NEW PRODUCT

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D T_A = +25°C
-12V	100mΩ @ V_{GS} = -4.5 V	-2A
	160mΩ @ V_{GS} = -2.5V	-1A
	200mΩ @ V_{GS} = -1.8V	-0.5A
	380mΩ @ V_{GS} = -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

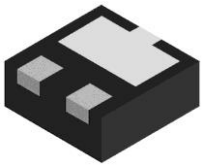
This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

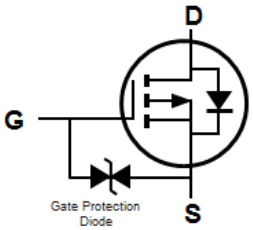
- Power Management Functions
- Backlighting
- Load Switch

Mechanical Data

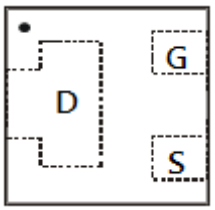
- Case: X2-DFN1010-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish - NiPdAu Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.0015 grams (Approximate)

X2-DFN1010-3





Equivalent Circuit



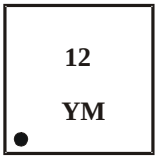
Pin-out Top view

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.
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



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

Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

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

NEW PRODUCT

Maximum Ratings (@T_A = +25°C unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-12	V
Gate-Source Voltage			V_{GSS}	±8	V
Drain Current (Note 6)	Steady	T_A = +25°C	I_D	2	A

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P_D	0.48	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 5)	$R_{\theta JA}$	266	°C/W
Total Power Dissipation (Note 6)	P_D	1.26	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 6)	$R_{\theta JA}$	102	°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 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-12	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -9.6V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±6V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.35	—	-1.0	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	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	$\|Y_{fs}\|$	40	—	—	mS	V_{DS} = -5V, I_D = -0.5A
Diode Forward Voltage	V_{SD}	—	—	-1.2	V	V_{GS} = 0V, I_S = -0.2A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	514	—	pF	V_{DS} = -5V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	131	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	60	—	pF	
Total Gate Charge	Q_g	—	5.8	—	nC	V_{GS} = -4.5V, V_{DS} = -5V, I_D = -2A
Gate-Source Charge	Q_{gs}	—	0.8	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.2	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	15	—	nS	V_{DD} = -5V, V_{GEN} = -4.5V, R_{GEN} = 6Ω
Turn-On Rise Time	t_r	—	62	—	nS	
Turn-Off Delay Time	$t_{D(off)}$	—	332	—	nS	
Turn-Off Fall Time	t_f	—	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.

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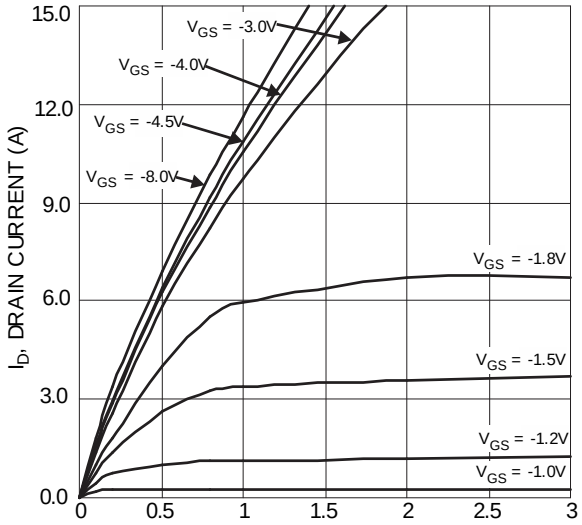

