

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ C$
60V	$2\Omega @ V_{GS} = 4V$	400mA
	$2.5\Omega @ V_{GS} = 2.5V$	350mA

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.

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

Features and Benefits

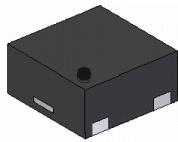
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

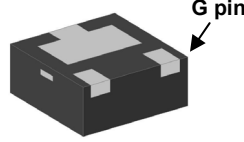
- Case: X1-DFN1212-3
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approximate)

NEW PRODUCT

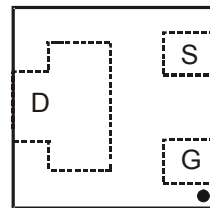

ESD PROTECTED



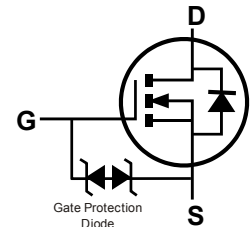
Top View



Bottom View



Pin-Out Top View

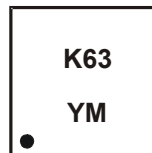
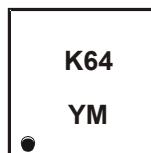


Equivalent Circuit

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
DMN62D1LFD-7	Standard	X1-DFN1212-3	3,000/Tape & Reel
DMN62D1LFD-13	Standard	X1-DFN1212-3	10,000/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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information


K64 = Product Type Marking Code
 K63 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: B = 2014)
 M = Month (ex: 9 = September)

Date Code Key

Year	2013	2014	2015	2016	2017	2018	2019	2020	2010
Code	A	B	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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V_{DSS}	60	V	
Gate-Source Voltage	V_{GSS}	± 20	V	
Continuous Drain Current (Note 5) $V_{GS} = 4\text{V}$	I_D	$T_A = +25^\circ\text{C}$	400	mA
		$T_A = +70^\circ\text{C}$	310	
Pulsed Drain Current (Note 6)	I_{DM}	200	mA	

