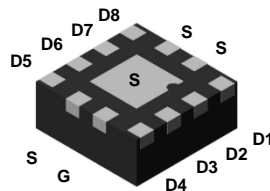


## Features

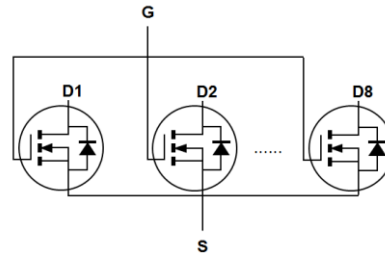
- Low Gate Charge
- $R_{DS(ON)}$ : 280m $\Omega$  @  $V_{GS} = 4.5V$  (Single MOSFET)
- 8 N-Channel MOSFET in 1 Device
- Common Source
- Small Footprint 1.5mm x 1.5mm
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: U-QFN1515-12
- Case Material - Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208③
- Terminal Connections: See Diagram
- Weight: 0.004 grams (Approximate)

**U-QFN1515-12**


Bottom View



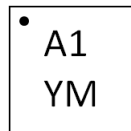
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN1250UFEL-7	U-QFN1515-12	3,000/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](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

**U-QFN1515-12**


- A1 = Product Type Marking Code
- YM = Date Code Marking
- Y = Year (ex: B = 2014)
- M = Month (ex: 8 = August)

### Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020	2021
Code	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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	12	V
Gate-Source Voltage	V <sub>GSS</sub>	±8	V
Drain Current (Note 6) Continuous	I <sub>D</sub>	T <sub>A</sub> = +25°C	2.0
		T <sub>A</sub> = +70°C	1.6
Pulsed Drain Current (Note 7)	I <sub>DM</sub>	10	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.66	W
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.25	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	177	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	100	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- Device mounted on 1"x1", FR-4 PC board with minimum recommended pad layout, and test with single MOSFET.
  - Device mounted on 1"x1", FR-4 PC board with 2 oz. copper, and test with single MOSFET.
  - Repetitive Rating, pulse width limited by junction temperature, and test with single MOSFET.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>STATIC CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	12	—	—	V	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 12V, V <sub>GS</sub> = 0V
Gate-Body Leakage Current	I <sub>GSS</sub>	—	—	±100	nA	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±8V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.4	—	1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(ON)</sub>	—	280	450	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 0.2A
		—	360	550	mΩ	V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 0.1A
Forward Transfer Admittance	Y <sub>FS</sub>	—	1	—	S	V <sub>DS</sub> = 6V, I <sub>D</sub> = 0.2A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	0.8	1.0	V	I <sub>S</sub> = 0.2A, V <sub>GS</sub> = 0V
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	146	190	pF	V <sub>DS</sub> = 6V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	10	15	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	8	13	pF	
Gate Resistance	R <sub>G</sub>	—	2.4	—	Ω	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz
<b>SWITCHING CHARACTERISTICS (Note 9)</b>						
Total Gate Charge	Q <sub>g</sub>	—	1.3	1.9	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 6V, I <sub>D</sub> = 0.2A
Gate-Source Charge	Q <sub>gs</sub>	—	0.3	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.1	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	1.9	2.7	nS	V <sub>DD</sub> = 6V, V <sub>GS</sub> = 4.5V, R <sub>L</sub> = 22Ω, R <sub>G</sub> = 6Ω
Turn-On Rise Time	t <sub>R</sub>	—	1.3	—	nS	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	7.5	11	nS	
Turn-Off Fall Time	t <sub>F</sub>	—	1.0	—	nS	

- Notes:
- Test pulse width t = 300ms, test with single MOSFET.
  - Guaranteed by design with single MOSFET, not subject to production testing.

