

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
60V	2Ω @ V _{GS} = 4V	400mA
	2.5Ω @ V _{GS} = 2.5V	350mA

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.

- 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

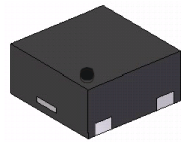
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

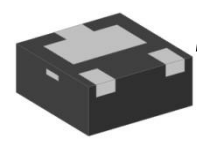
- Case: U-DFN1212-3 (Type C)
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ^(e4)
- Terminal Connections: See Diagram
- Weight: 0.005 grams (Approximate)



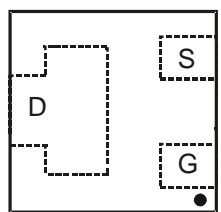
ESD PROTECTED



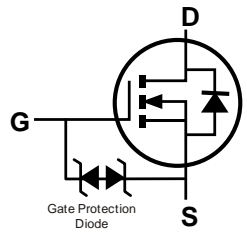
Top View



Bottom View



Pin-Out Top View



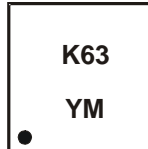
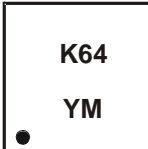
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
DMN62D1LFD-7	Standard	U-DFN1212-3 (Type C)	3,000/Tape & Reel
DMN62D1LFD-13	Standard	U-DFN1212-3 (Type C)	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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



K64 = Product Type Marking Code
 K63 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Code	A	B	C	D	E	F	G	H	I	J	K	L	M

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
		$T_A = +70^\circ\text{C}$	310
Pulsed Drain Current (Note 6)	I_{DM}	1	A

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	$^\circ\text{C}/\text{W}$
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	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	21	—	ns	
Turn-Off Fall Time	t_F	—	13.9	—	ns	

