$	
Turn-Off Fall Time	t <sub>F</sub>	_	568	_	ns		

- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 8. Short duration pulse test used to minimize self-heating effect.
- 9. Guaranteed by design. Not subject to product testing.







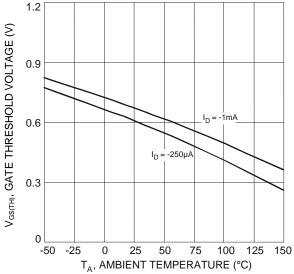
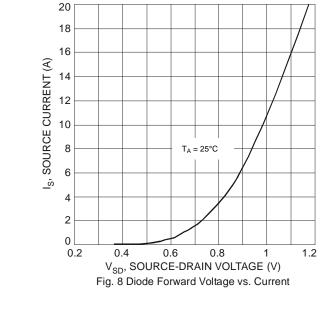


Fig. 7 Gate Threshold Variation vs. Ambient Temperature



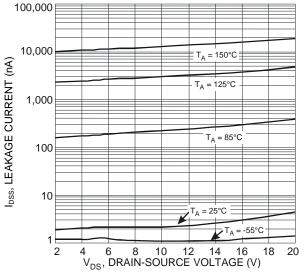


Fig. 9 Typical Leakage Current vs. Drain-Source Voltage

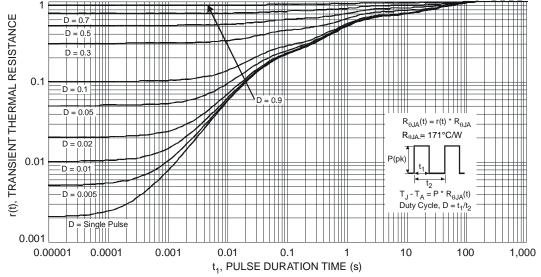


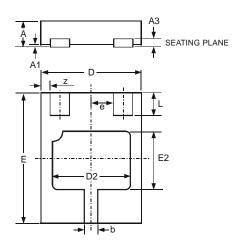
Fig. 10 Transient Thermal Response



### **Package Outline Dimensions**

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

#### X2-DFN2015-3

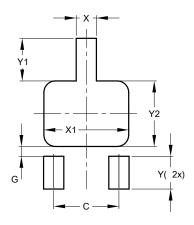


X2-DFN2015-3							
Dim	Min	Max	Тур				
Α	-	0.40	-				
A1	0	0.05	0.02				
A3	1	-	0.13				
b	0.20	0.30	0.25				
D	1.45	1.575	1.5				
D2	1.00	1.20	1.10				
е	-	-	0.50				
E	1.95	2.075	2.00				
E2	0.70	0.90	0.80				
L	0.25	0.35	0.30				
Z	-	-	0.125				
All Dimensions in mm							

## **Suggested Pad Layout**

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

#### X2-DFN2015-3



X2-DFN2015-3					
Dimensions	Value				
Dillielisions	(in mm)				
С	1.000				
G	0.150				
Χ	0.310				
X1	1.300				
Y	0.500				
Y1	0.650				
Y2	1.000				



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