

## 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                  | 2                  | 1.7                     | 5                        |

## Description and Applications

The US2JDF is a rectifier packaged in the low profile D-FLAT package. Providing ultra-fast recovery time for high efficiency, this device is ideal for use in general rectification applications such as:

- Switching Mode Power Supplies
- DC-DC Converters

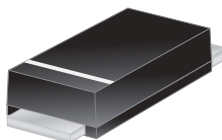
## Features and Benefits

- Glass Passivated Die Construction
- Ultra-Fast Recovery Time for High Efficiency
- Surge Overload Rating to 50A 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)**

## 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 (E3)
- Polarity: Cathode Band
- Weight: 0.064 grams (Approximate)

D-FLAT



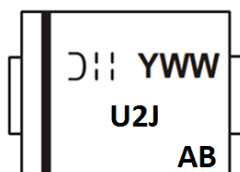
Top View

## Ordering Information (Note 4)

| Part Number | Qualification | Case   | Packaging         |
|-------------|---------------|--------|-------------------|
| US2JDF-13   | Commercial    | D-FLAT | 10000/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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



U2J= Product Type Marking Code  
 DII = Manufacturer's Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 4 for 2014)  
 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 capacitance load, derate current by 20%.

| Characteristic                                            | Symbol              | Value | Unit |
|-----------------------------------------------------------|---------------------|-------|------|
| Peak Repetitive Reverse Voltage                           | V <sub>RRM</sub>    | 600   | V    |
| Working Peak Reverse Voltage                              | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage (Note 5)                              | V <sub>R</sub>      |       |      |
| RMS Reverse Voltage                                       | V <sub>R(RMS)</sub> | 420   | V    |
| Average Rectified Output Current @ T <sub>T</sub> = +75°C | I <sub>O</sub>      | 2.0   | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms           | I <sub>FSM</sub>    | 50    | A    |
| Single Half Sine-Wave Superimposed on Rated Load          |                     |       |      |

## Thermal Characteristics

| Characteristic                                   | Symbol                            | Value       | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Typical Thermal Resistance, Junction to Terminal | R <sub>θJT</sub>                  | 22          | °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             | Value | Unit |
|-------------------------------------------------------------------|--------------------|-------|------|
| Minimum Reverse Breakdown Voltage (Note 5) @ I <sub>R</sub> = 5μA | V <sub>(BR)R</sub> | 600   | 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 5) @ T <sub>A</sub> = +100°C   |                    | 100   |      |
| Maximum Reverse Recovery Time (Note 6)                            | t <sub>rr</sub>    | 75    | ns   |
| Typical Total Capacitance (Note 7)                                | C <sub>T</sub>     | 10    | pF   |

- Notes:
5. Short duration pulse test used to minimize self-heating effect.
  6. Measured with I<sub>F</sub> = 0.5A, I<sub>R</sub> = 1.0A, I<sub>rr</sub> = 0.25A. See Figure 7.
  7. Measured at f=1.0MHz and applied reverse voltage of 4.0V DC.
  8. Device mounted on FR-4 substrate, 1in.\*1in., 2oz, single-sided, PC boards with 0.1in.\*0.15in. copper pads.
  9. Device mounted on FR-4 substrate, 0.4in.\*0.5in., 2oz, single-sided, PC boards with 0.2in.\*0.25in. copper pads.

