

Product Summary (@T_A = +25°C)

| | | | |
|----------------------------|--------------------------|-------------------------------|--------------------------------|
| V_{RRM} (V) | I_O (A) | V_{F(MAX)} (V) | I_{R(MAX)} (μA) |
| 600, 1000 | 1 | 1.7 | 5 |

Description and Applications

The US1JDFQ and US1MDFQ are rectifiers packaged in the low profile D-FLAT package. Providing ultra-fast recovery time for high efficiency, this device is ideal for use in applications such as:

- Reverse Protection
- Switching
- Blocking

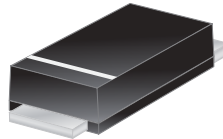
Features and Benefits

- Glass Passivated Die Construction
- Ultra-Fast Recovery Time for High Efficiency
- Surge Overload Rating to 30A Peak
- High Current Capability
- Low Profile Design, Package Height Less than 1.1mm
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

- Case: D-FLAT
- 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 208
- Polarity: Cathode Band
- Weight: 0.035 grams (Approximate)

D-FLAT

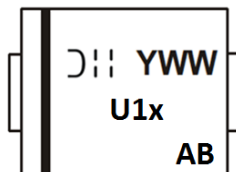


Top View

Ordering Information (Note 5)

| Part Number | Qualification | Case | Packaging |
|-------------|---------------|--------|--------------------|
| US1JDFQ-13 | Automotive | D-FLAT | 10,000/Tape & Reel |
| US1MDFQ-13 | Automotive | D-FLAT | 10,000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information


U1J or U1M = Product Type Marking Code
 ⌋:: = Manufacturers' Code Marking
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 6 for 2016)
 WW = Week Code (01 to 53)
 AB = Foundry and Assembly Code

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

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

| Characteristic | Symbol | US1JDFQ | US1MDFQ | Unit |
|--|---------------------|---------|---------|------|
| Peak Repetitive Reverse Voltage | V _{RRM} | | | |
| Working Peak Reverse Voltage | V _{RWM} | 600 | 1000 | V |
| DC Blocking Voltage | V _R | | | |
| RMS Reverse Voltage | V _{R(RMS)} | 420 | 700 | V |
| Average Rectified Output Current @T _T = +25°C | I _O | | 1.0 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I _{FSM} | | 30 | A |

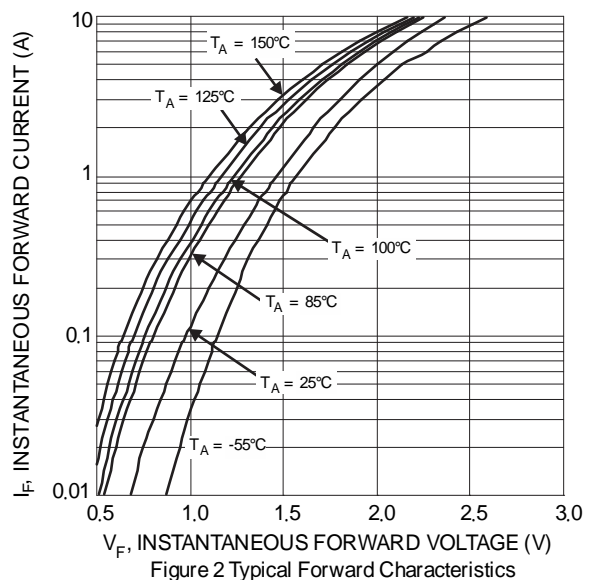
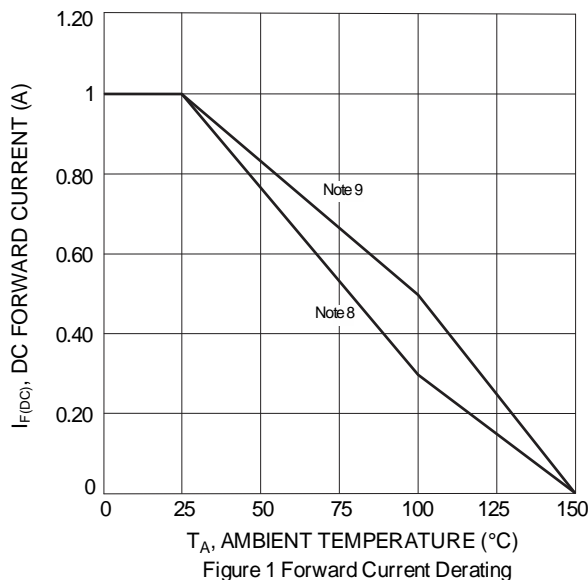
Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Typical Thermal Resistance, Junction to Terminal (Note 8) | R _{θJT} | 44 | °C/W |
| Typical Thermal Resistance, Junction to Ambient (Note 8) | R _{θJA} | 80 | °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 | US1JDFQ | US1MDFQ | Unit |
|--|--------------------|---------|---------|------|
| Minimum Reverse Breakdown Voltage (Note 6) @I _R = 5μA | V _{(BR)R} | 600 | 1000 | V |
| Maximum Forward Voltage Drop @I _F = 1.0A | V _F | | 1.7 | V |
| Peak Reverse Current @T _A = +25°C | I _R | | 5.0 | μA |
| at Rated DC Blocking Voltage (Note 6) @T _A = +100°C | I _R | | 100 | μA |
| Maximum Reverse Recovery Time (Note 7) | t _{RR} | | 75 | ns |
| Typical Total Capacitance (Note 10) | C _T | | 10 | pF |

