

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max $T_A = +25^\circ\text{C}$
-16V	39m Ω @ $V_{GS} = -4.5\text{V}$	-2.5A
	52m Ω @ $V_{GS} = -2.5\text{V}$	-2.1A
	65m Ω @ $V_{GS} = -1.8\text{V}$	-1.8A

Description and Applications

This 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.

- 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

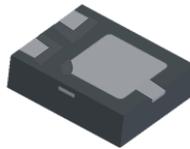
- Case: X2-DFN2015-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @4
- Terminals Connections: See Diagram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



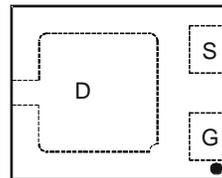
ESD PROTECTED TO 3kV



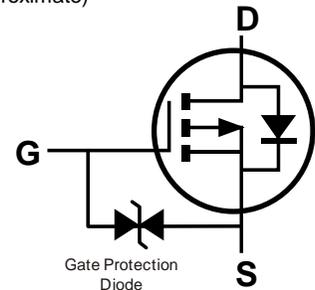
Top View



Bottom View



Internal Schematic
(Top View)



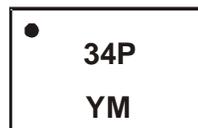
Equivalent Circuit

Ordering Information (Note 5)

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

Date Code Key

Year	2009	~	2015	2016	2017	2018	2019	2020	2021
Code	W	~	C	D	E	F	G	H	I

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°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 _{GS} = -4.5V	I _D	T _A = +25°C	-2.5	A
		T _A = +70°C	-2.2	A
Pulsed Drain Current (Note 7)	I _{DM}	-12	A	

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P _D	0.65	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	197	°C/W
Total Power Dissipation (Note 7)	P _D	1.35	W
Thermal Resistance, Junction to Ambient (Note 7)	R _{θJA}	95	°C/W
Thermal Resistance, Junction to Case (Note 7)	R _{θJC}	22	°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	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-16	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	T _J = +25°C, V _{DS} = -16V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±8V, V _{DS} = 0V
				±500	nA	V _{GS} = ±5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-0.3	-0.55	-1.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	31	39	mΩ	V _{GS} = -4.5V, I _D = -4.0A
			40	52		V _{GS} = -2.5V, I _D = -3.5A
			51	65		V _{GS} = -1.8V, I _D = -2.0A
Forward Transfer Admittance	Y _{fs}	—	7.9	—	S	V _{DS} = -5V, I _D = -2.5A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	282	—	pF	V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	152	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	38	—	pF	
Gate Resistance	R _g	—	250	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge	Q _g	—	10	—	nC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -4A
Gate-Source Charge	Q _{gs}	—	1.5	—	nC	
Gate-Drain Charge	Q _{gd}	—	2.4	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	79	—	ns	V _{DS} = -10V, V _{GS} = -4.5V, R _D = 2.5Ω, R _G = 3.0Ω
Turn-On Rise Time	t _R	—	175	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	885	—	ns	
Turn-Off Fall Time	t _F	—	568	—	ns	

- Notes:
6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to product testing.