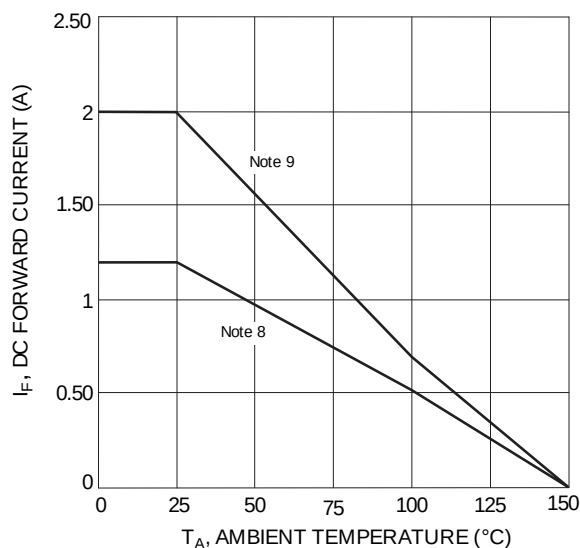


Figure 1 DC Forward Current Derating

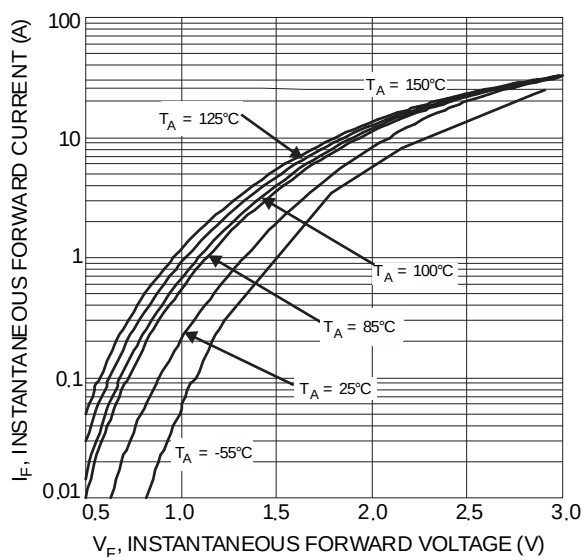


Figure 2 Typical Forward Characteristics

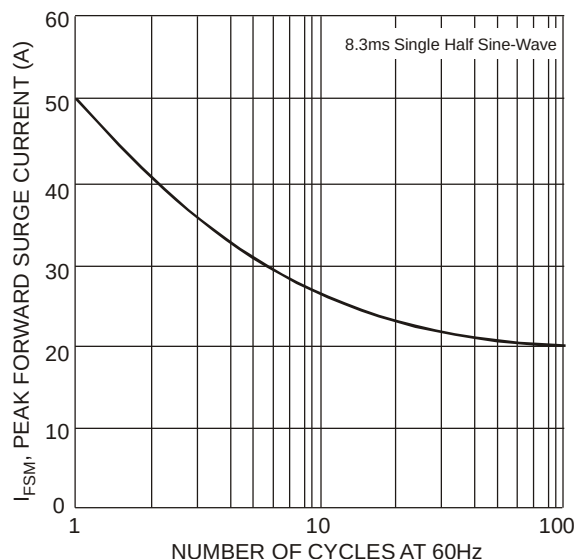


Fig. 3 Maximum Non-Repetitive Surge Current

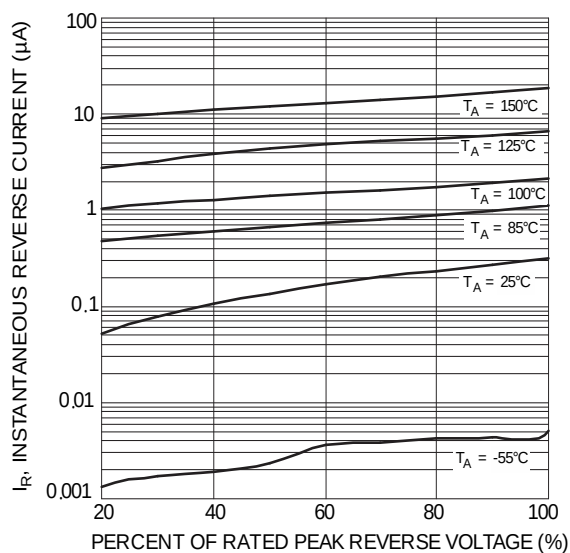


Figure 4 Typical Reverse Characteristics

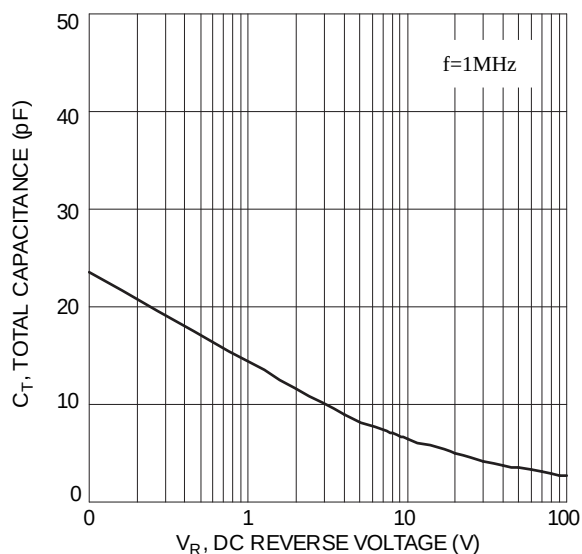


Figure 5 Total Capacitance vs. Reverse Voltage

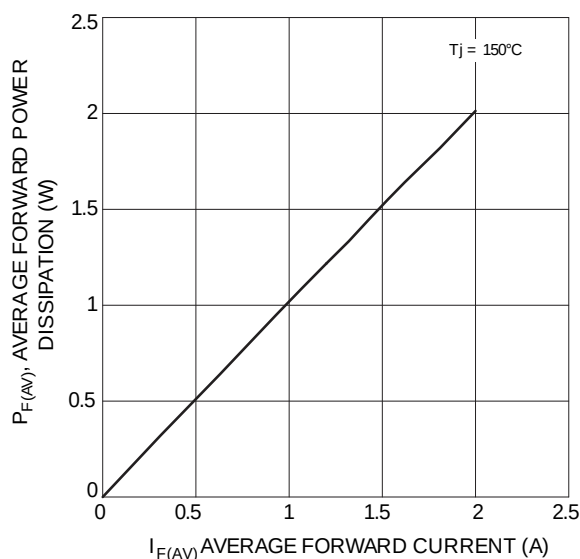
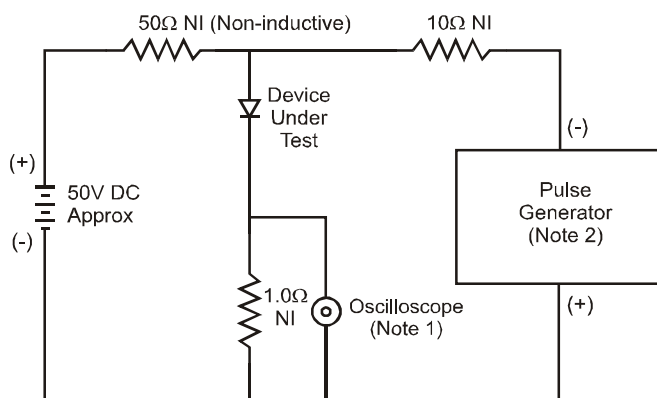
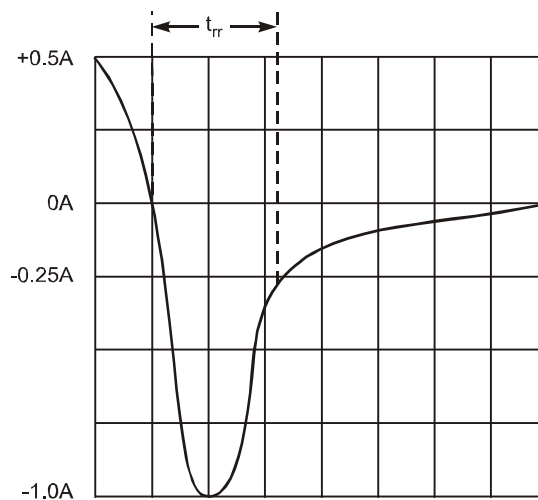


