THE DATASHEET OF

US1MDF-13

1.0A SURFACE MOUNT ULTRA-FAST RECTIFIER

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

The US1JDF and US1MDF 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 general rectification applications.

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)**

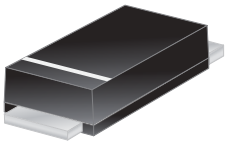
Applications

- Switching Mode Power Supply
- DC-DC Converter

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: 0.035 grams (Approximate)

D-FLAT



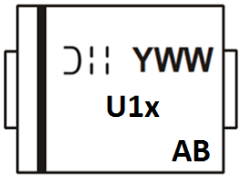
Top View

Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
US1JDF-13	Commercial	D-FLAT	10,000/Tape & Reel
US1MDF-13	Commercial	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. 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 capacitance load, derate current by 20%.

Characteristic	Symbol	US1JDF	US1MDF	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage (Note 5)	V_{RRM} V_{RWM} V_R	600	1,000	V
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)	$R_{\theta JT}$	44	°C/W
Typical Thermal Resistance, Junction to Ambient (Note 8)	$R_{\theta JA}$	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	US1JDF	US1MDF	Unit
Minimum Reverse Breakdown Voltage (Note 5) @I_R = 5μA	$V_{(BR)R}$	600	1,000	V
Maximum Forward Voltage Drop @ I_F = 1.0A	V_F	1.7		V
Peak Reverse Current @T_A = +25°C at Rated DC Blocking Voltage (Note 5) @T_A = +100°C	I_R	5.0 100		μA
Maximum Reverse Recovery Time (Note 6)	t_{RR}	75		ns
Typical Total Capacitance (Note 7)	C_T	10		pF

Notes:
5. Short duration pulse test used to minimize self-heating effect.
6. Measured with I_F = 0.5A, I_R = 1.0A, I_{RR} = 0.25A. See figure 7.
7. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
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.