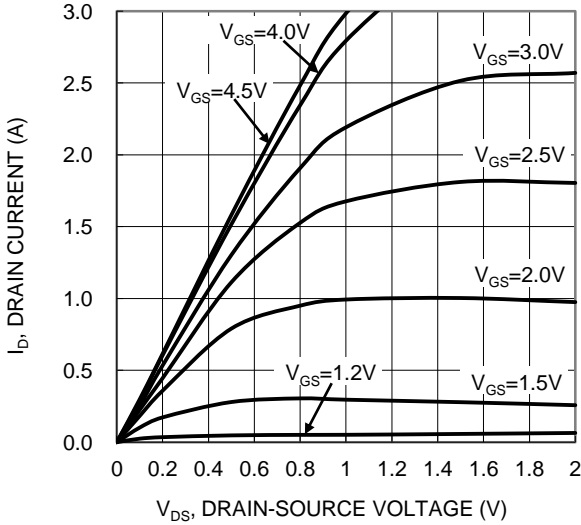


Figure 1. Typical Output Characteristic

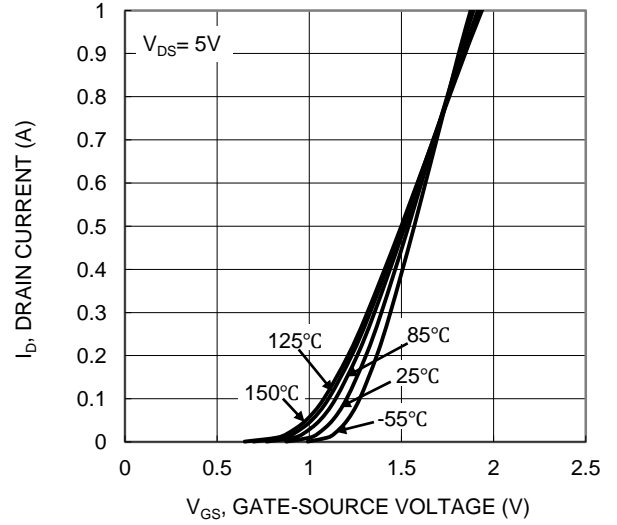


Figure 2. Typical Transfer Characteristic

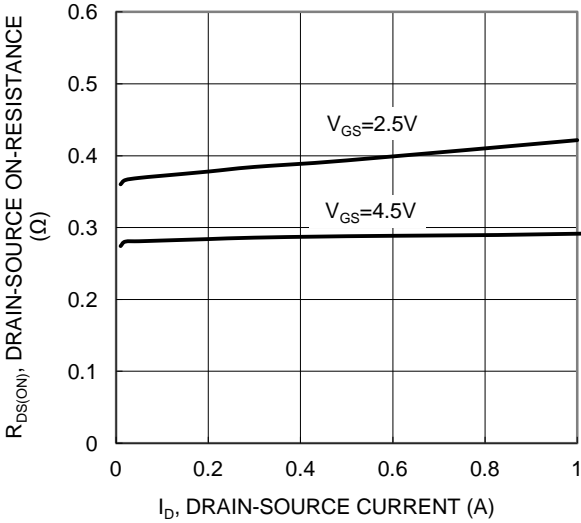


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

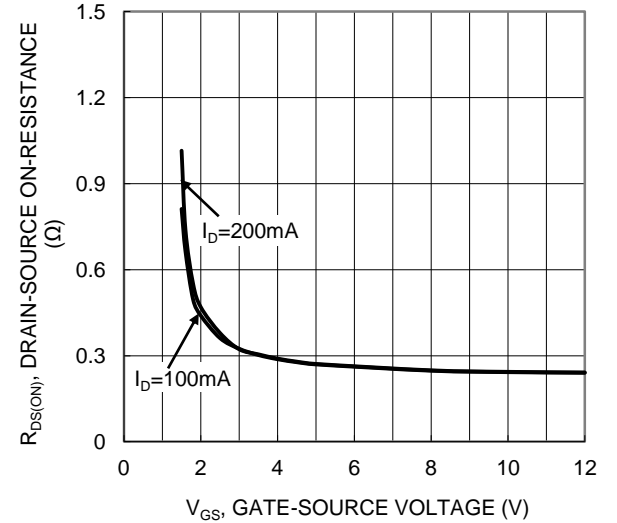


Figure 4. Typical Transfer Characteristic

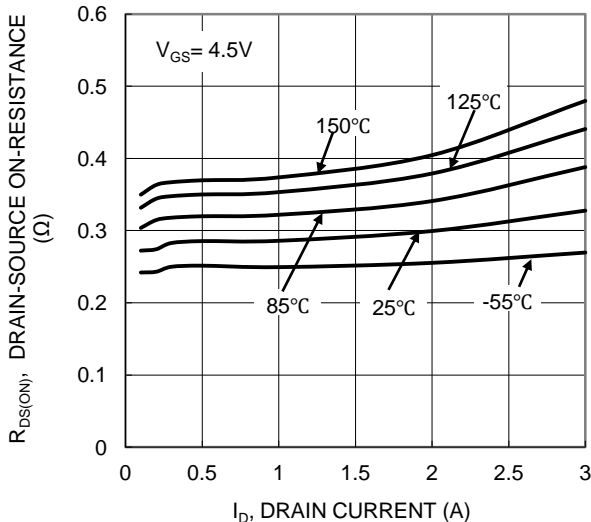


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

