



# THE DATASHEET OF US2JDF-13



## 2.0A SURFACE MOUNT ULTRA-FAST RECTIFIER

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

V <sub>RRM</sub> (V)	I <sub>o</sub> (A)	V <sub>F</sub> Max (V)	I <sub>R</sub> Max (μA)
600	2	1.7	5

### Description

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.

### Applications

- Switching Mode Power Supplies
- Chargers
- LED lightings
- Inverters
- AC-DC Adapters

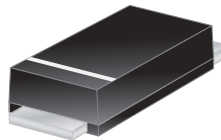
### Features and Benefits

- 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)**
- **Qualified to AEC-Q101 Standard for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([US2JDFQ](#))**

### 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: 0.036 grams (Approximate)

D-FLAT



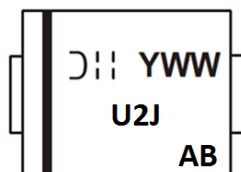
Top View

### Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
US2JDF-13	AEC-Q101	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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

### Marking Information



U2J= Product Type Marking Code  
 U2J = Manufacturer's 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 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>A</sub> = +25°C	I <sub>O</sub>	2.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	50	A

**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> = 2.0A	V <sub>F</sub>	1.7	V
Peak Reverse Current at Rated DC Blocking Voltage (Note 5) @ T <sub>A</sub> = +25°C @ T <sub>A</sub> = +100°C	I <sub>R</sub>	5.0 100	µA
Maximum Reverse Recovery Time (Note 6)	t <sub>rr</sub>	75	ns
Typical Total Capacitance (Note 7)	C <sub>T</sub>	10	pF