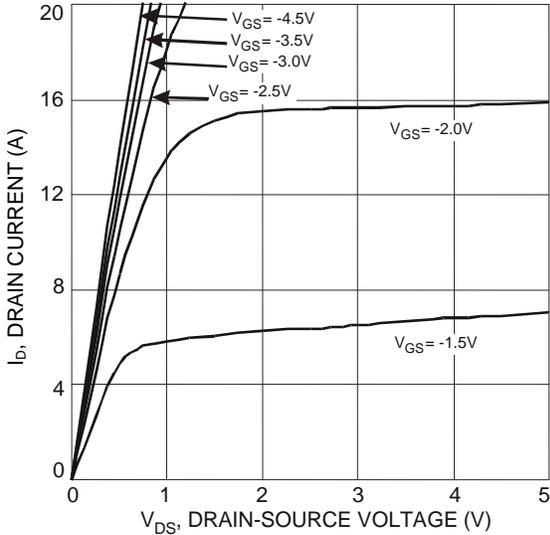


Fig. 1 Typical Output Characteristic

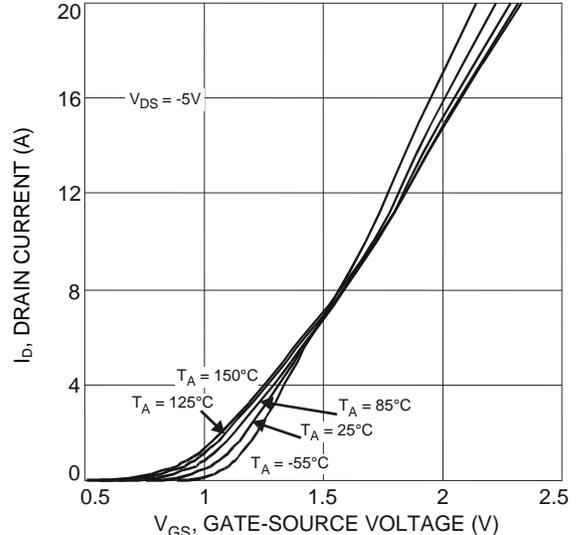


Fig. 2 Typical Transfer Characteristic

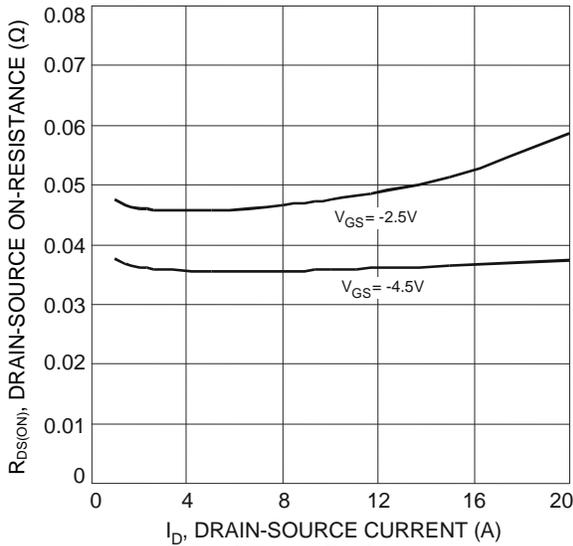


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

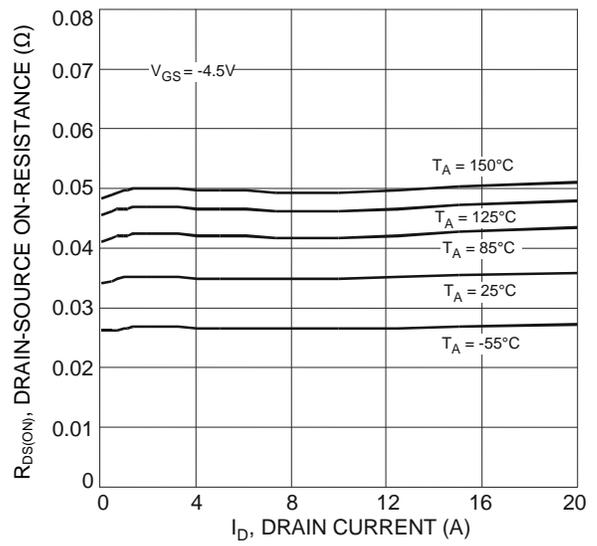


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

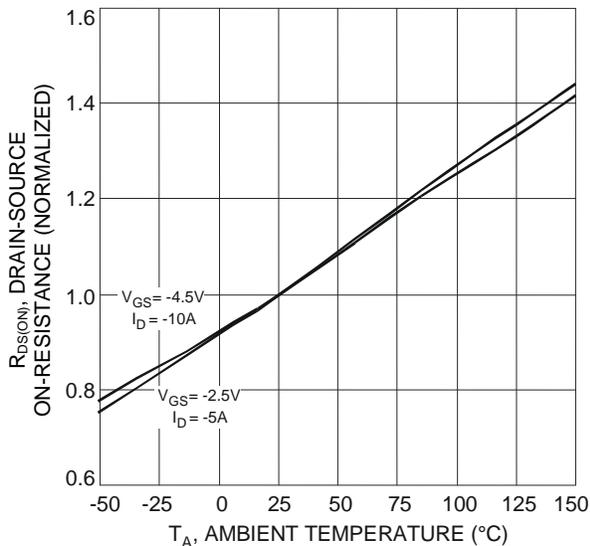


Fig. 5 On-Resistance Variation with Temperature

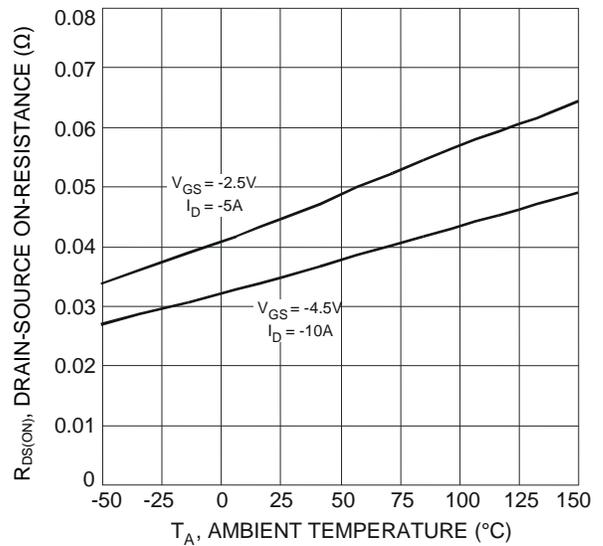


