



N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

V _{(BR)DSS}	R _{DS(ON)}	I _D T _A = +25°C	
	45mΩ @ V _{GS} = 4.5V		
12V	64mΩ @ V _{GS} = 2.5V	3.2A	
	85mΩ @ V _{GS} = 1.8V	U.ZA	
	100mΩ @ V _{GS} = 1.5V		

Description and Applications

This new generation MOSFET has been 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.

- **Power Management Functions**
- Backlighting
- Load Switch

Case: X2-DFN1010-3

Mechanical Data

Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0

Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2) Halogen and Antimony Free. "Green" Device (Note 3)

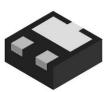
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram

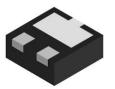
Features and Benefits

Low On-Resistance Low Input/Output Leakage Fast Switching Speed **ESD Protected Gate**

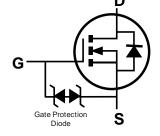
- Terminals: Finish NiPdAu Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0015 Grams (Approximate)

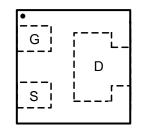






X2-DFN1010-3





Bottom View

Equivalent Circuit

Pin-out Top View

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN1045UFR4-7	X2-DFN1010-3	3000/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 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.

Marking Information



10 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: B = 2014)M = Month (ex: 9 = September)

Date Code Key

Year	201	4	2015		2016	20	17	2018		2019	2	020	
Code	В		С		D		Ξ	F		G		Н	
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°C, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	12	V
Gate-Source Voltage	V_{GSS}	±8	V
Continuous Drain Current (Note 6) V _{GS} = 4.5V	I _D	3.2 2.5	А
Pulsed Drain Current (10μs pulse, Duty cycle = 1%)	I _{DM}	15	А

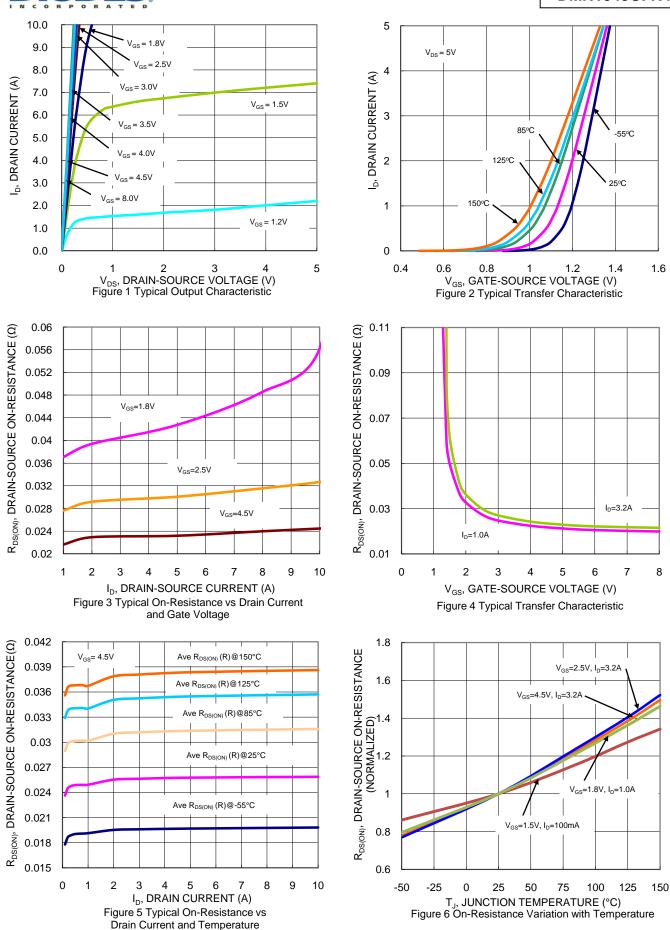
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_{D}	0.5	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{0JA}	251	°C/W
Total Power Dissipation (Note 6)	P_{D}	1.26	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 6)	$R_{\theta JA}$	99	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Tym	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)	Syllibol	IVIIII	Тур	IVIAX	Unit	rest Condition
, ,	D) (40				N/ 01/ 1 050 A
Drain-Source Breakdown Voltage	BV _{DSS}	12	_	_	V	$V_{GS} = 0V, I_D = 250 \mu A$
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μΑ	$V_{DS} = 12V$, $V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	_	_	±10	μΑ	$V_{GS} = \pm 8V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	0.4		1.0	V	$V_{DS} = V_{GS}, I_D = 250 \mu A$
			25	45		$V_{GS} = 4.5V, I_D = 3.2A$
Static Drain-Source On-Resistance	Б		32	64	mΩ	$V_{GS} = 2.5V, I_D = 3.2A$
Static Drain-Source On-Resistance	R _{DS(ON)}	_	40	85	11177	$V_{GS} = 1.8V, I_D = 1A$
			50	100		$V_{GS} = 1.5V, I_D = 0.1A$
Diode Forward Voltage	V_{SD}		_	1.2	V	V _{GS} = 0V, I _S = 1.0A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}		375		pF	
Output Capacitance	Coss		57		pF	$V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz$
Reverse Transfer Capacitance	C _{rss}		51	_	pF	
Total Gate Charge	Q_{g}		4.8		nC	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Gate-Source Charge	Q _{gs}		0.6		nC	$V_{GS} = 4.5V, V_{DS} = 10V$ $I_{D} = 3.2A$
Gate-Drain Charge	Q_{gd}		1.2		nC	ID = 3.2A
Turn-On Delay Time	t _{D(on)}	_	7	_	ns	
Turn-On Rise Time	t _r	_	25		ns	$V_{DD} = 10V, V_{GEN} = 4.5V,$
Turn-Off Delay Time	t _{D(off)}		93		ns	$R_{GEN} = 6\Omega$, $I_D = 3.2A$
Turn-Off Fall Time	t _f		48	_	ns	

- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided. 7. Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design. Not subject to production testing.





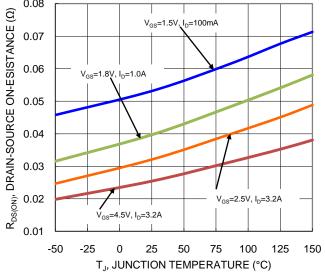
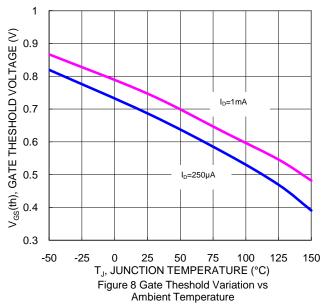
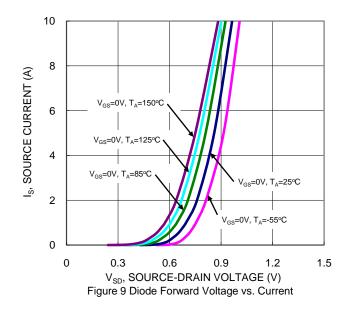
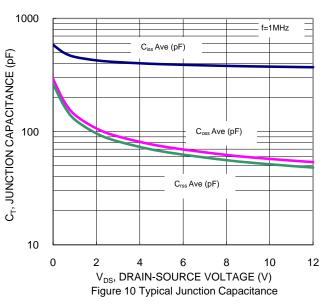
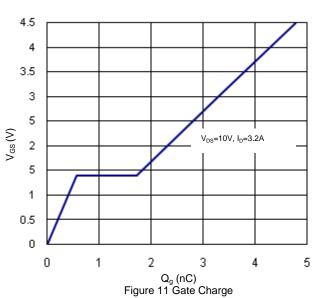


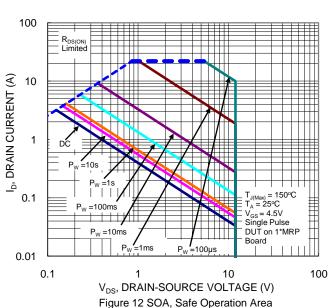
Figure 7 On-Resistance Variation with Temperature







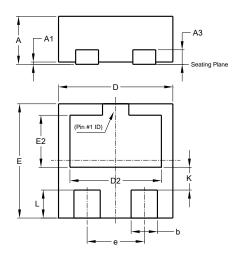






Package Outline Dimensions

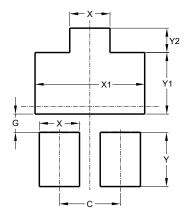
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



2	X2-DFN1010-3							
Dim	Min	Max	Тур					
Α	-	0.40	0.39					
A1	0.00	0.05	0.02					
A3	-	-	0.13					
b	0.18	0.28	0.23					
D	0.95	1.05	1.00					
D2	0.70	0.90	0.80					
E	0.95	1.05	1.00					
E2	0.36	0.56	0.46					
е	-	-	0.50					
K	-	-	0.20					
L	0.195	0.295	0.245					
All Dimensions in mm								

Suggested Pad Layout

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



X2-DFN1010-3				
Dimensions	Value			
С	0.500			
G	0.150			
Х	0.330			
X1	0.900			
Υ	0.445			
Y1	0.505			
Y2	0.200			
All Dimensions in mm				



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