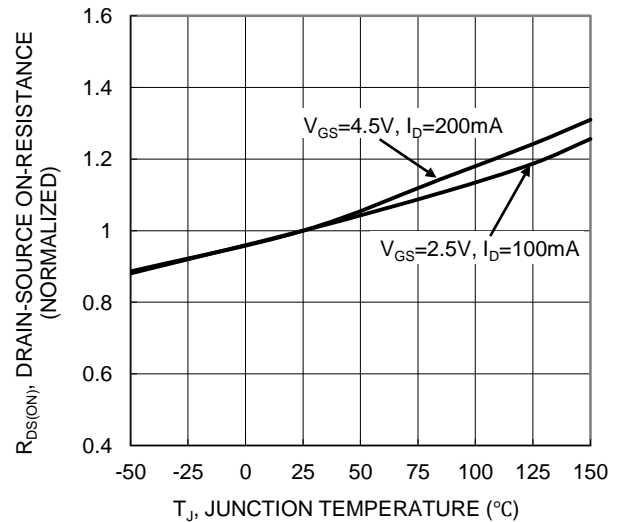


Figure 6. On-Resistance Variation with Temperature

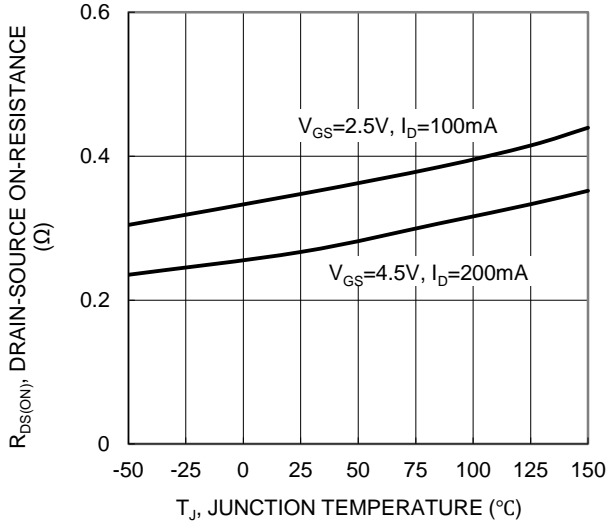


Figure 7. On-Resistance Variation with Temperature

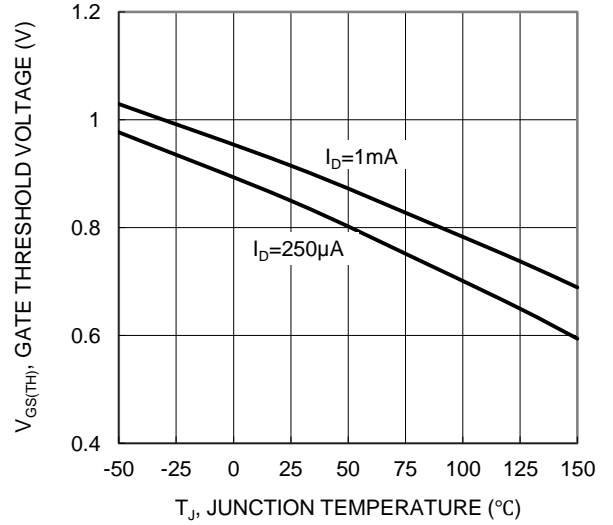


Figure 8. Gate Threshold Variation vs. Junction Temperature

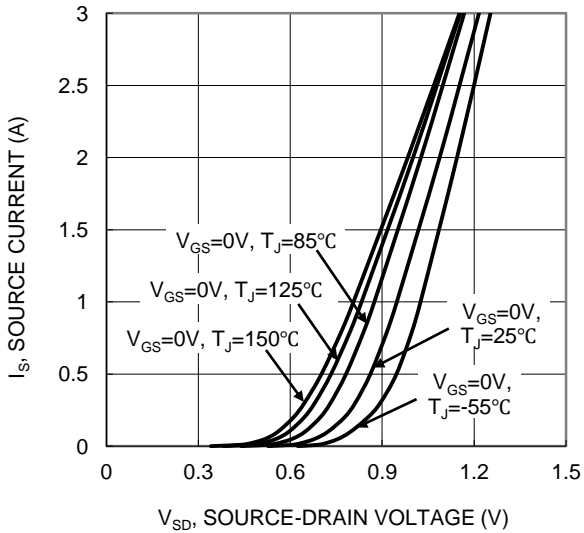


Figure 9. Diode Forward Voltage vs. Current

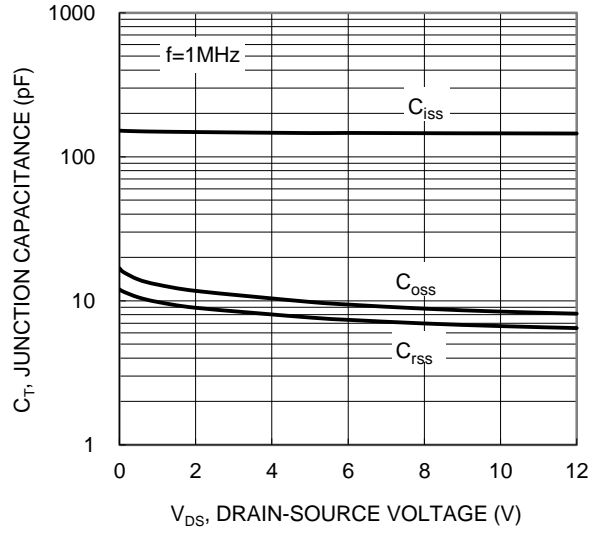


