

**Product Summary (@T<sub>A</sub> = +25°C)**

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F(MAX)</sub> (V) | I <sub>R(MAX)</sub> (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

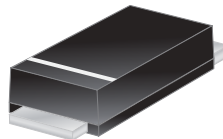
**Features and Benefits**

- 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

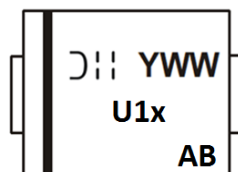


Top View

**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](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](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  
 D = 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<sub>A</sub> = +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 <sub>RRM</sub>    | 600     | 1000    | V    |
| Working Peak Reverse Voltage                             | V <sub>RWM</sub>    |         |         |      |
| DC Blocking Voltage                                      | V <sub>R</sub>      |         |         |      |
| RMS Reverse Voltage                                      | V <sub>R(RMS)</sub> | 420     | 700     | V    |
| Average Rectified Output Current @T <sub>T</sub> = +25°C | I <sub>O</sub>      | 1.0     |         | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms          | I <sub>FSM</sub>    | 30      |         | A    |
| Single Half Sine-Wave Superimposed on Rated Load         |                     |         |         |      |

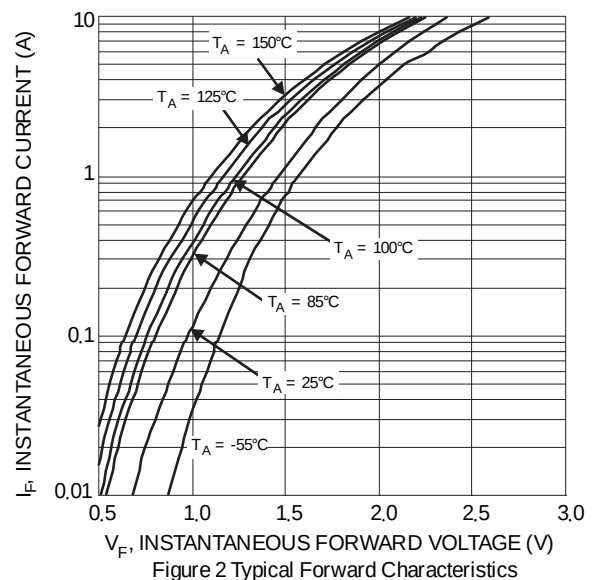
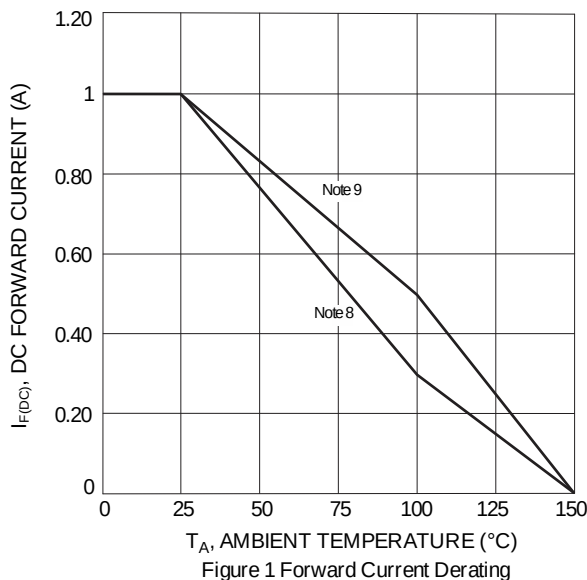
**Thermal Characteristics**