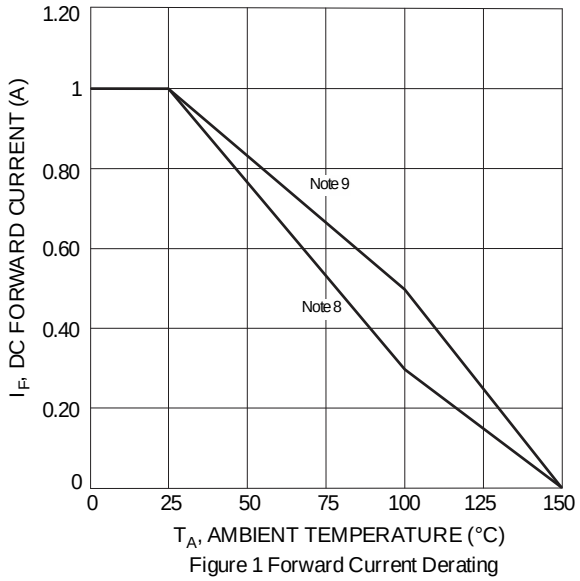


Figure 1 Forward Current Derating

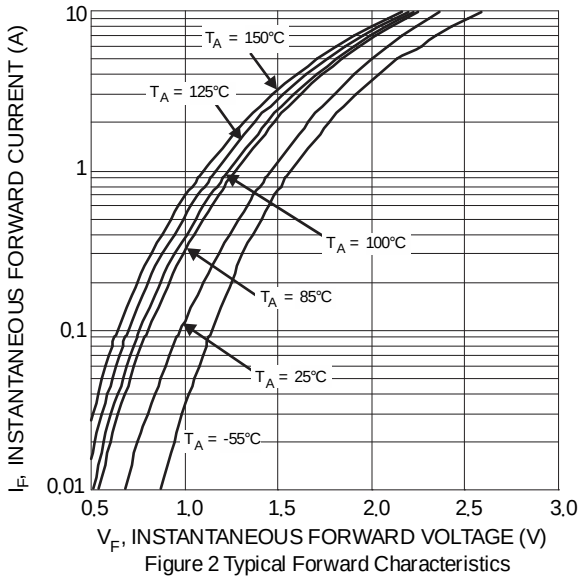


Figure 2 Typical Forward Characteristics

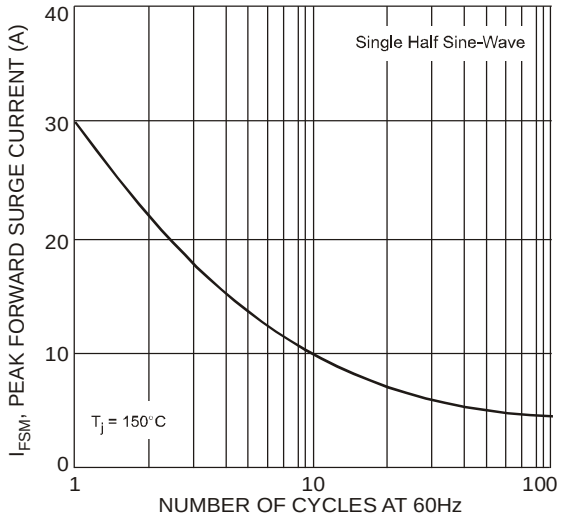


Fig. 3 Forward Surge Current Derating Curve

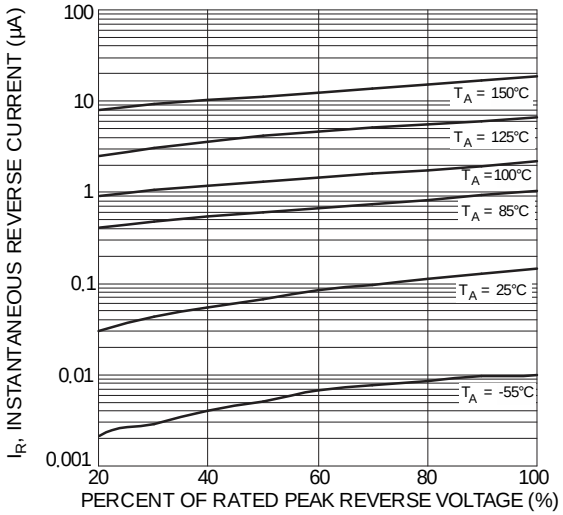


Figure 4 Typical Reverse Characteristics

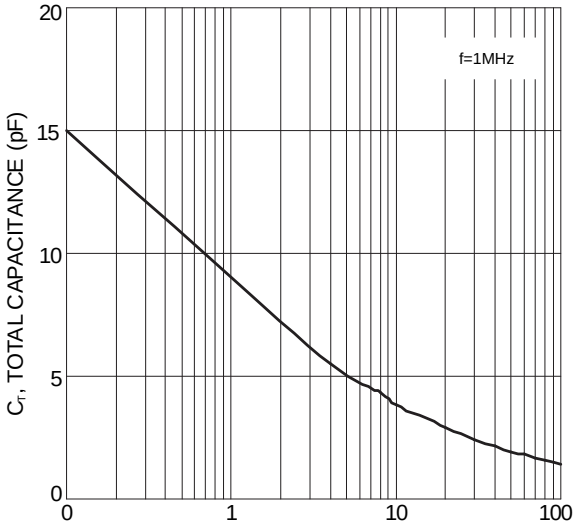


Figure 5 Total Capacitance

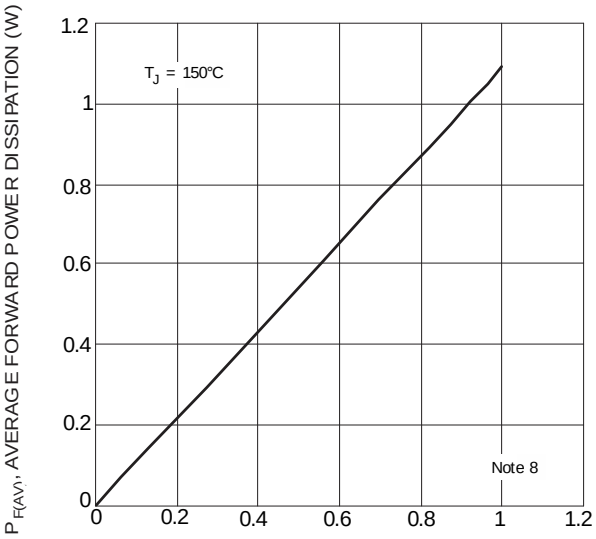
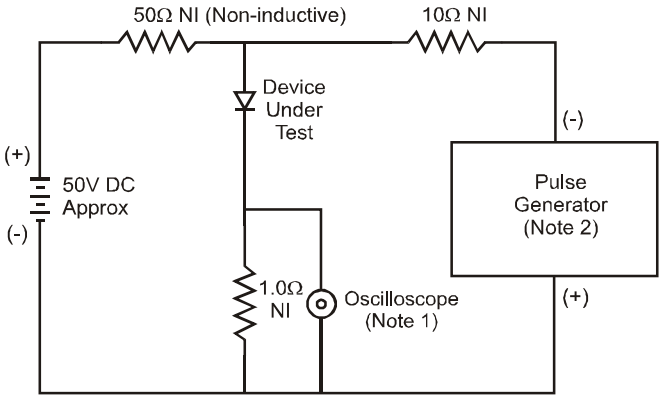


Figure 6 Forward Power Dissipation