Figure 1 Typical Output Characteristics

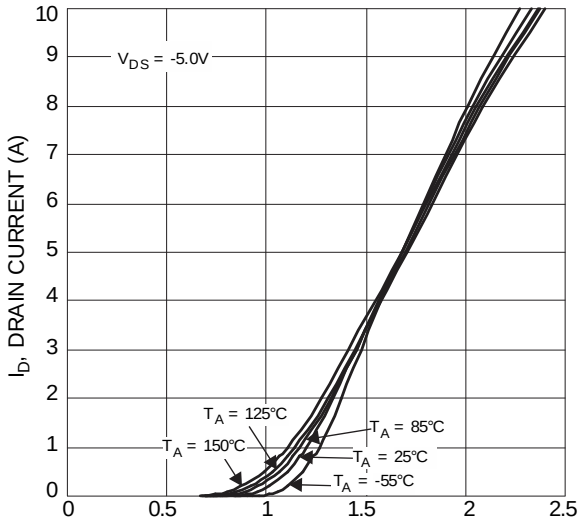

Figure 2 Typical Transfer Characteristics

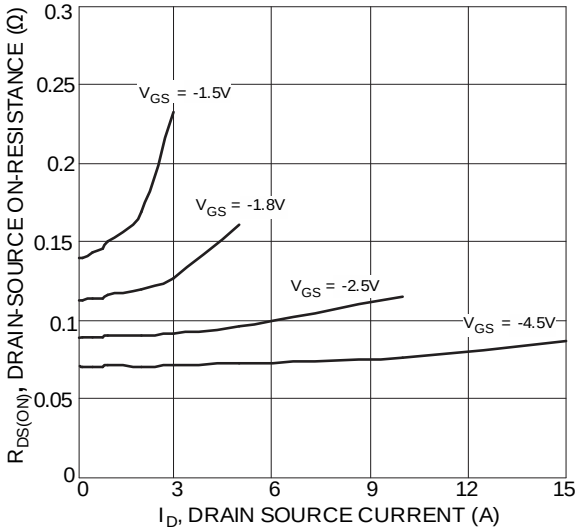

Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

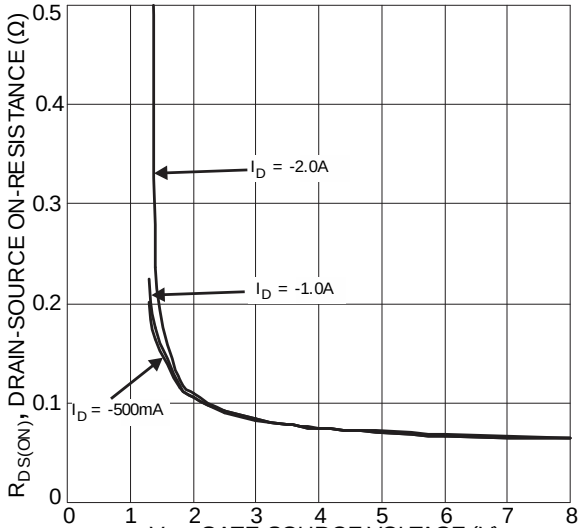

Figure 4 Typical Transfer Characteristic