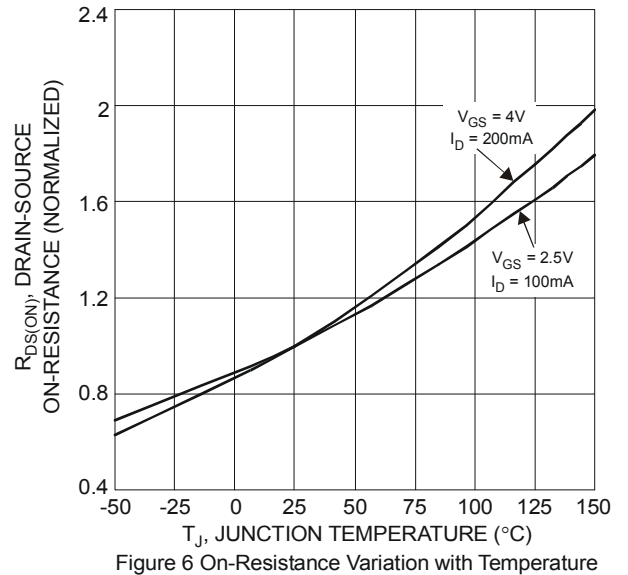
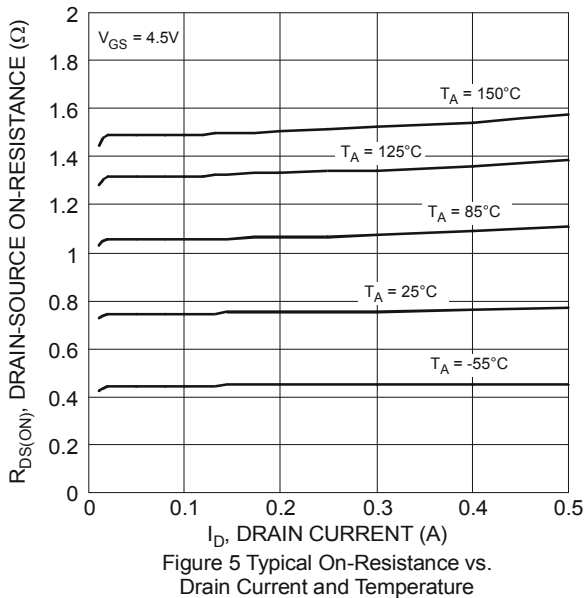
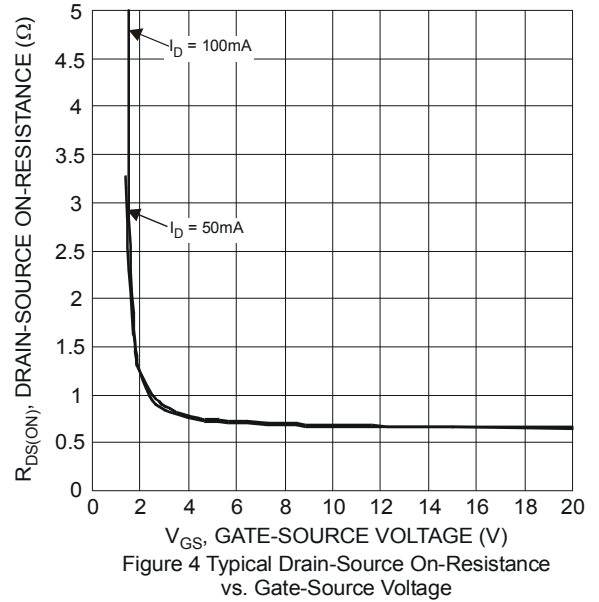
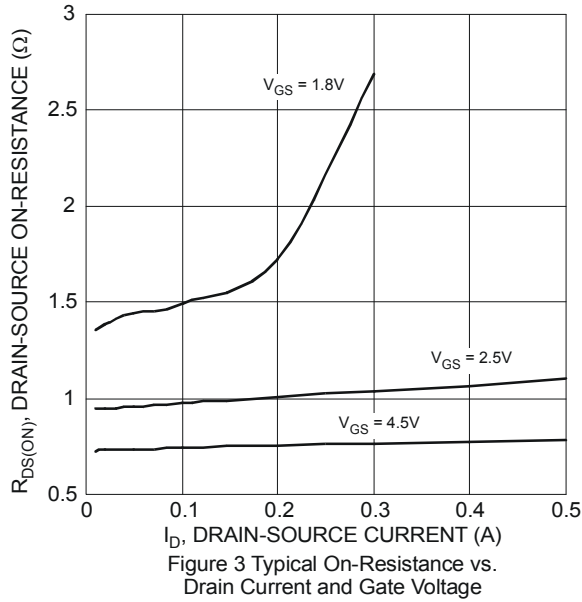
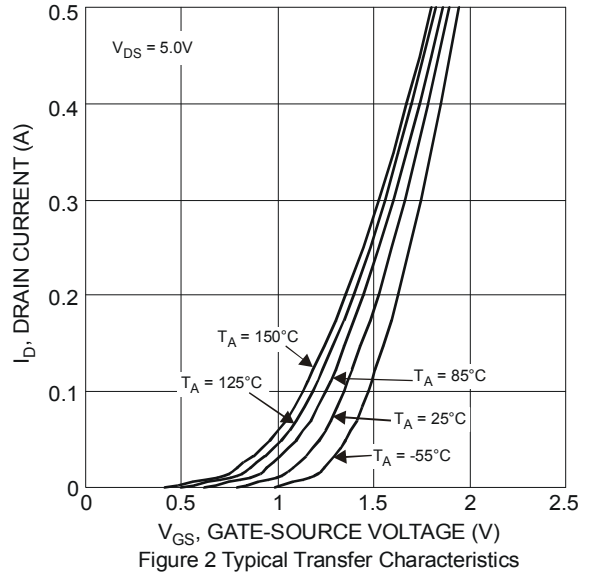
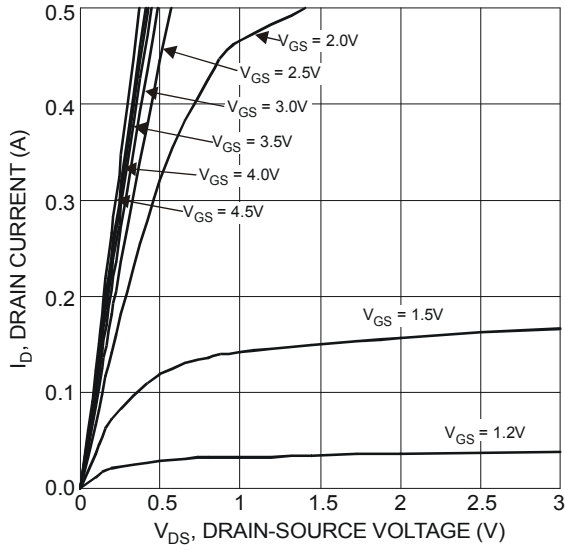
Thermal Characteristics

