

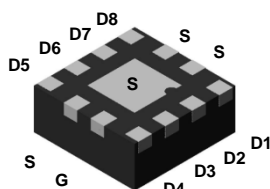
Features

- Low Gate Charge
- $R_{DS(ON)}$: 280m Ω @ $V_{GS} = 4.5V$ (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**

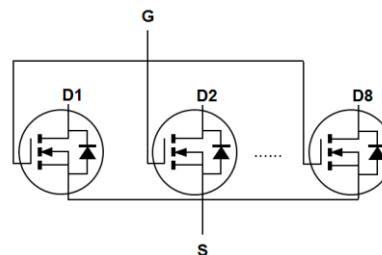
Mechanical Data

- 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

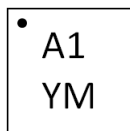
Ordering Information (Note 4)

| 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 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_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|-----------------------------------|------------------|-------|------|
| Drain-Source Voltage | V _{DSS} | 12 | V |
| Gate-Source Voltage | V _{GSS} | ±8 | V |
| Drain Current (Note 6) Continuous | I _D | 2.0 | A |
| | | 1.6 | |
| Pulsed Drain Current (Note 7) | I _{DM} | 10 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5) | P _D | 0.66 | W |
| Total Power Dissipation (Note 6) | P _D | 1.25 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 177 | °C/W |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 100 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -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_A = +25°C, unless otherwise specified.)