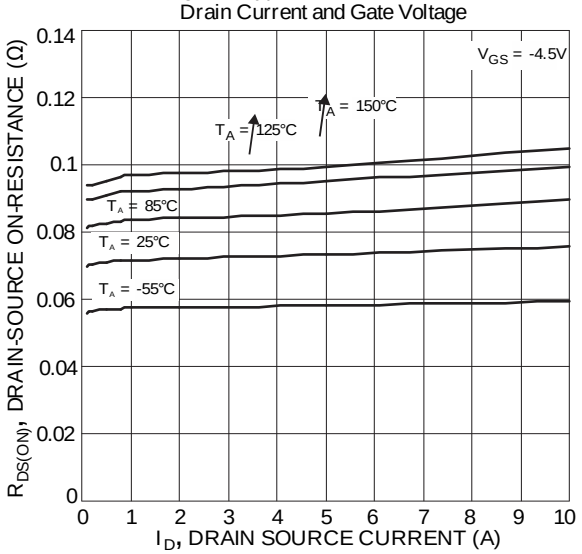

Figure 5 Typical On-Resistance vs.
Drain Current and Temperature

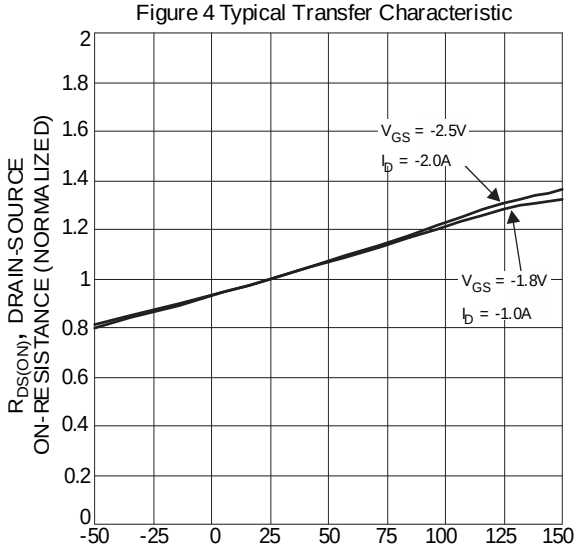

Figure 6 On-Resistance Variation with Temperature

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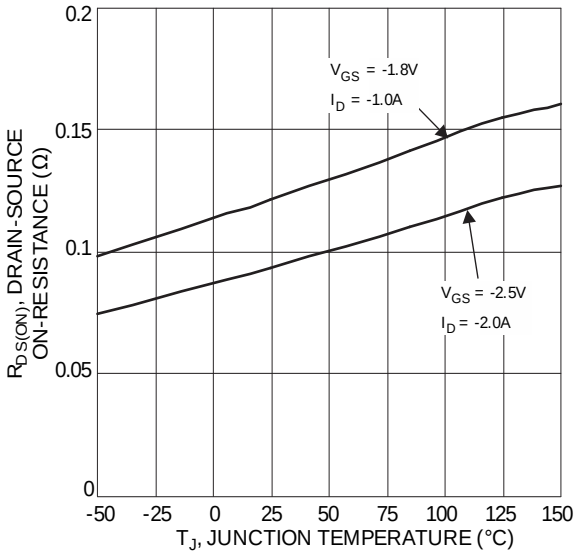