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5)	P_D	0.5	W
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 5)	$R_{\theta JA}$	237	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	I_{DSS}	—	—	1	μA	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 5\text{V}, V_{DS} = 0\text{V}$
		—	—	± 500	nA	$V_{GS} = \pm 10\text{V}, V_{DS} = 0\text{V}$
		—	—	± 2	μA	$V_{GS} = \pm 15\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.6	—	1	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	0.8	2	Ω	$V_{GS} = 4\text{V}, I_D = 100\text{mA}$
		—	1	2.5		$V_{GS} = 2.5\text{V}, I_D = 50\text{mA}$
		—	1.4	3		$V_{GS} = 1.8\text{V}, I_D = 50\text{mA}$
		—	1.8	—		$V_{GS} = 1.5\text{V}, I_D = 10\text{mA}$
Forward Transfer Admittance	$ Y_{fs} $	—	1.8	—	S	$V_{DS} = 10\text{V}, I_D = 200\text{mA}$
Diode Forward Voltage	V_{SD}	—	0.8	1.3	V	$V_{GS} = 0\text{V}, I_S = 115\text{mA}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	36	—	pF	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	4.6	—		
Reverse Transfer Capacitance	C_{rss}	—	3.6	—		
Gate Resistance	R_g	—	59.8	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	Q_g	—	0.55	—	nC	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 250\text{mA}$
Gate-Source Charge	Q_{gs}	—	0.08	—		
Gate-Drain Charge	Q_{gd}	—	0.12	—		
Turn-On Delay Time	$t_{D(on)}$	—	2.1	—	ns	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}, R_L = 150\Omega, R_G = 25\Omega, I_D = 200\text{mA}$
Turn-On Rise Time	t_r	—	2.8	—		
Turn-Off Delay Time	$t_{D(off)}$	—	21	—		
Turn-Off Fall Time	t_f	—	13.9	—		

- Notes:
- Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 - Repetitive rating, pulse width limited by junction temperature.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.