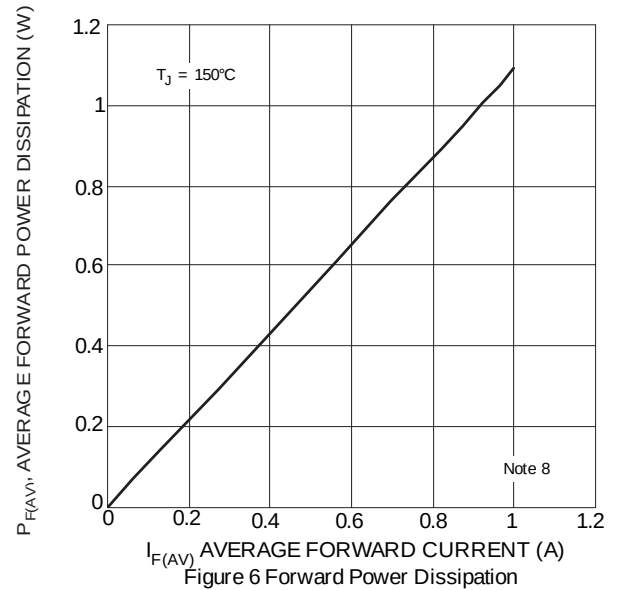
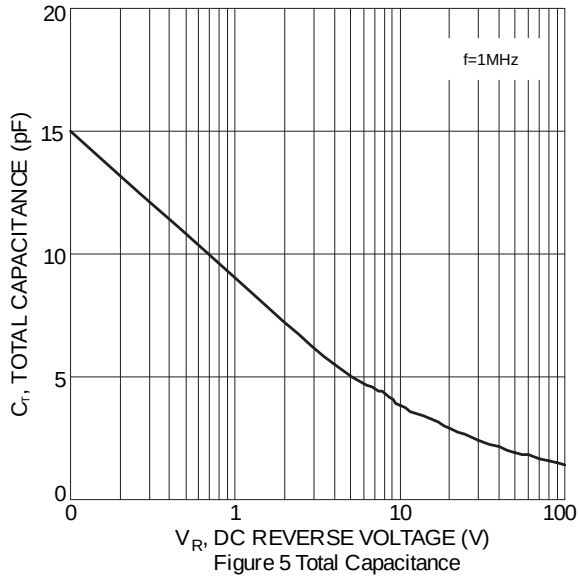
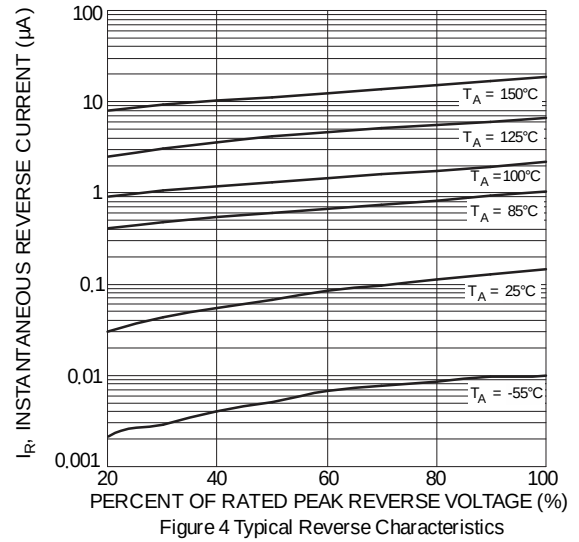
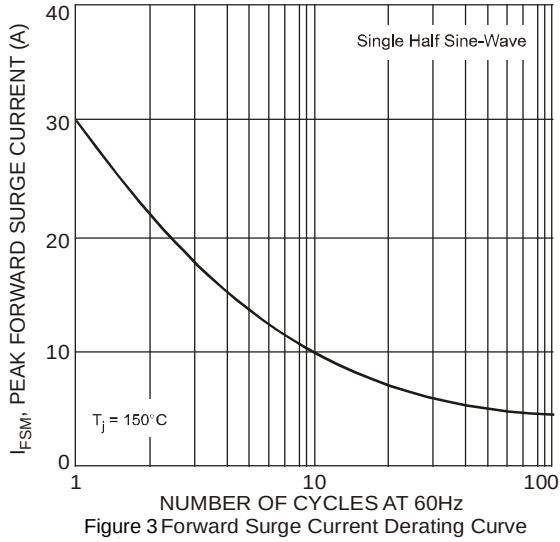
| Characteristic                                            | Symbol                            | Value       | Unit |
|-----------------------------------------------------------|-----------------------------------|-------------|------|
| Typical Thermal Resistance, Junction to Terminal (Note 8) | R <sub>θJT</sub>                  | 44          | °C/W |
| Typical Thermal Resistance, Junction to Ambient (Note 8)  | R <sub>θJA</sub>                  | 80          | °C/W |
| Operating and Storage Temperature Range                   | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