Figure 10. Typical Junction Capacitance

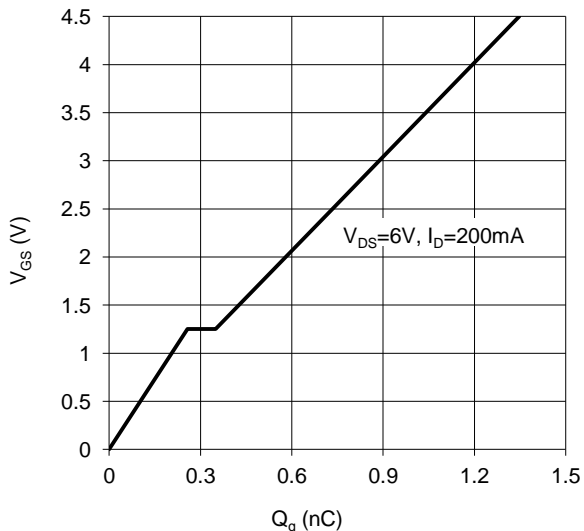


Figure 11. Gate Charge

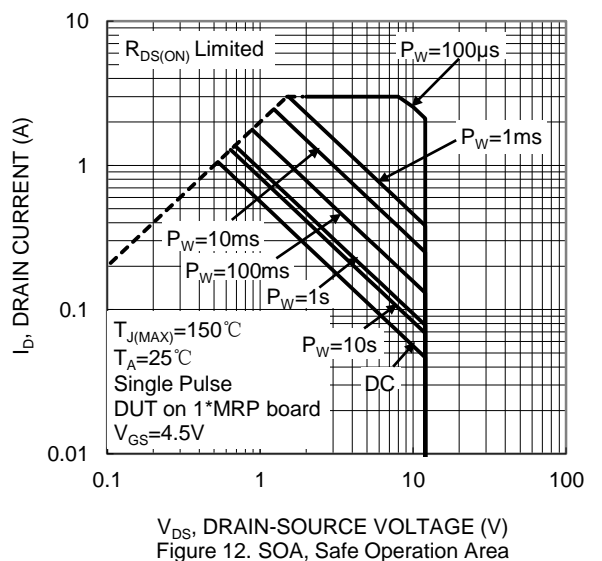


Figure 12. SOA, Safe Operation Area

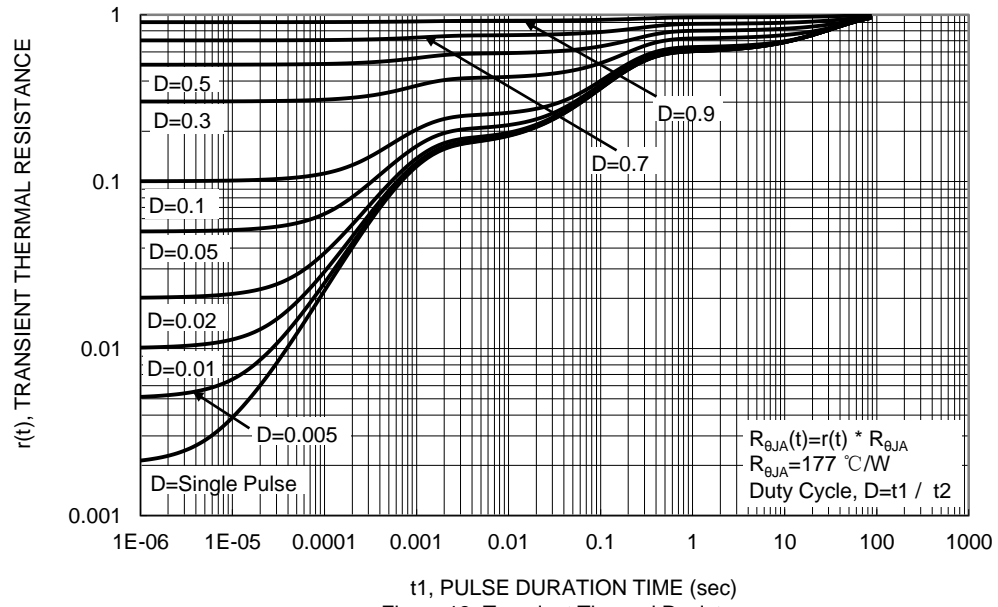
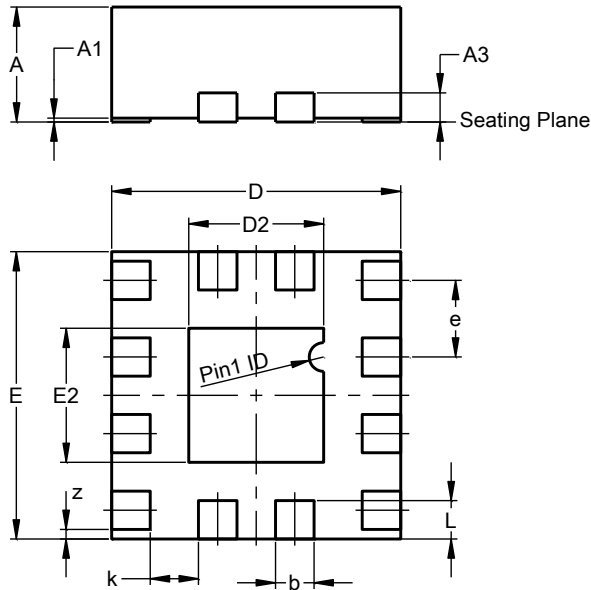


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**U-QFN1515-12**

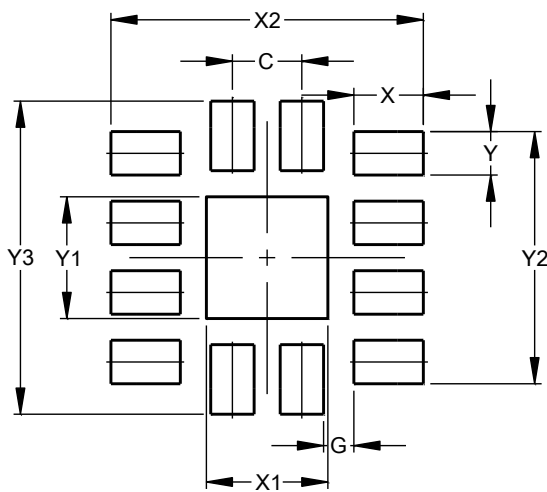


U-QFN1515-12			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0.00	0.05	0.02
A3	0.152 BSC		
b	0.15	0.25	0.20
D	1.45	1.55	1.50
D2	0.60	0.80	0.70
E	1.45	1.55	1.50
E2	0.60	0.80	0.70
e	0.40 BSC		
L	0.15	0.25	0.20
k	--	--	0.25
z	--	--	0.050
All Dimensions in mm			

**Suggested Pad Layout**

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

**U-QFN1515-12**



Dimensions	Value (in mm)
C	0.400
G	0.175
X	0.400
X1	0.700
X2	1.800
Y	0.250
Y1	0.700
Y2	1.450
Y3	1.800

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