



#### P-CHANNEL ENHANCEMENT MODE MOSFET

### **Product Summary**

V <sub>(BR)DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
	100mΩ @ V <sub>GS</sub> = -4.5 V	-2A
-12V	160mΩ @ V <sub>GS</sub> = -2.5V	-1A
	200mΩ @ V <sub>GS</sub> = -1.8V	-0.5A
	380mΩ @ V <sub>GS</sub> = -1.5V	-0.2A

#### **Features and Benefits**

- Low On-Resistance
- ESD Protected Gate
- Low Input/Output Leakage
- · Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

# **Description and Applications**

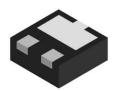
This new generation MOSFET is designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Power Management Functions
- Backlighting
- Load Switch

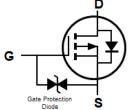
#### **Mechanical Data**

- Case: X2-DFN1010-3
- Case Material: Molded Plastic, "Green" Molding Compound.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish NiPdAu Annealed over Copper Leadframe.
  Solderable per MIL-STD-202, Method 208 4
- Weight: 0.0015 grams (Approximate)

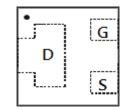




X2-DFN1010-3







Pin-out Top view

### Ordering Information (Note 4)

Part Number	Case	Packaging		
DMP1200UFR4-7	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.
- 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**



12 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: Y = 2011) M = Month (ex: 9 = September)

Date Code Key

Year	201	1	2012		2013	20	014	2015		2016	2	2017
Code	Υ		Z		Α		В	С		D		Е
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<sub>A</sub> = +25°C unless otherwise specified.)

Chara	cteristic		Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	-12	V
Gate-Source Voltage			V <sub>GSS</sub>	±8	V
Drain Current (Note 6)	Steady	$T_A = +25^{\circ}C$	$I_{D}$	2	Α

#### **Thermal Characteristics**

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	$P_{D}$	0.48	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	$R_{ hetaJA}$	266	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.26	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 6)	$R_{ hetaJA}$	102	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

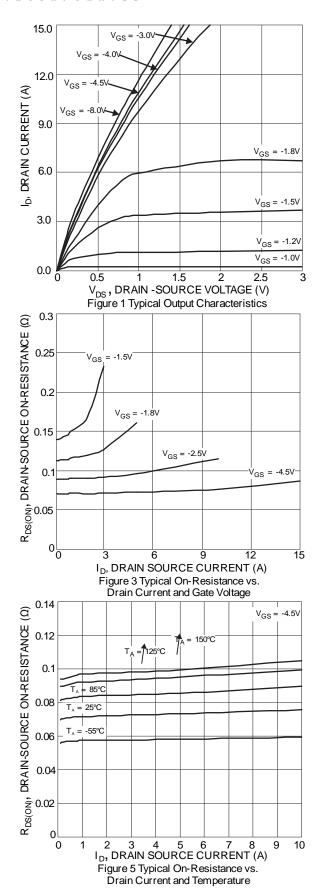
# Electrical Characteristics (@T<sub>A</sub> = +25°C unless otherwise specified.)

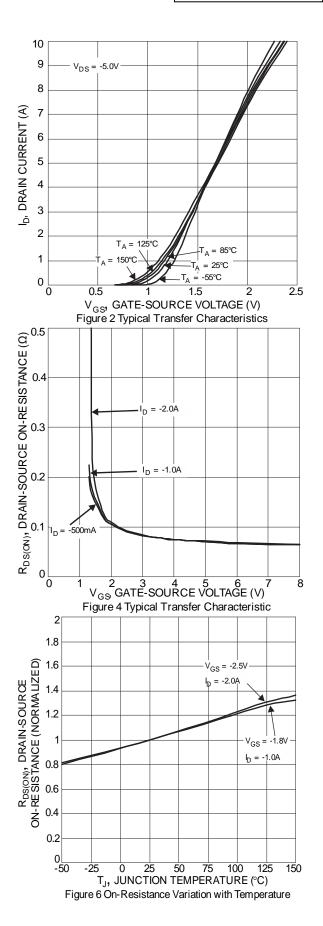
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition		
OFF CHARACTERISTICS (Note 7)								
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-12	_	_	V	$V_{GS} = 0V, I_D = -250\mu A$		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	_	_	-1	μA	V <sub>DS</sub> = -9.6V, V <sub>GS</sub> = 0V		
Gate-Source Leakage	I <sub>GSS</sub>	_	_	±10	μA	$V_{GS} = \pm 6V$ , $V_{DS} = 0V$		
ON CHARACTERISTICS (Note 7)								
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.35	_	-1.0	>	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$		
Static Drain-Source On-Resistance	R <sub>DS</sub> (ON)	_	70 90 115 145	100 160 200 380	mΩ	$V_{GS} = -4.5V$ , $I_D = -2A$ $V_{GS} = -2.5V$ , $I_D = -1A$ $V_{GS} = -1.8V$ , $I_D = -0.5A$ $V_{GS} = -1.5V$ , $I_D = -0.2A$		
Forward Transfer Admittance	Y <sub>fs</sub>	40	_	_	mS	$V_{DS} = -5V, I_{D} = -0.5A$		
Diode Forward Voltage	V <sub>SD</sub>	_	_	-1.2	V	$V_{GS} = 0V, I_S = -0.2A$		
DYNAMIC CHARACTERISTICS (Note 8)								
Input Capacitance	C <sub>iss</sub>	_	514		рF	., 5), ), 6), (		
Output Capacitance	Coss	_	131		рF	V <sub>DS</sub> = -5V, V <sub>GS</sub> = 0V, f = -1.0MHz		
Reverse Transfer Capacitance	Crss	_	60	_	pF	1.01011 12		
Total Gate Charge	$Q_g$	_	5.8		nC	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -5V,		
Gate-Source Charge	$Q_{gs}$	_	0.8	_	nC			
Gate-Drain Charge	$Q_{gd}$	_	1.2		nC	ID = -2A		
Turn-On Delay Time	t <sub>D(on)</sub>	_	15	1	nS			
Turn-On Rise Time	t <sub>r</sub>	_	62		nS	$V_{DD} = -5V, V_{GEN} = -4.5V,$		
Turn-Off Delay Time	t <sub>D(off)</sub>	_	332		nS	$R_{GEN} = 6\Omega$		
Turn-Off Fall Time	t <sub>f</sub>	_	166	_	nS			