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

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

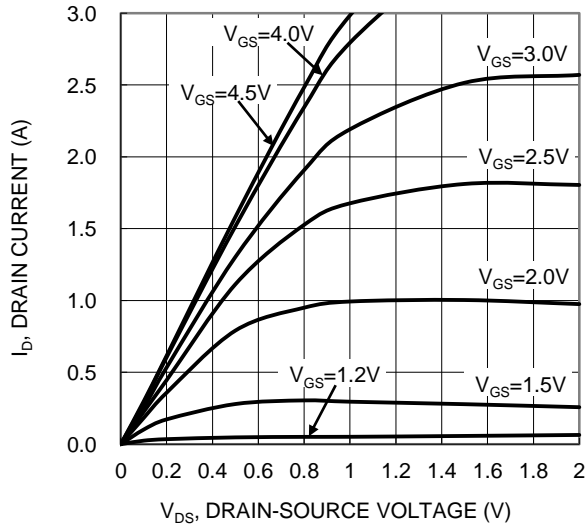


Figure 1. Typical Output Characteristic

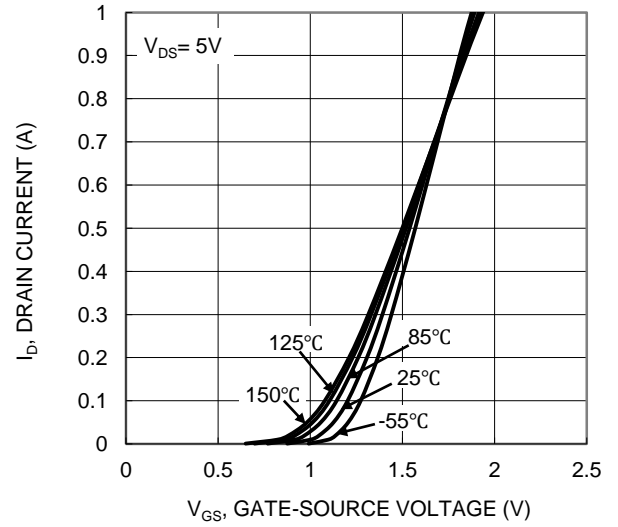


Figure 2. Typical Transfer Characteristic

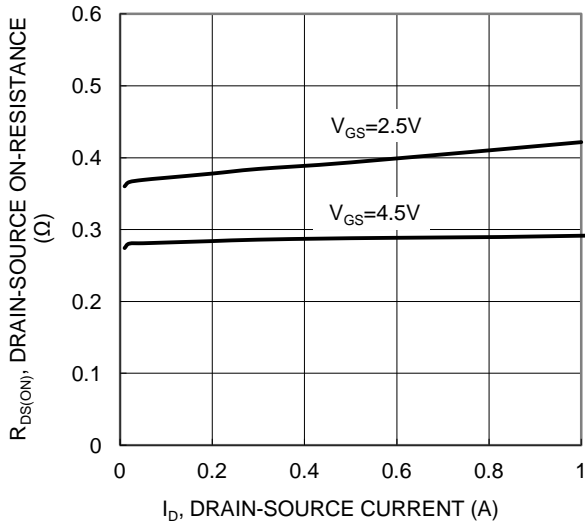


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

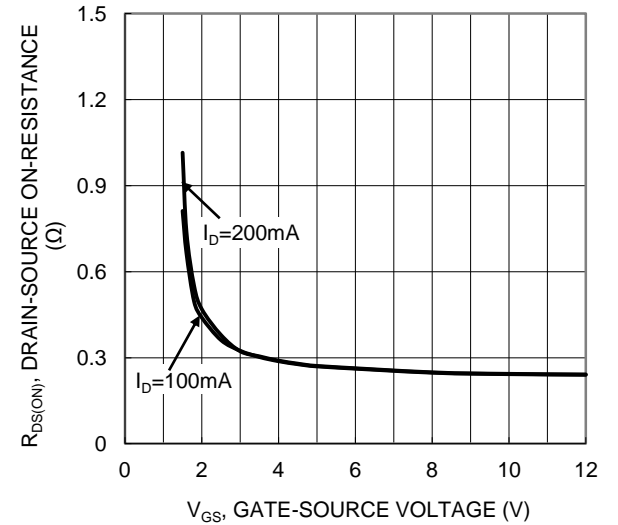