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

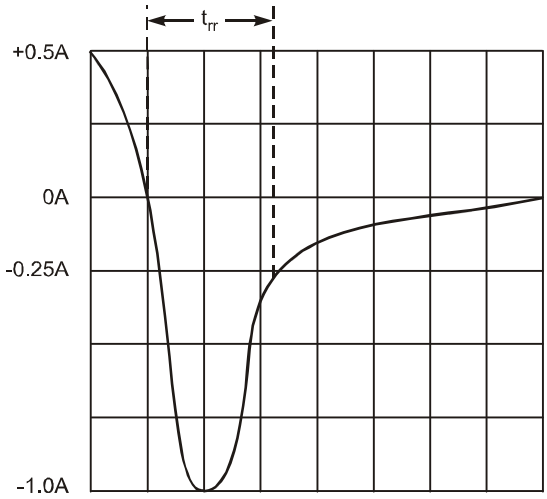
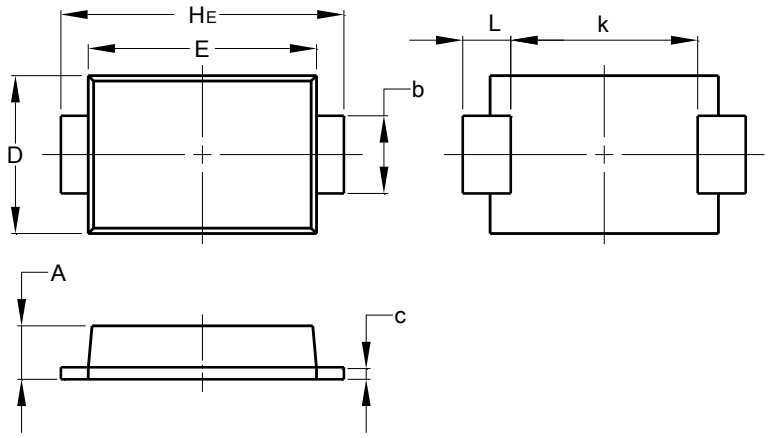


Figure 7 Reverse Recovery Time Characteristic and Test Circuit

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	–
H_E	5.00	5.60
L	0.50	1.30
All Dimensions in mm		

Suggested Pad Layout

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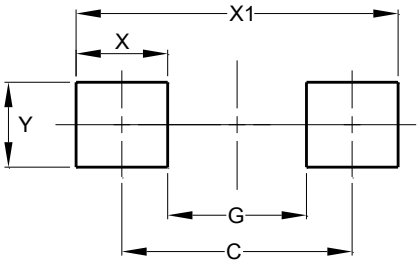
D-FLAT



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

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