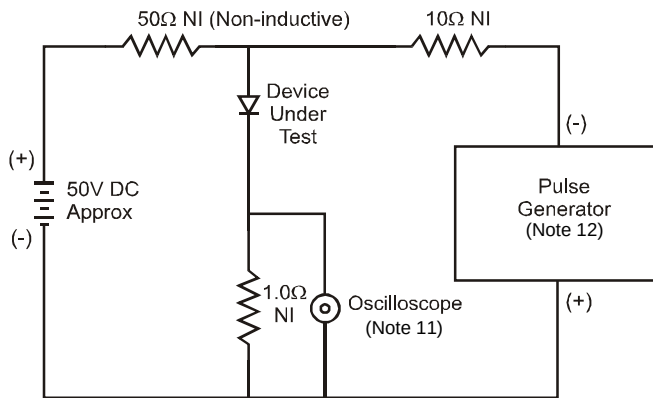
**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                                   | Symbol             | US1JDFQ | US1MDFQ | Unit |
|------------------------------------------------------------------|--------------------|---------|---------|------|
| Minimum Reverse Breakdown Voltage (Note 6) @I <sub>R</sub> = 5μA | V <sub>(BR)R</sub> | 600     | 1000    | V    |
| Maximum Forward Voltage Drop @I <sub>F</sub> = 1.0A              | V <sub>F</sub>     | 1.7     |         | V    |
| Peak Reverse Current @T <sub>A</sub> = +25°C                     | I <sub>R</sub>     | 5.0     |         | μA   |
| at Rated DC Blocking Voltage (Note 6) @T <sub>A</sub> = +100°C   |                    | 100     |         |      |
| Maximum Reverse Recovery Time (Note 7)                           | t <sub>RR</sub>    | 75      |         | ns   |
| Typical Total Capacitance (Note 10)                              | C <sub>T</sub>     | 10      |         | pF   |

- Notes:
6. Short duration pulse test used to minimize self-heating effect.
  7. Measured with I<sub>F</sub> = 0.5A, I<sub>R</sub> = 1.0A, I<sub>RR</sub> = 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.



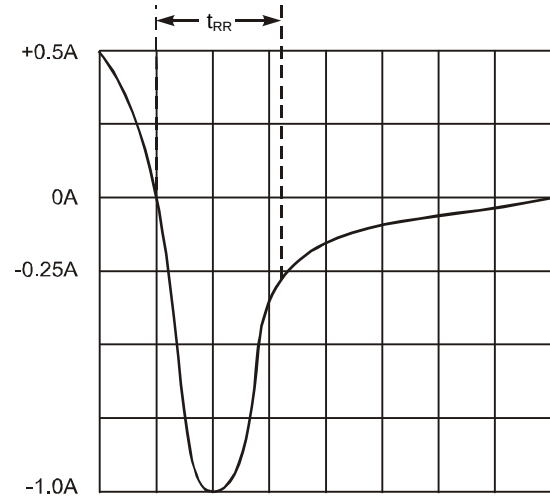




Notes:

11. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.

12. Rise Time = 10ns max. Input Impedance = 50Ω.



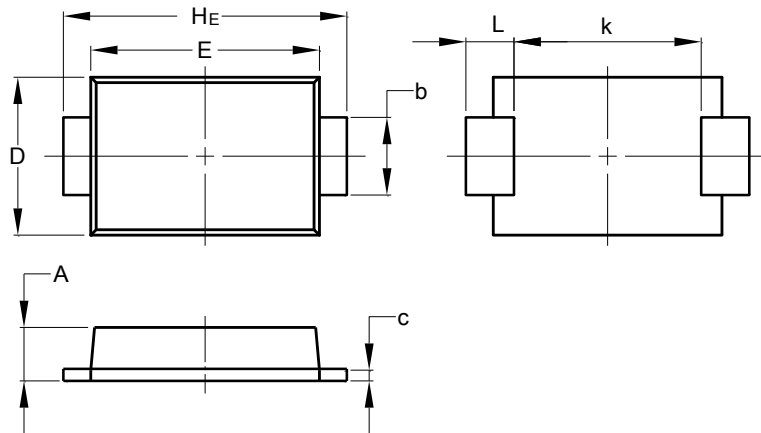
Set time base for 50/100 ns/cm

Figure 7 Reverse Recovery Time Characteristic and Test Circuit

## Package Outline Dimensions

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

### D-FLAT

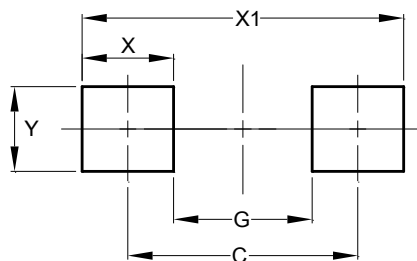


| D-FLAT               |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 0.90 | 1.10 |
| b                    | 1.25 | 1.65 |
| c                    | 0.10 | 0.40 |
| D                    | 2.25 | 2.95 |
| E                    | 3.95 | 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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