Figure 4. Typical Transfer Characteristic

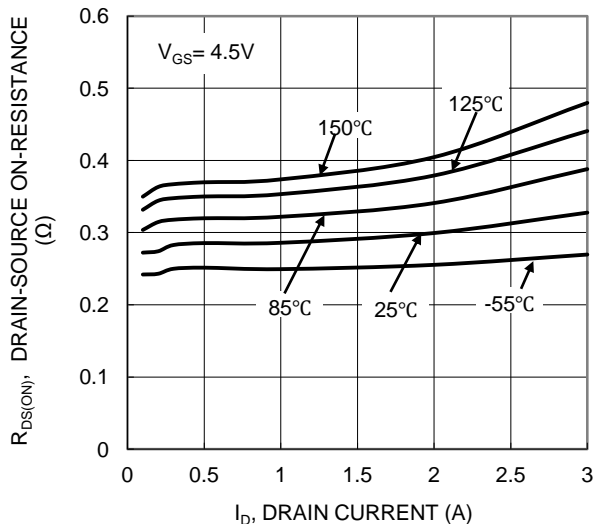


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

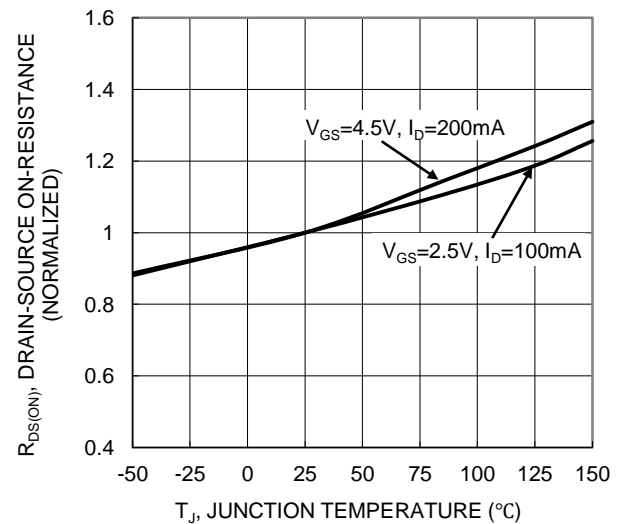
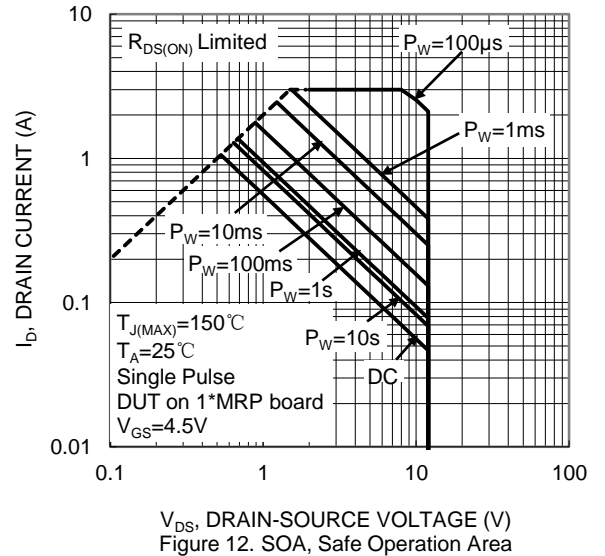
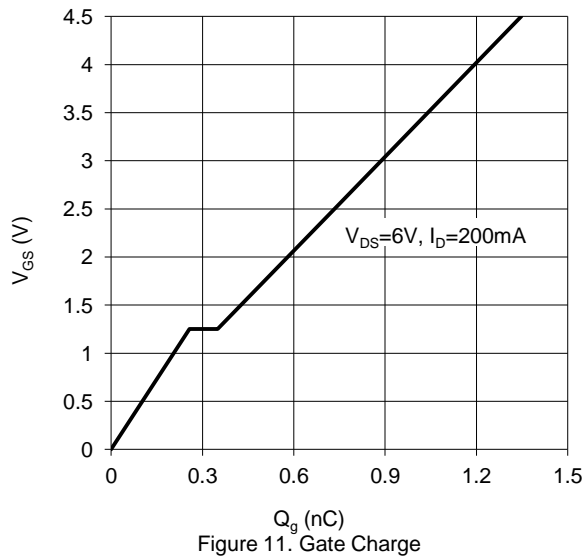
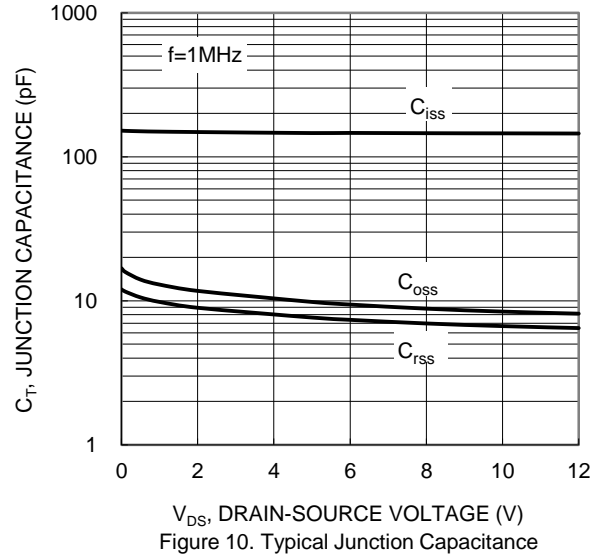
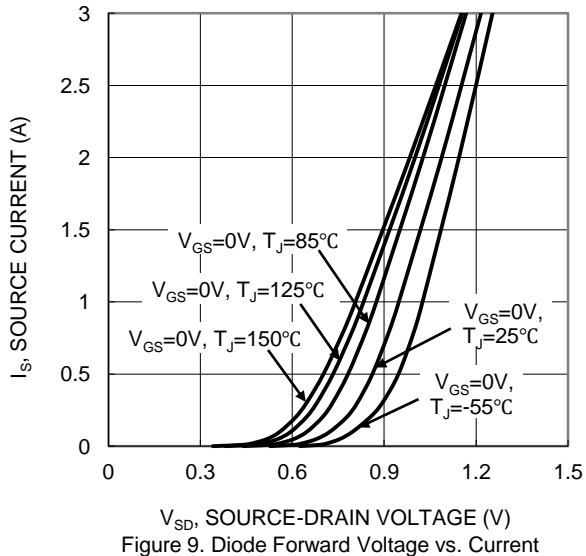
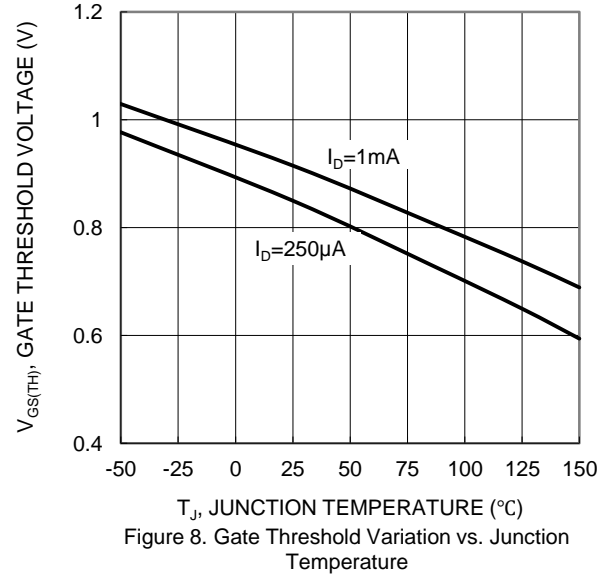
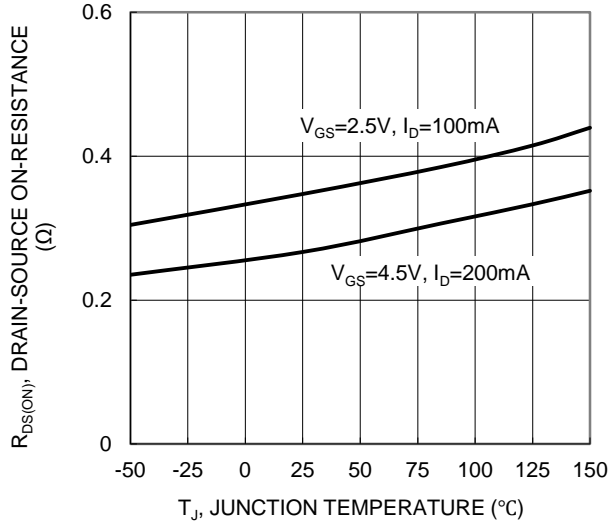