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

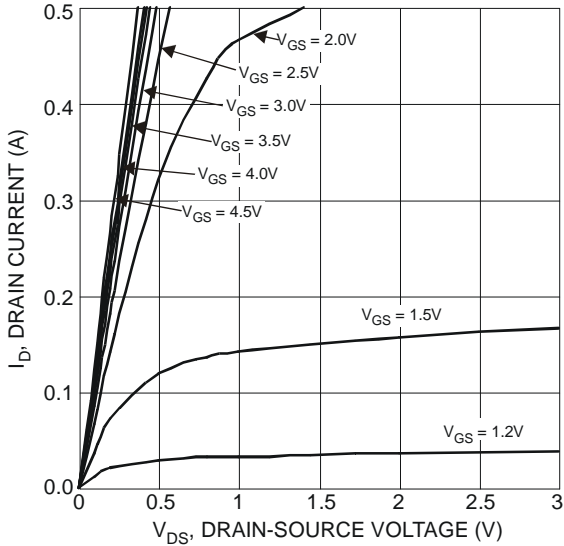


Figure 1 Typical Output Characteristics

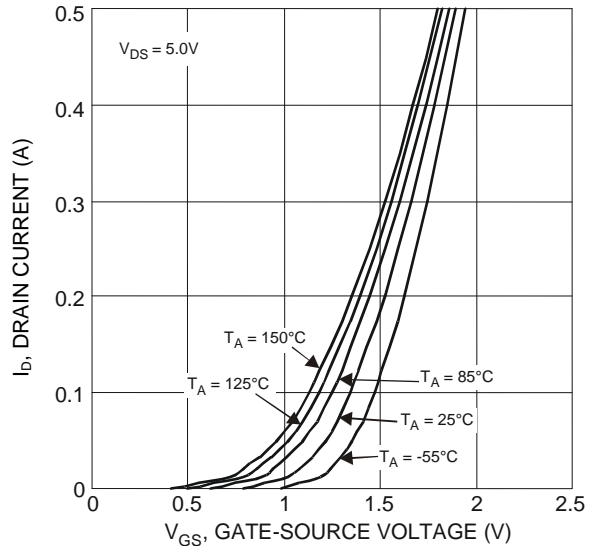


Figure 2 Typical Transfer Characteristics

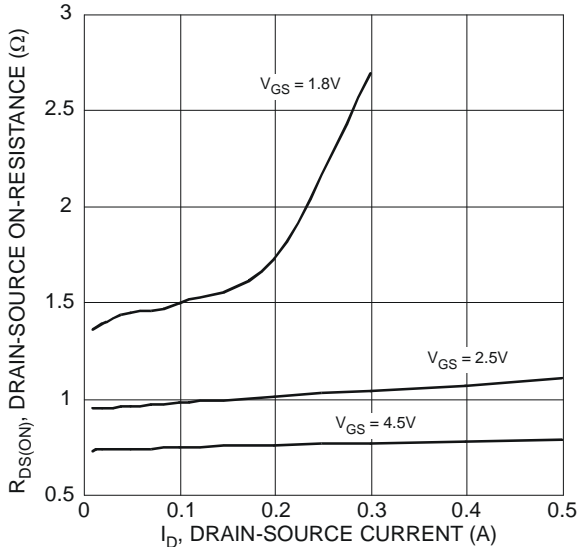


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

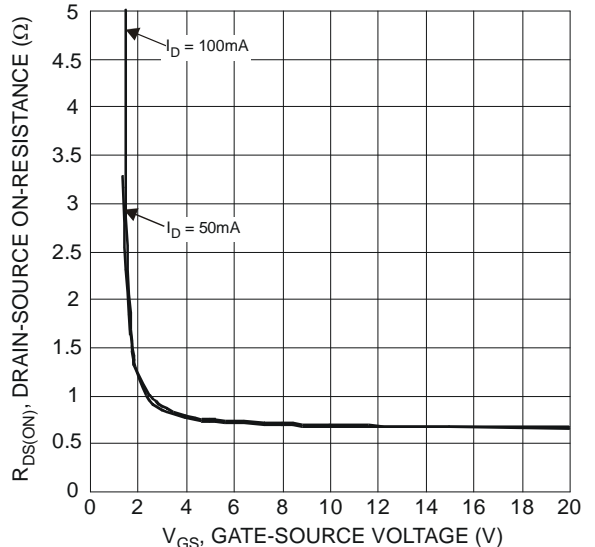


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

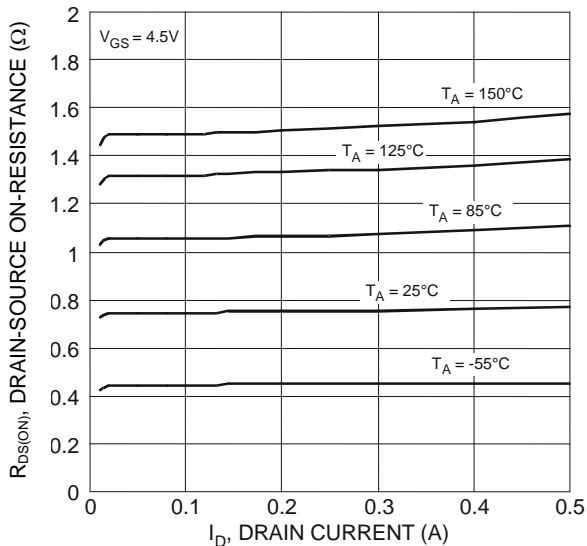


