

## 1.0A SURFACE MOUNT FAST RECOVERY 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)
1,000	1	1.3	5

### Features and Benefits

- Glass Passivated Die Construction
- 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)**

### Description and Applications

The RS1MDFQ is a rectifier packaged in the low profile D-FLAT package. Providing fast recovery time for high efficiency, this device is ideal for use in general applications such as:

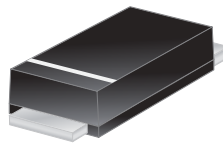
- Reverse Protection
- Switching
- Blocking

### 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)

NEW PRODUCT

D-FLAT



Top View

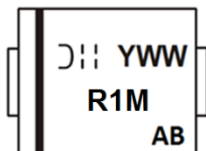
### Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
RS1MDFQ-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

D-FLAT



- R1M = 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<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	Value	Unit
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	1,000	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage (Note 6)	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	700	V
Average Rectified Output Current @ T <sub>A</sub> = +100°C	I <sub>O</sub>	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	30	A

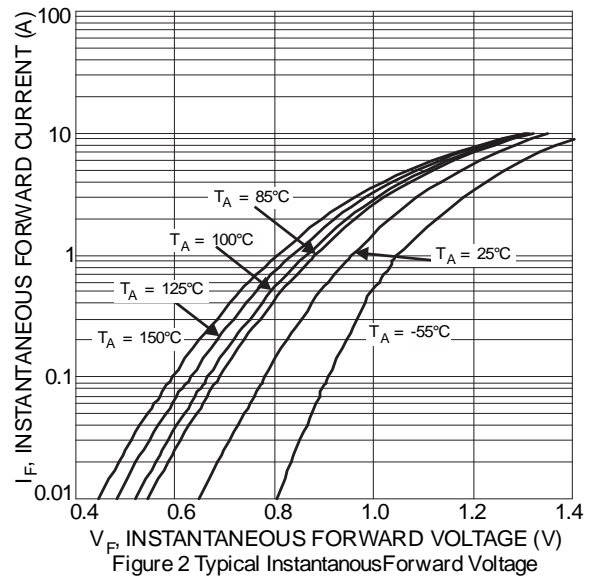
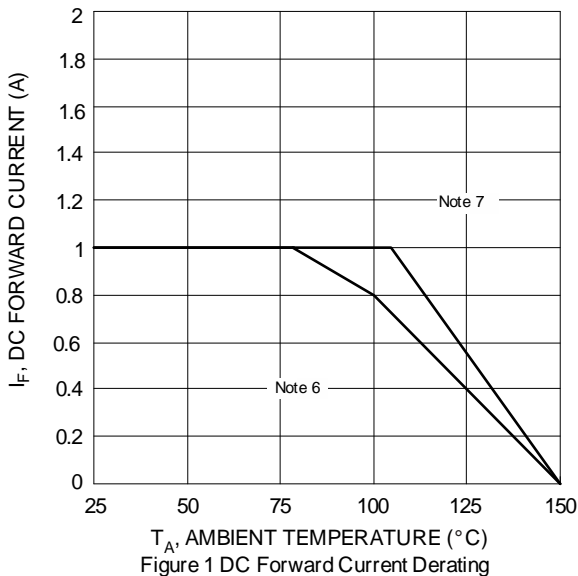
### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Terminal (Note 7)	R <sub>θJT</sub>	31	°C/W
Typical Thermal Resistance, Junction to Air (Note 7)	R <sub>θJA</sub>	83	°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	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	V <sub>(BR)R</sub>	1,000	—	—	V	I <sub>R</sub> = 10μA
Forward Voltage Drop	V <sub>F</sub>	—	0.95 0.83	1.3 —	V	I <sub>F</sub> = 1A, T <sub>J</sub> = +25°C I <sub>F</sub> = 1A, T <sub>J</sub> = +125°C
Leakage Current (Note 8)	I <sub>R</sub>	—	0.2 5	5 —	μA	V <sub>R</sub> = 1,000V, T <sub>J</sub> = +25°C V <sub>R</sub> = 1,000V, T <sub>J</sub> = +125°C
Reverse Recovery Time	t <sub>RR</sub>	—	140	500	ns	I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A, I <sub>RR</sub> = 0.25A
Total Capacitance	C <sub>T</sub>	—	5	—	pF	V <sub>R</sub> = 4.0V <sub>DC</sub> , f = 1MHz

- Notes:
- Device mounted on FR-4 substrate, 1" x 1", 2oz, single-sided, PC boards with 0.1" x 0.15" copper pads.
  - Device mounted on FR-4 substrate, 0.4" x 0.5", 2oz, single-sided, PC boards with 0.2" x 0.25" copper pads.
  - Short duration pulse test used to minimize self-heating effect.