Figure 6. On-Resistance Variation with Temperature



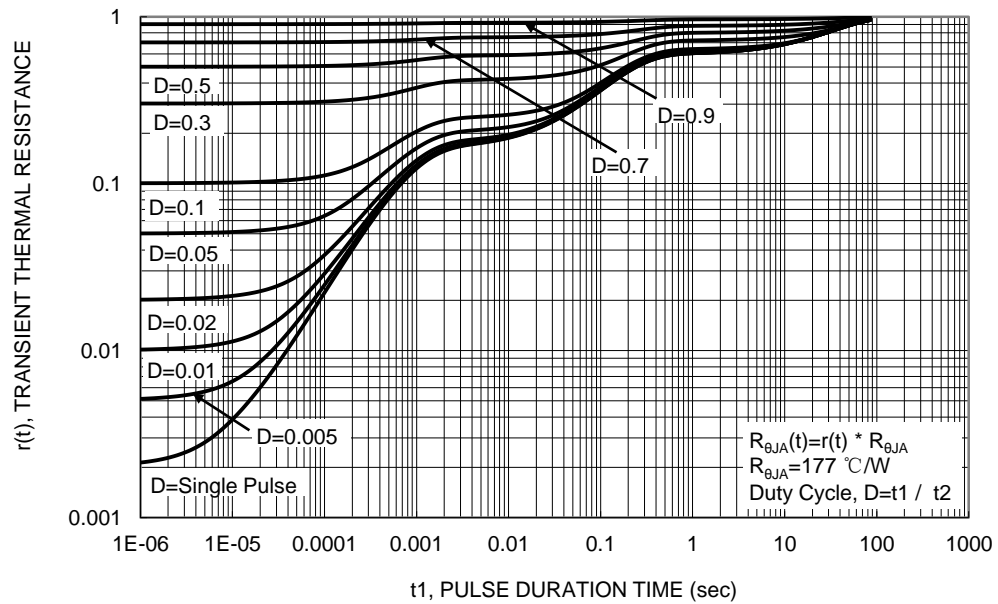
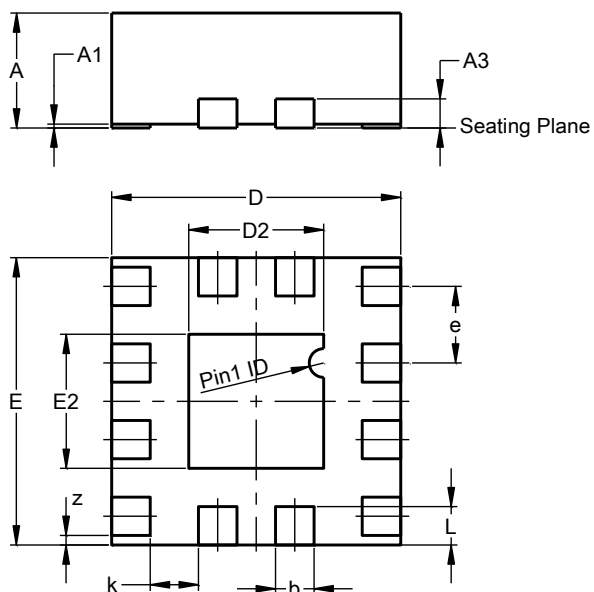


Figure 13. Transient Thermal Resistance

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

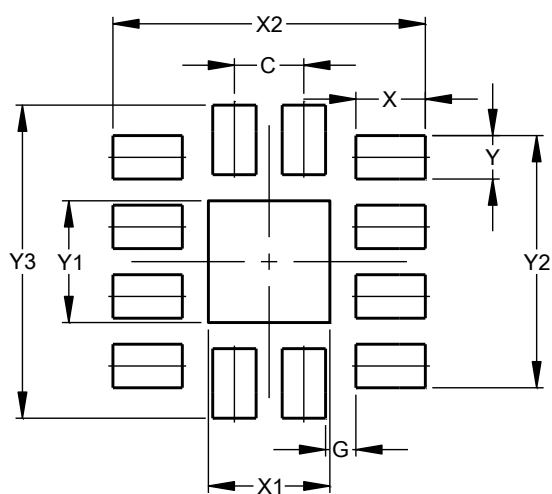
U-QFN1515-12



| 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 | | | |

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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