Notes:

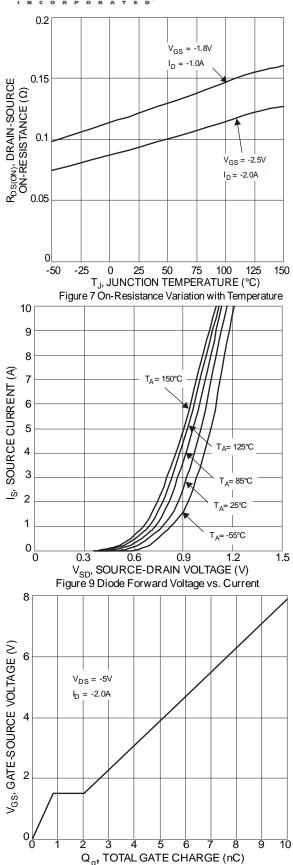
- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
- 7. Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design. Not subject to production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











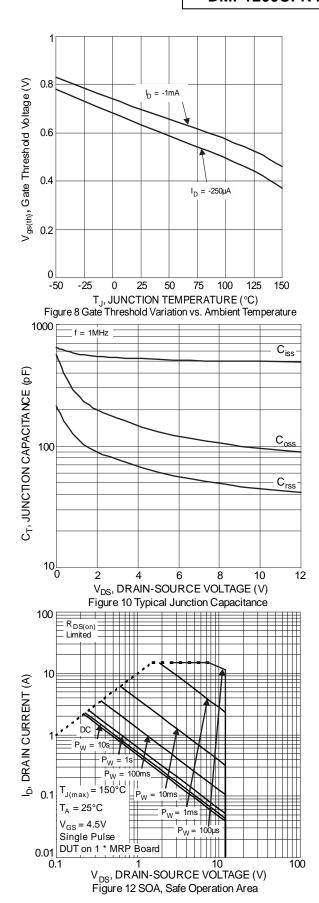
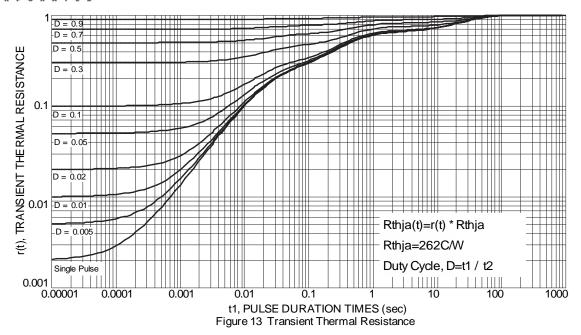


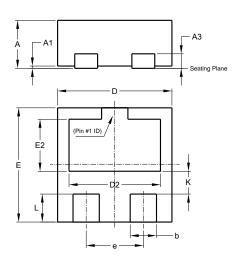
Figure 11 Gate-Charge Characteristics





# **Package Outline Dimensions**

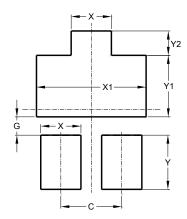
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



X2-DFN1010-3							
Dim	Min	Max	Тур				
Α	-	0.40	0.39				
A1	0.00	0.05	0.02				
А3	-	-	0.13				
b	0.18	0.28	0.23				
D	0.95	1.05	1.00				
D2	0.70	0.90	0.80				
Е	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			
Y	0.445			
Y1	0.505			
Y2	0.200			
All Dimensions in mm				



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