- Notes:
6. Short duration pulse test used to minimize self-heating effect.
 7. Measured with I_F = 0.5A, I_R = 1.0A, I_{RR} = 0.25A. See Figure 7.
 8. Device mounted on FR-4 substrate, 1" * 1", 2oz, single-sided, PC boards with 0.1" * 0.15" copper pads.
 9. Device mounted on FR-4 substrate, 0.4" * 0.5", 2oz, single-sided, PC boards with 0.2" * 0.25" copper pads.
 10. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.



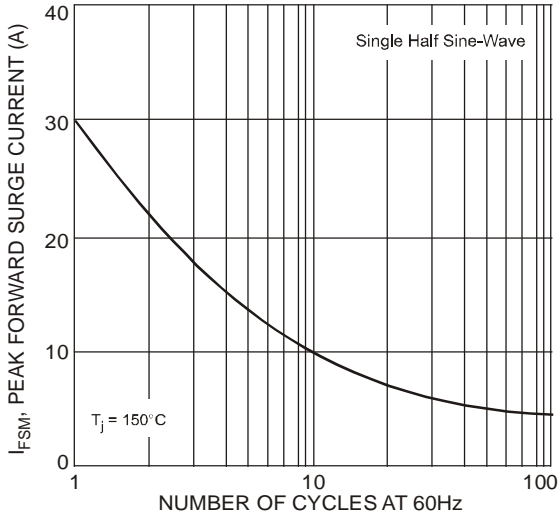


Figure 3 Forward Surge Current Derating Curve

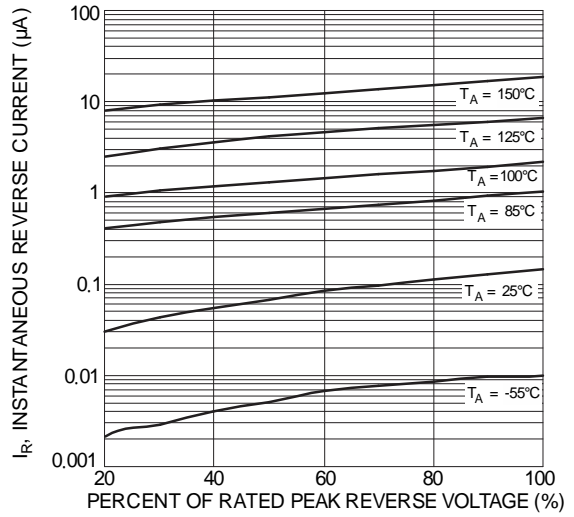


Figure 4 Typical Reverse Characteristics

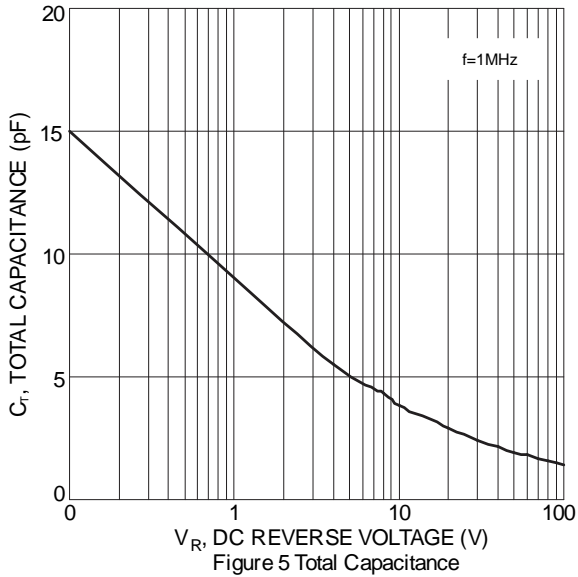


Figure 5 Total Capacitance

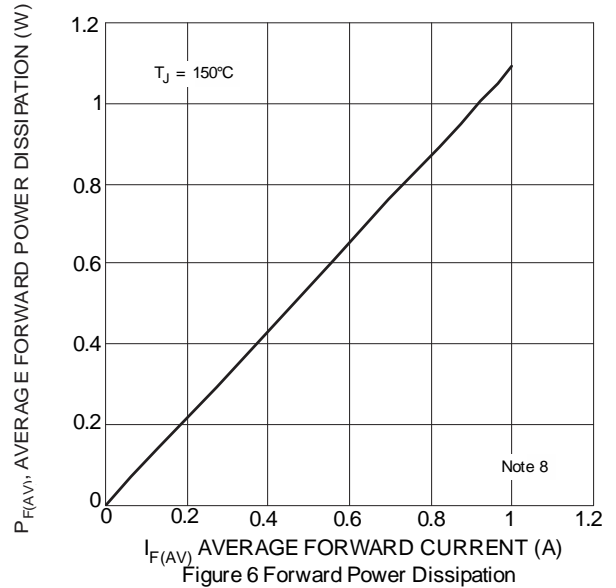
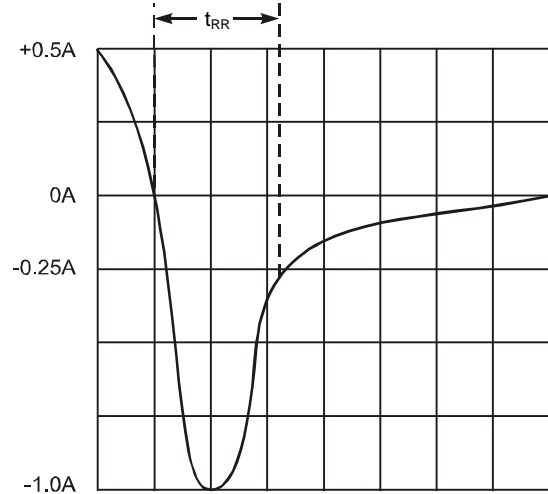
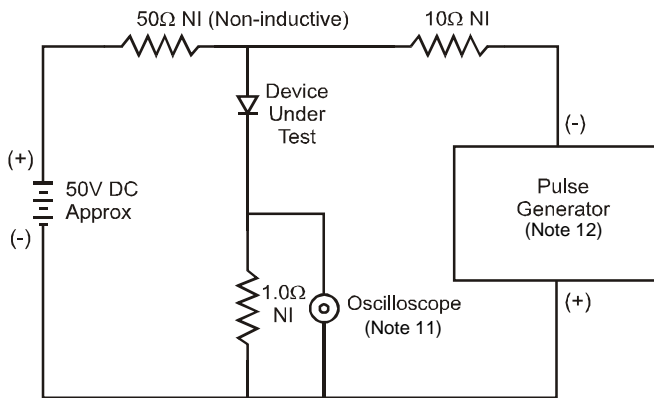


Figure 6 Forward Power Dissipation



Notes:
11. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