Fig. 6 On-Resistance Variation with Temperature

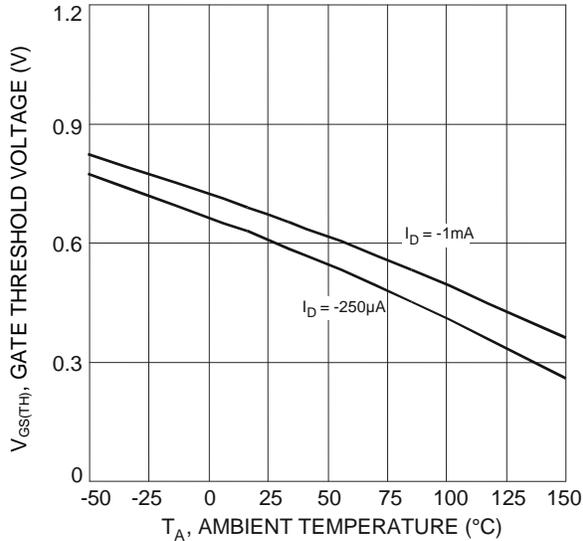


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

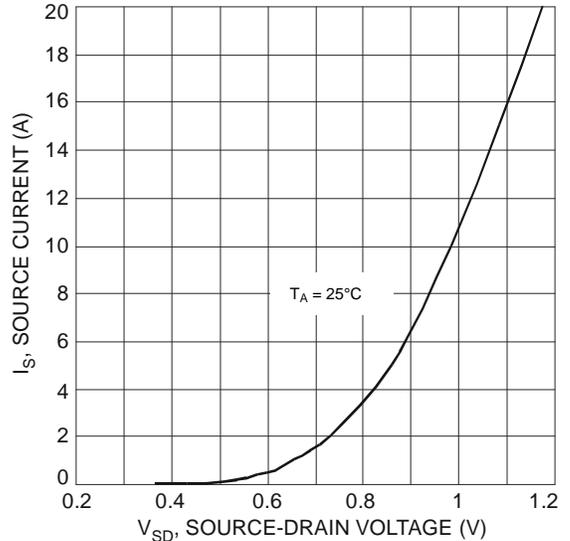


Fig. 8 Diode Forward Voltage vs. Current

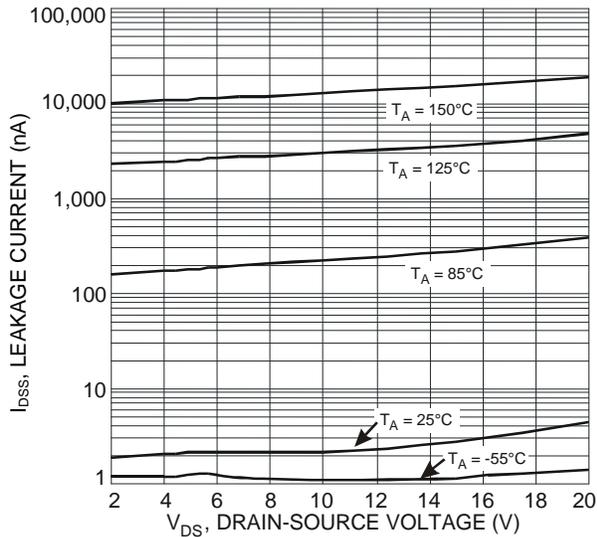


Fig. 9 Typical Leakage Current vs. Drain-Source Voltage

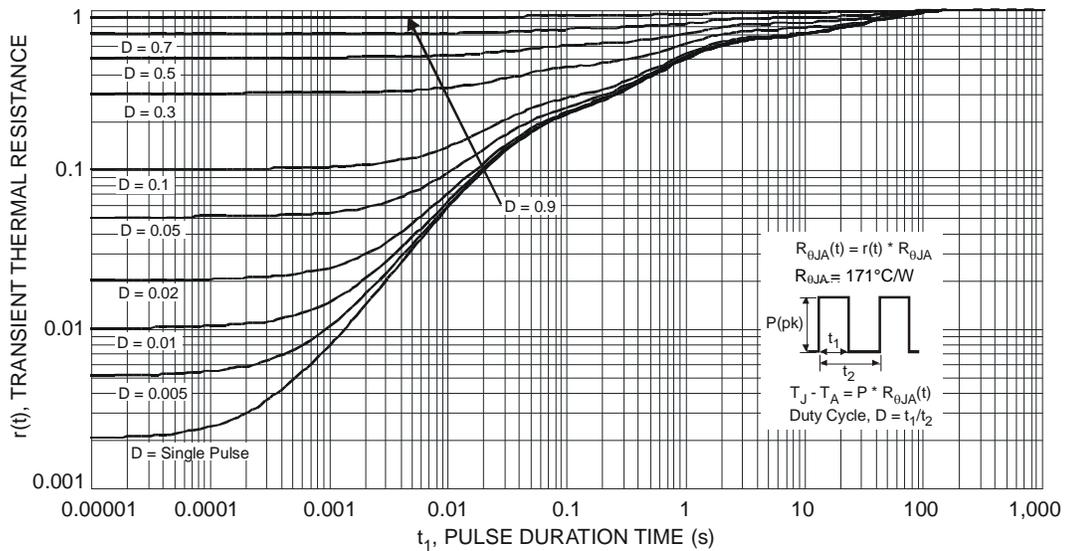
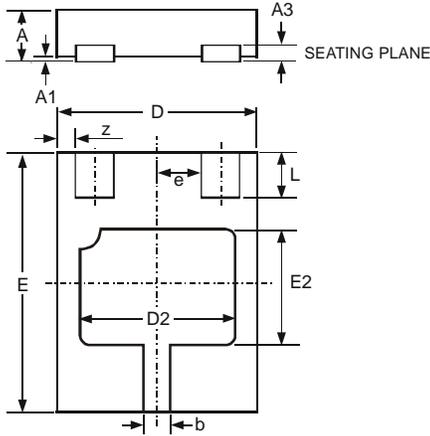


Fig. 10 Transient Thermal Response

Package Outline Dimensions

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

X2-DFN2015-3

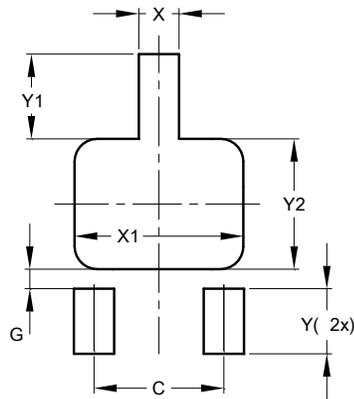


X2-DFN2015-3			
Dim	Min	Max	Typ
A	-	0.40	-
A1	0	0.05	0.02
A3	-	-	0.13
b	0.20	0.30	0.25
D	1.45	1.575	1.5
D2	1.00	1.20	1.10
e	-	-	0.50
E	1.95	2.075	2.00
E2	0.70	0.90	0.80
L	0.25	0.35	0.30
z	-	-	0.125
All Dimensions in mm			

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 (in mm)
C	1.000
G	0.150
X	0.310
X1	1.300
Y	0.500
Y1	0.650
Y2	1.000

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