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

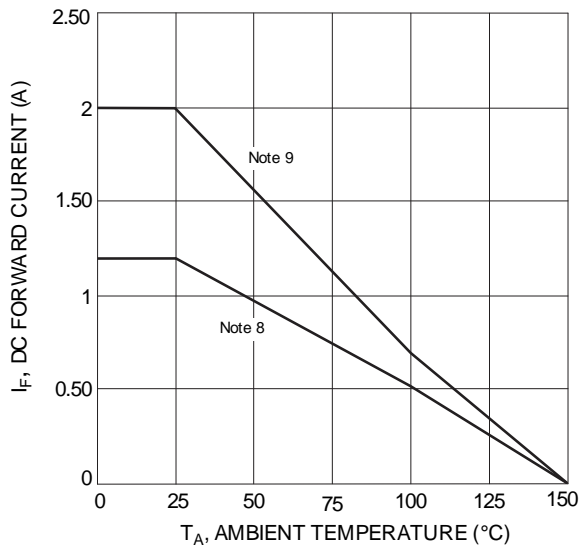


Figure 1 DC Forward Current Derating

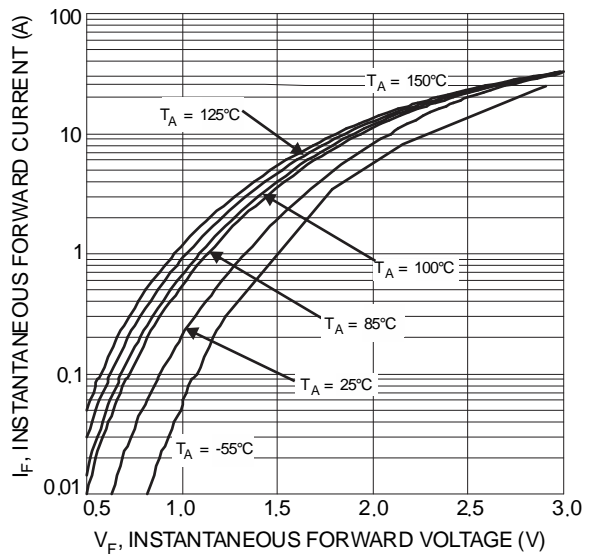


Figure 2 Typical Forward Characteristics

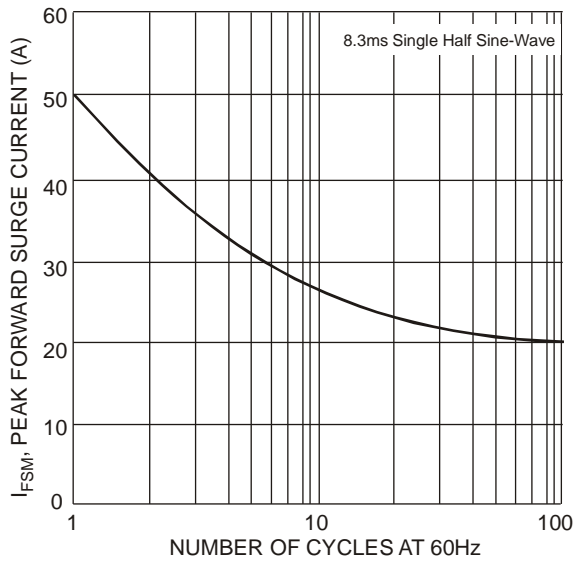


Fig. 3 Maximum Non-Repetitive Surge Current

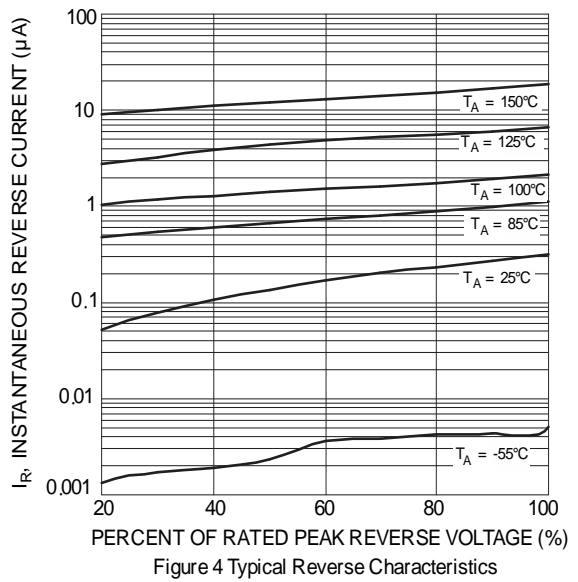


Figure 4 Typical Reverse Characteristics

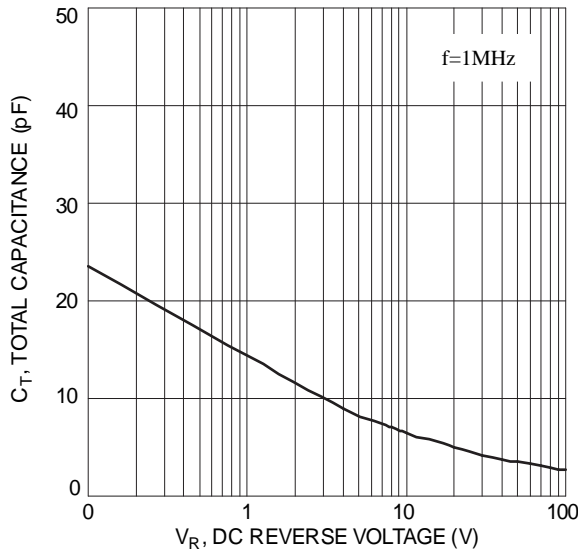


Figure 5 Total Capacitance vs. Reverse Voltage

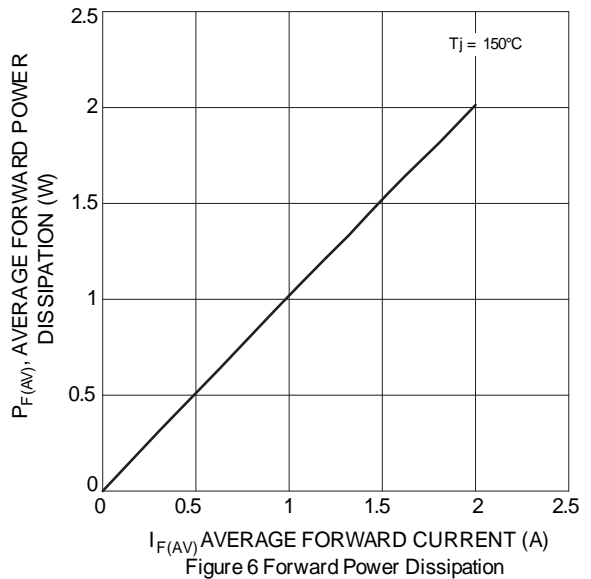
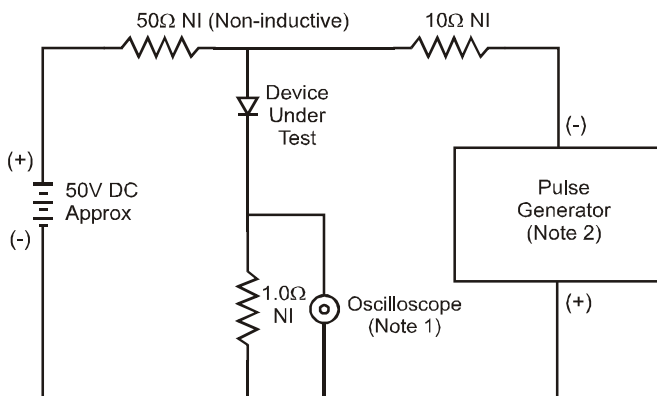
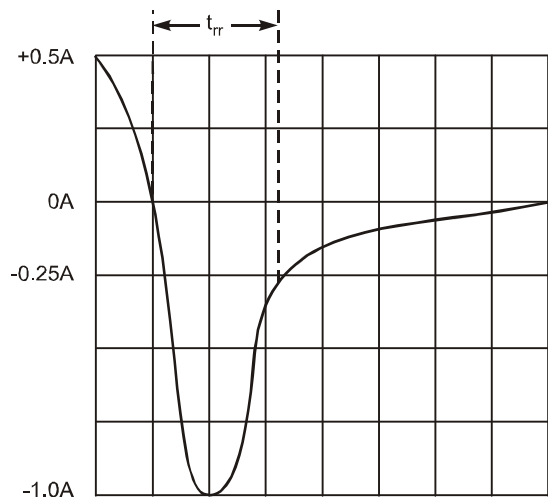