Figure 6 Forward Power Dissipation



- Notes:  
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.  
2. Rise Time = 10ns max. Input Impedance = 50Ω.

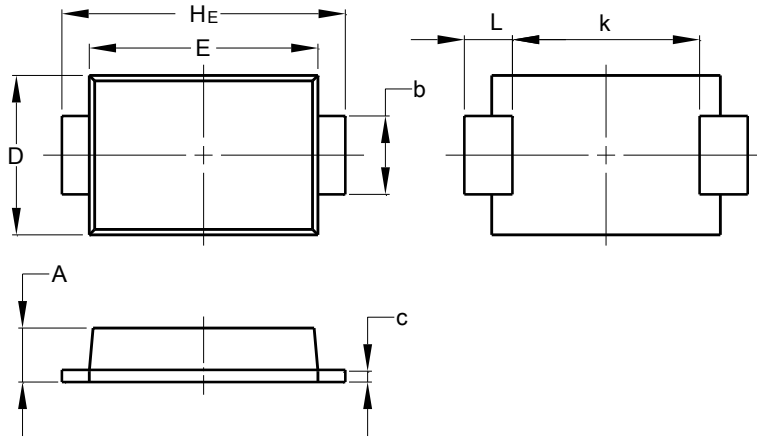


Set time base for 50/100 ns/cm

Fig. 7 Reverse Recovery Time Characteristic and Test Circuit

## Package Outline Dimensions

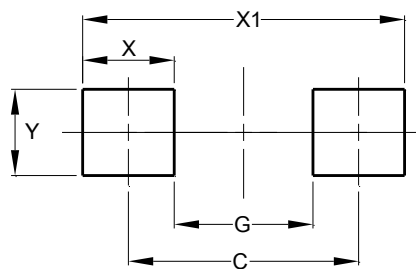
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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



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

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