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

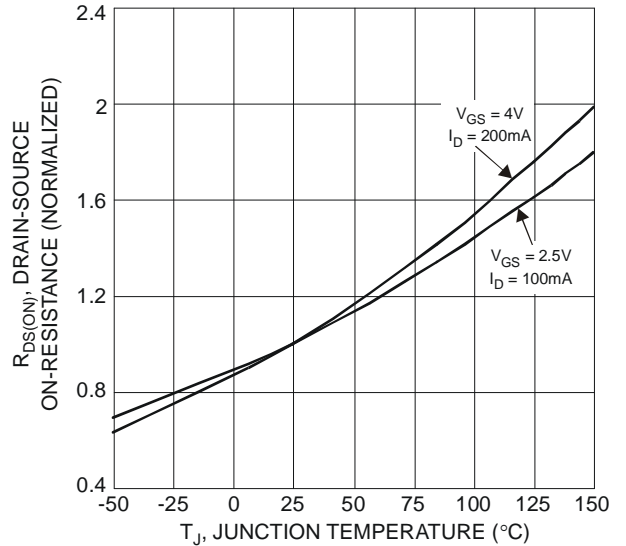


Figure 6 On-Resistance Variation with Temperature

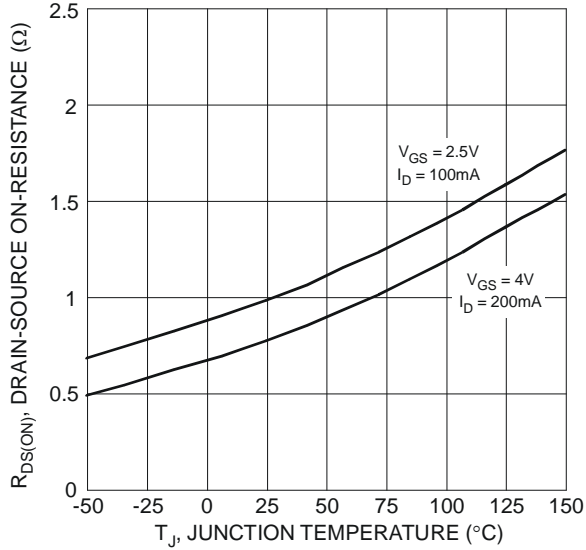


Figure 7 On-Resistance Variation with Temperature

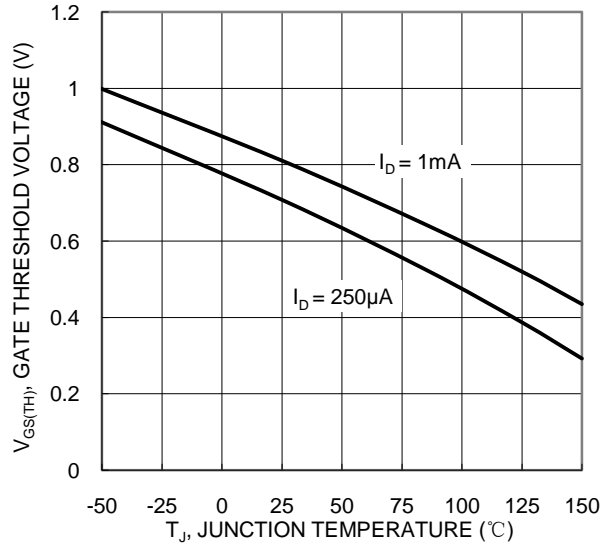


Figure 8 Gate Threshold Variation vs Junction Temperature

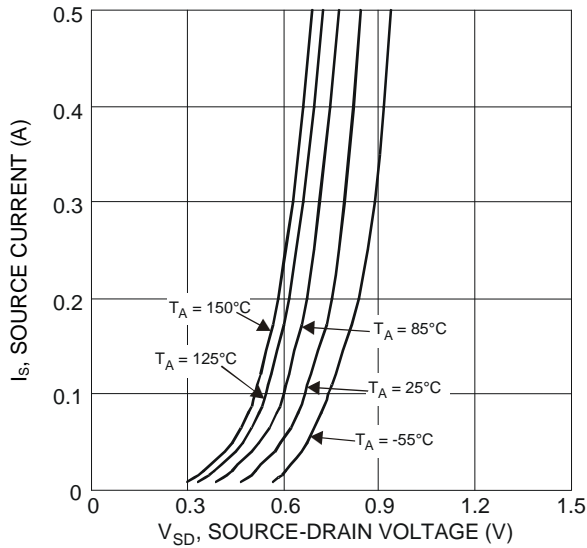


Figure 9 Diode Forward Voltage vs. Current