Figure 7 On-Resistance Variation with Temperature

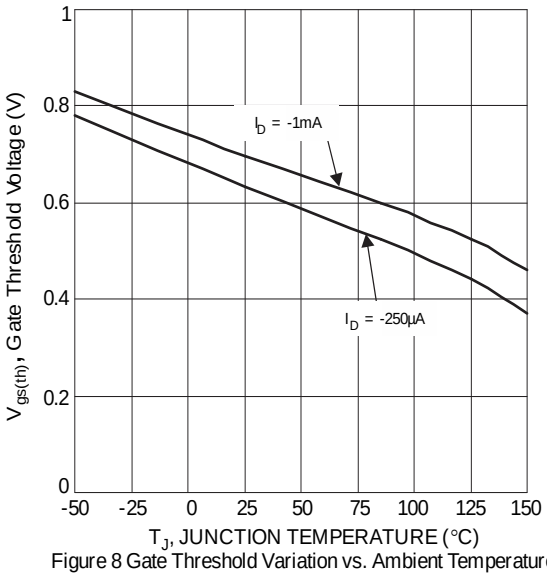

Figure 8 Gate Threshold Variation vs. Ambient Temperature

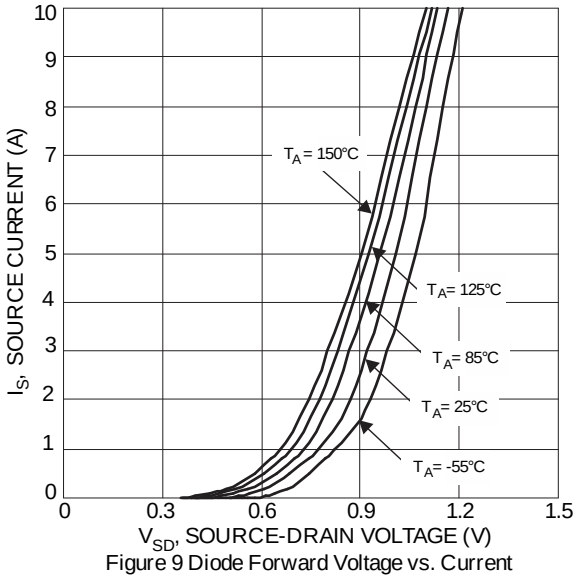

Figure 9 Diode Forward Voltage vs. Current

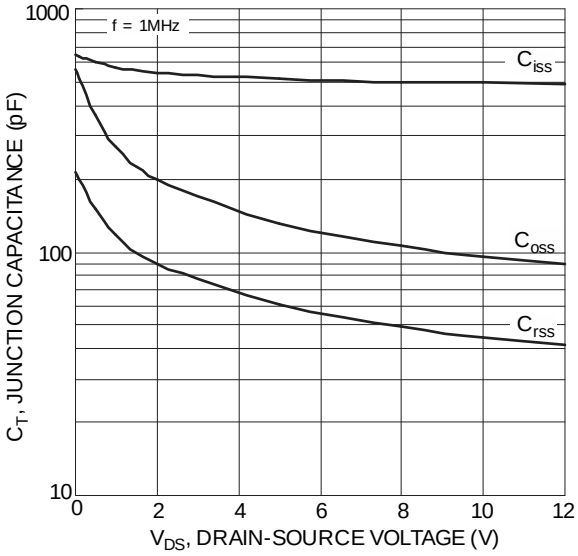

Figure 10 Typical Junction Capacitance

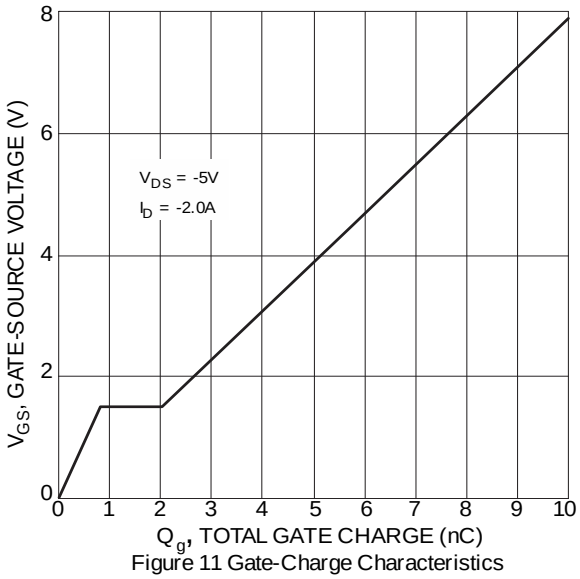

Figure 11 Gate-Charge Characteristics

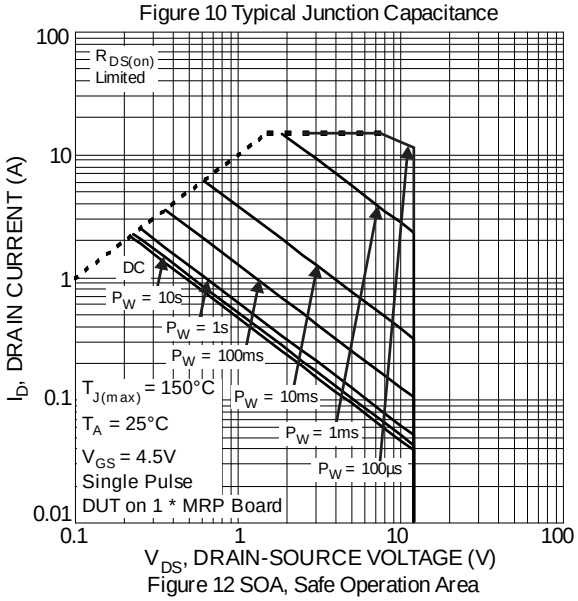

Figure 12 SOA, Safe Operation Area

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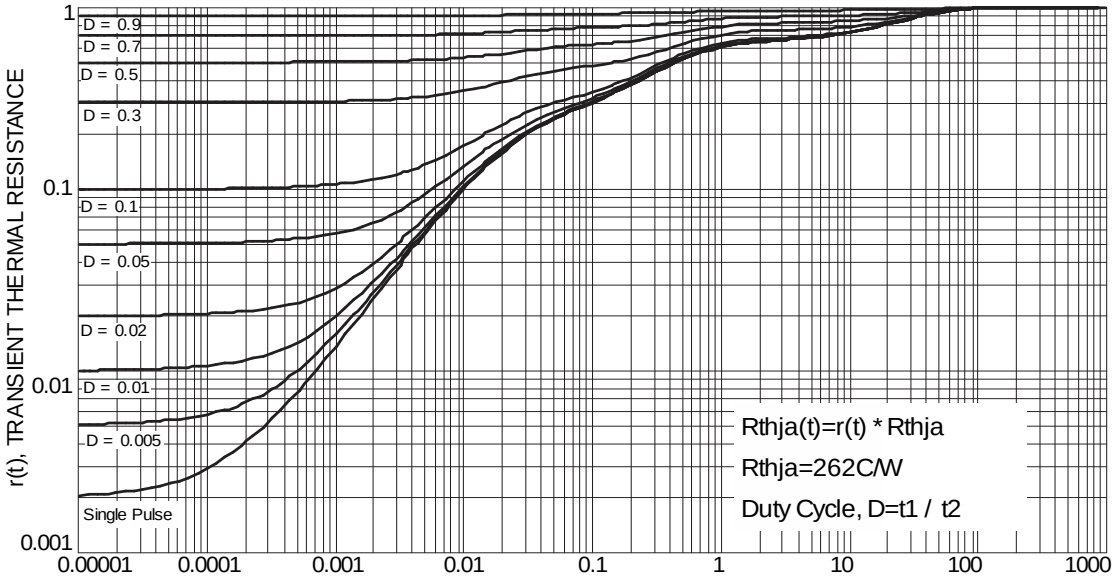