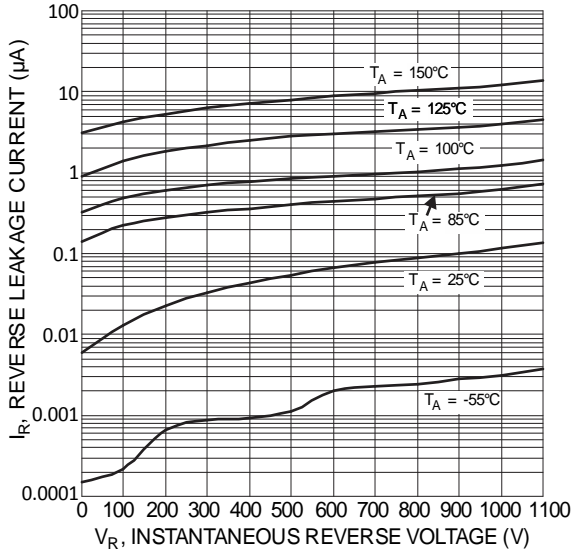


Figure 3 Typical Instantaneous Reverse Characteristics

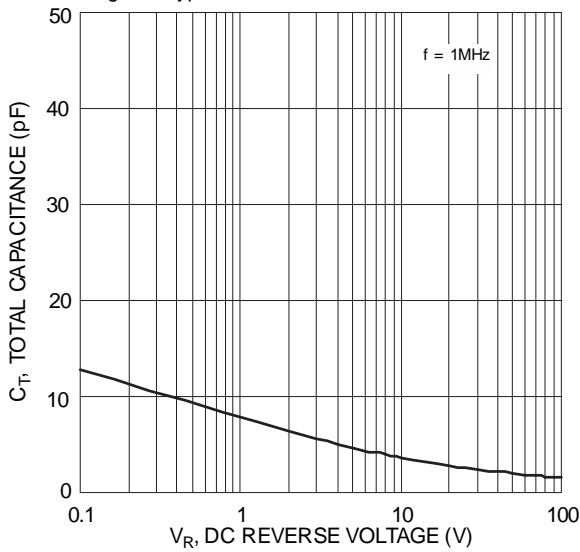


Figure 5 Total Capacitance vs. Reverse Voltage

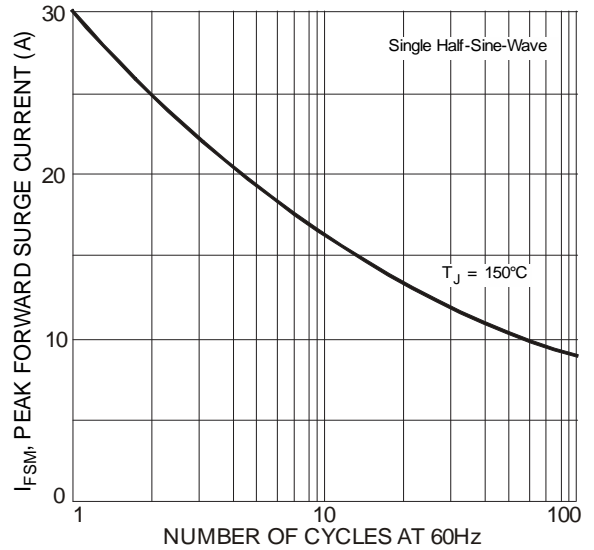


Figure 4: Forward Surge Current Derating Curve

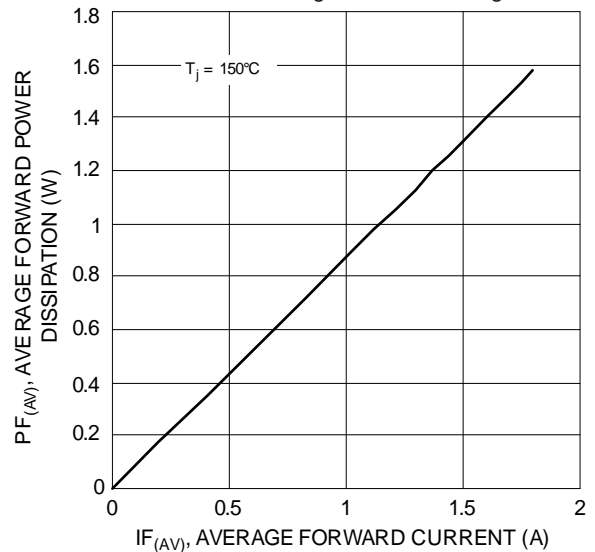
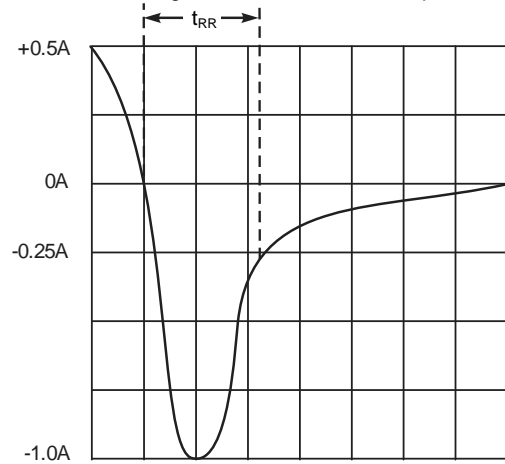
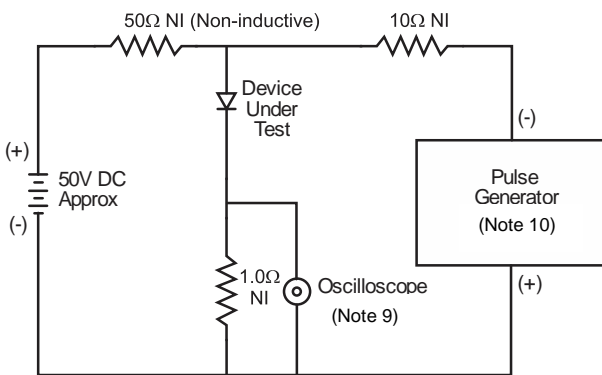


Figure 6 Forward Power Dissipation



Set time base for 50/100 ns/cm

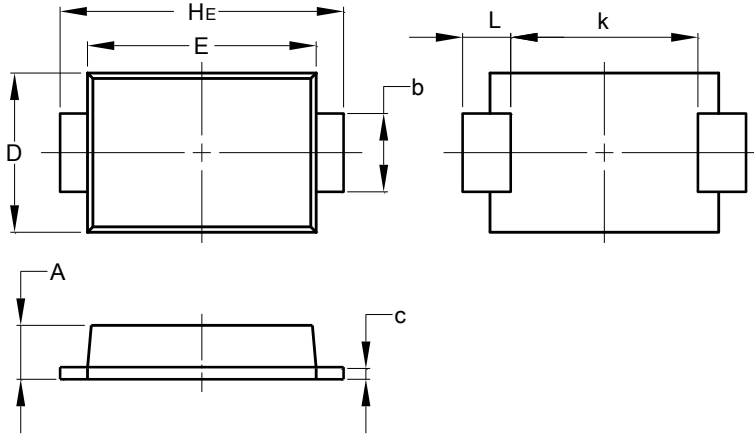
Figure 7 Reverse Recovery Time Characteristic and Test Circuit

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

**Package Outline Dimensions**

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

**D-FLAT**



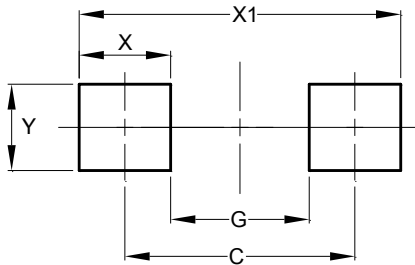
D-FLAT		
Dim	Min	Max
A	0.90	1.10
b	1.25	1.65
c	0.10	0.40
D	2.25	2.95
E	3.95	4.60
k	2.80	-
$H_E$	5.00	5.60
L	0.50	1.30
All Dimensions in mm		

NEW PRODUCT

**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
$X_1$	6.50
Y	1.70

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