12. Rise Time = 10ns max. Input Impedance = 50Ω.

Set time base for 50/100 ns/cm

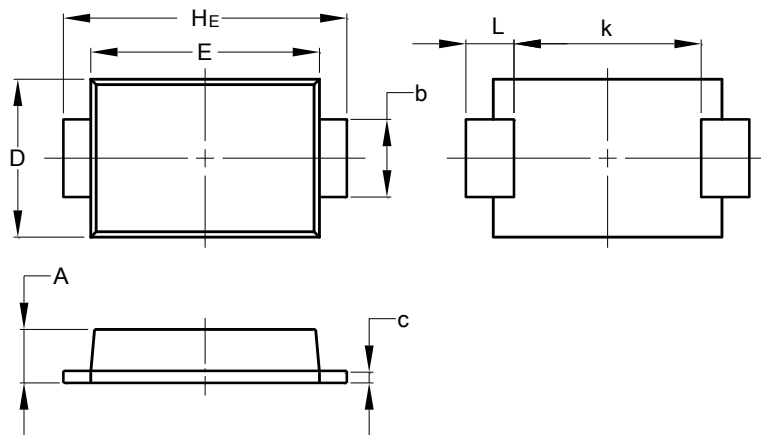
Figure 7 Reverse Recovery Time Characteristic and Test Circuit

NEW PRODUCT

Package Outline Dimensions

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

D-FLAT

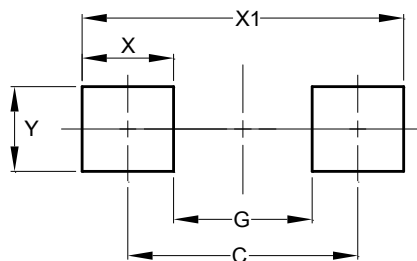


| D-FLAT | | |
|----------------------|------|------|
| Dim | Min | Max |
| A | 0.90 | 1.10 |
| b | 1.25 | 1.65 |
| c | 0.10 | 0.40 |
| D | 2.25 | 2.95 |
| E | 3.95 | 4.60 |
| k | 2.80 | - |
| HE | 5.00 | 5.60 |
| L | 0.50 | 1.30 |
| All Dimensions in mm | | |

Suggested Pad Layout

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

D-FLAT



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 4.65 |
| G | 2.80 |
| X | 1.85 |
| X1 | 6.50 |
| Y | 1.70 |

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