Figure 6 Forward Power Dissipation



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



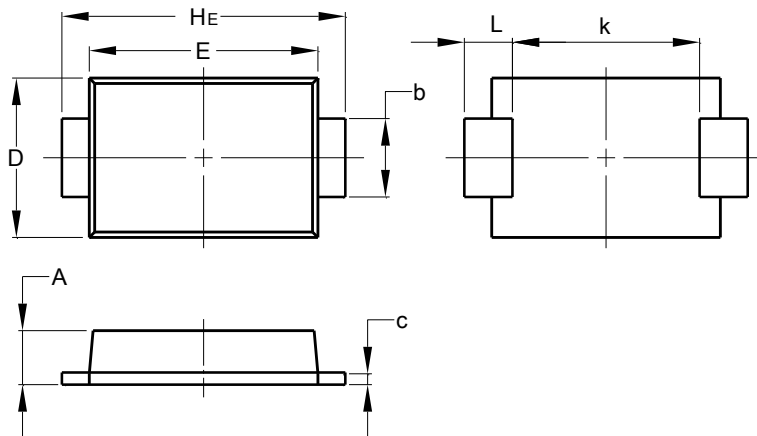
Set time base for 50/100 ns/cm

Fig. 7 Reverse Recovery Time Characteristic and Test Circuit

## Package Outline Dimensions

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

**D-FLAT**

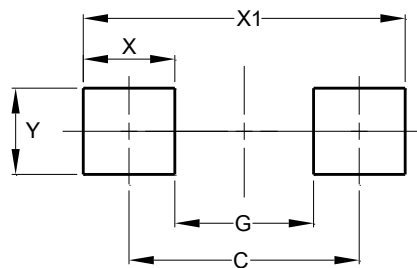


D-FLAT		
Dim	Min	Max
A	0.90	1.10
b	1.25	1.65
c	0.10	0.40
D	2.25	2.95
E	3.95	4.60
k	2.80	—
HE	5.00	5.60
L	0.50	1.30
All Dimensions in mm		

## 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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