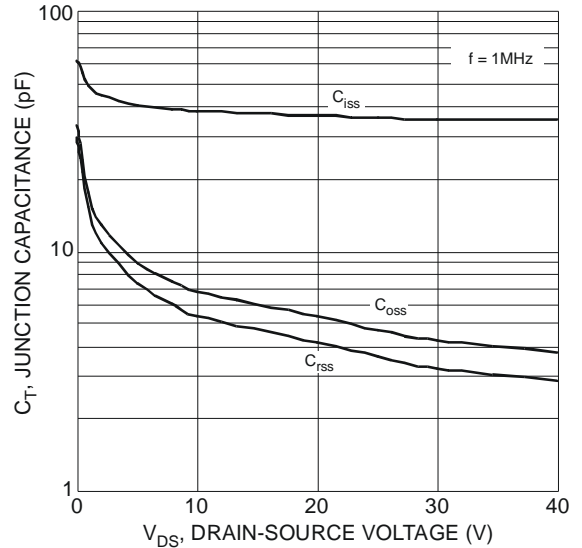


Figure 10 Typical Junction Capacitance

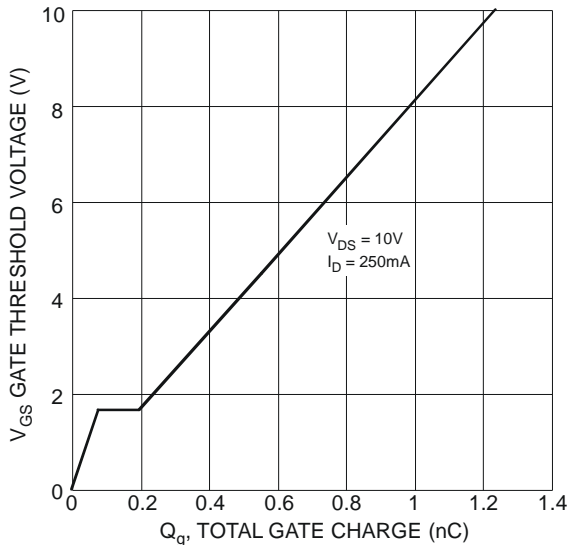


Figure 11 Gate Charge

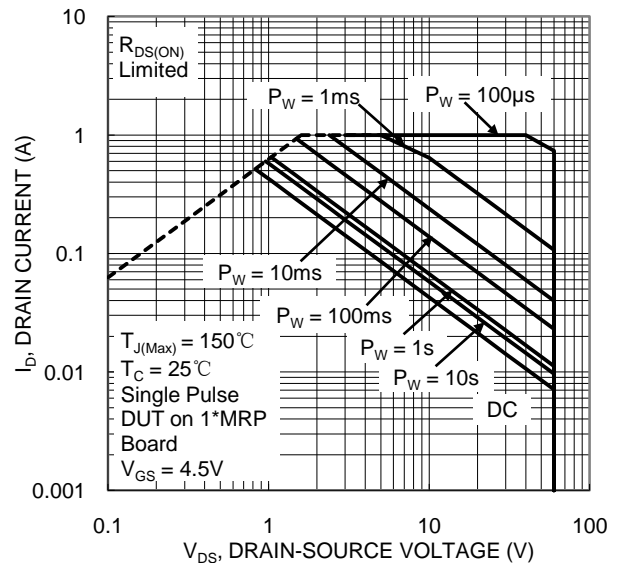


Figure 12 SOA, Safe Operation Area

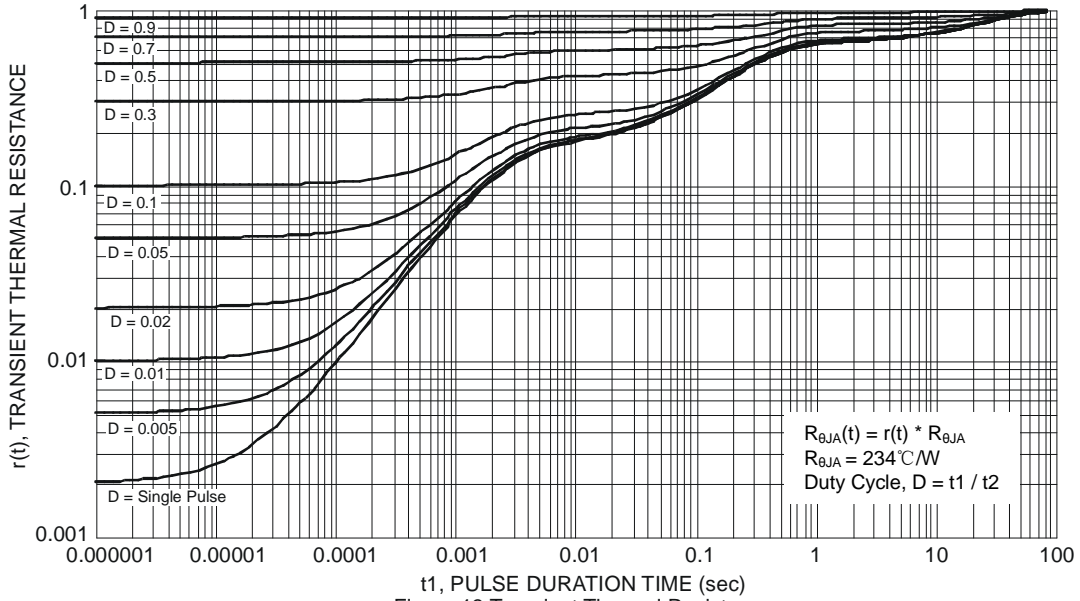
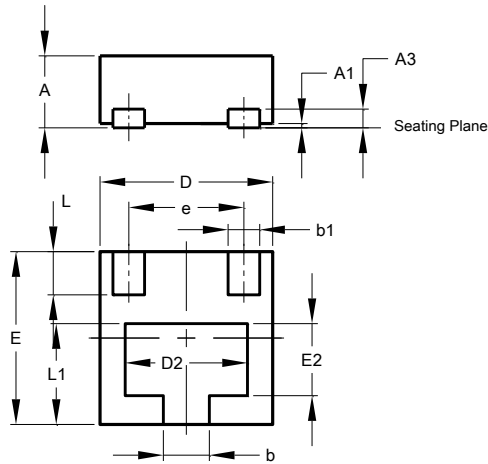


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

U-DFN1212-3 (Type C)

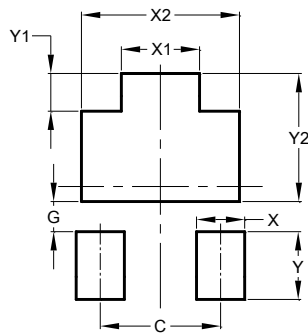


U-DFN1212-3 Type C			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.02
A3	-	-	0.13
b	0.27	0.37	0.32
b1	0.17	0.27	0.22
D	1.15	1.25	1.20
D2	0.75	0.95	0.85
e	-	-	0.80
E	1.15	1.25	1.20
E2	0.40	0.60	0.50
L	0.25	0.35	0.30
L1	0.65	0.75	0.70
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

U-DFN1212-3 (Type C)



Dimensions	Value (in mm)
C	0.800
G	0.200
X	0.320
X1	0.520
X2	1.050
Y	0.450
Y1	0.250
Y2	0.850

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