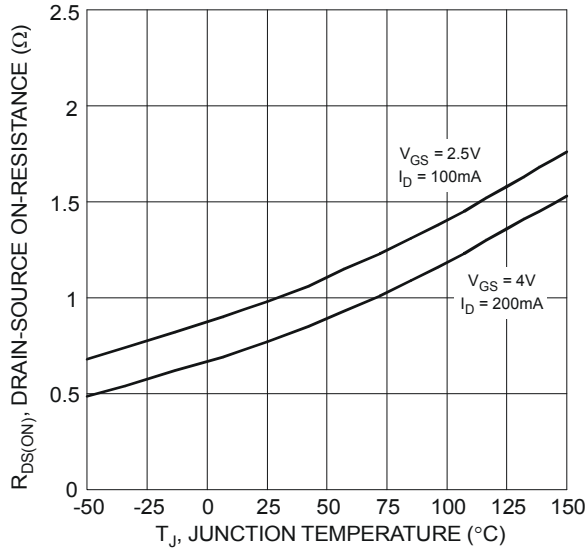


Figure 7 On-Resistance Variation with Temperature

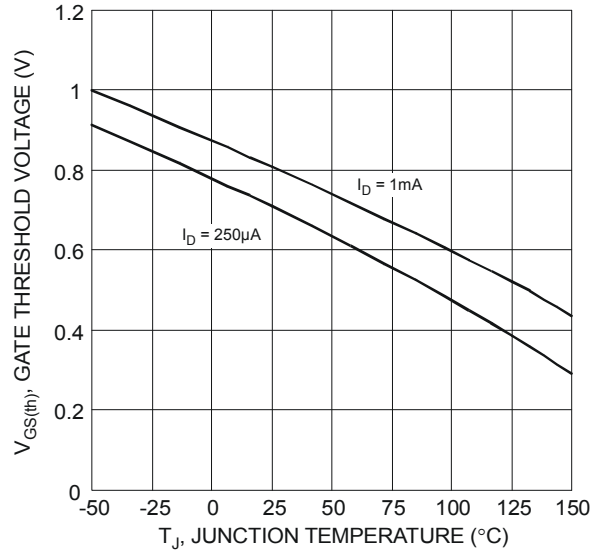


Figure 8 Gate Threshold Variation vs. Ambient Temperature

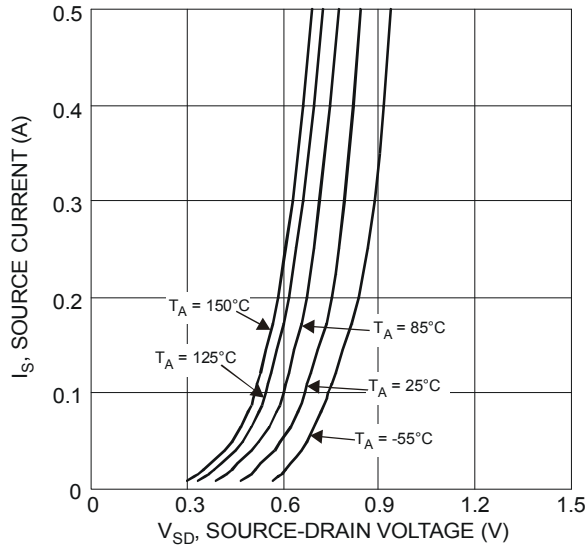


Figure 9 Diode Forward Voltage vs. Current

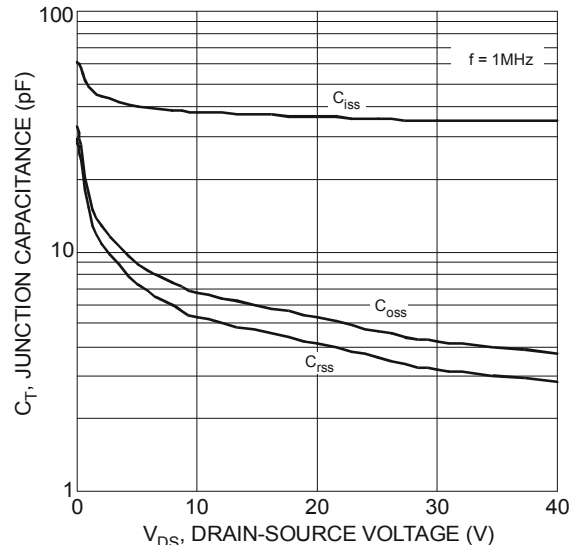


Figure 10 Typical Junction Capacitance

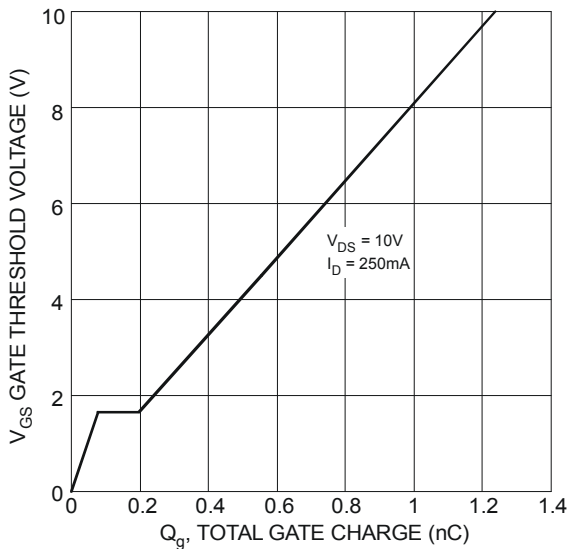


Figure 11 Gate Charge

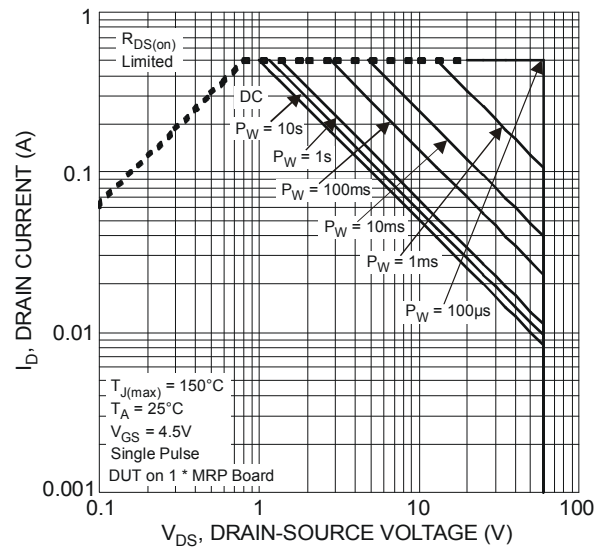


Figure 12 SOA, Safe Operation Area

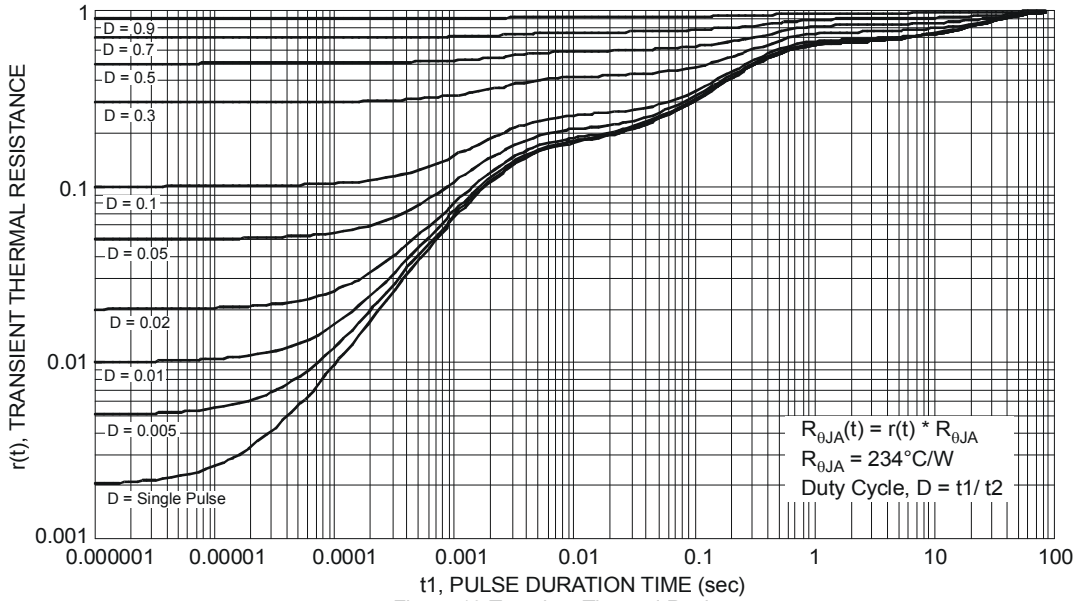
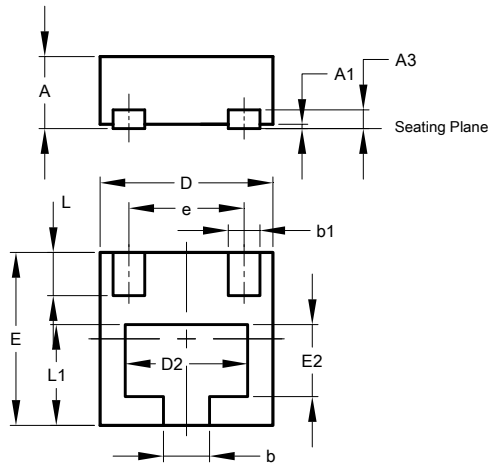


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

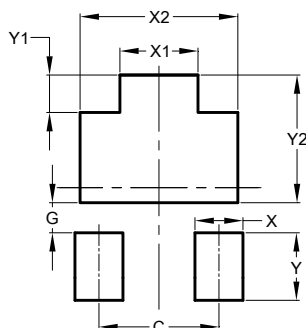
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



U-DFN1212-3 Type C			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.02
A3	-	-	0.13
b	0.27	0.37	0.32
b1	0.17	0.27	0.22
D	1.15	1.25	1.20
D2	0.75	0.95	0.85
e	-	-	0.80
E	1.15	1.25	1.20
E2	0.40	0.60	0.50
L	0.25	0.35	0.30
L1	0.65	0.75	0.70
All Dimensions in mm			

Suggested Pad Layout

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



U-DFN1212-3 Type C	
Dimensions	Value
C	0.800
G	0.200
X	0.320
X1	0.520
X2	1.050
Y	0.450
Y1	0.250
Y2	0.850
All Dimensions in mm	

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