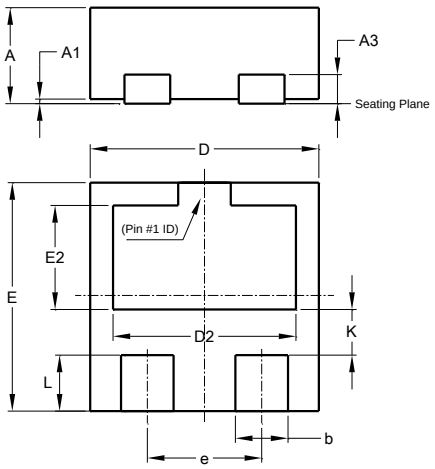


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

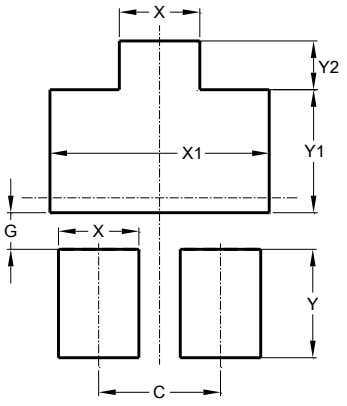
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



X2-DFN1010-3			
Dim	**Min**	**Max**	**Typ**
A	-	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
e	-	-	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**
C	0.500
G	0.150
X	0.330
X1	0.900
Y	0.445
Y1	0.505
Y2	0.200
All Dimensions in mm	

NEW PRODUCT

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