

**RS1AF THRU RS1MF**  
FAST RECOVERY RECTIFIERS



|                               |                         |                      |                             |
|-------------------------------|-------------------------|----------------------|-----------------------------|
| <b>VOLTAGE:</b> 50~1000 Volts | <b>CURRENT:</b> 1 Amper | <b>Package:</b> SMAF | <b>Marking And Polarity</b> |
|-------------------------------|-------------------------|----------------------|-----------------------------|

**FEATURES**


- Glass Passivated Chip Junction
- Low Forward Voltage Drop For High Efficiency
- Low Leakage Current For High Reliability
- High Forward Surge Capability For High Reliability

**MECHANICAL DATA**

- **Package:** Molding Compound Meets UL 94 V-0 Flammability Rating, RoHS-Compliant
- **Polarity:** As Marked On Case
- **Mounting Position:** Any
- **Weight:App. 0.026 Grams (0.00091 Ounce)**

**TYPICAL APPLICATIONS**

- General Purpose Use In AC/DC Bridge Full Waverectification For PD,Adapter, Power Supply, Monitor,LED Driver,Printer,Audio Equipment, TV And Homeappliances Etc. Applications.



Remark:

- ①. NH=Niuhan Trademark
- ②. FF=Product Line Code,According To Actual Changes  
YWW=Date Code,According To Actual Changes
- ③. RS1XF=Modle,x=A,B,D,G,J,K,M,
- ④. White band denotes cathode

Single Phase,Half Wave,60Hz,Resistive Or Inductive Load.For Capacitive Load,Derate Current By 20%

**Maximum Ratings (Ta=25°C Unless otherwise specified)**

| Parameter                                 | Test Conditions                                       | Symbol      | RS1 | RS1 | RS1 | RS1 | RS1 | RS1 | RS1  | Unit |
|---|---|-------------|-----|-----|-----|-----|-----|-----|------|------|
|   |   |             | AF  | BF  | DF  | GF  | JF  | KF  | MF   |      |
| Maximum Repetitive Peak Reverse Voltage   |   | $V_{RRM}$   | 50  | 100 | 200 | 400 | 600 | 800 | 1000 | V    |
| Maximum RMS Voltag                        |   | $V_{RMS}$   | 35  | 70  | 140 | 280 | 420 | 560 | 700  | V    |
| Maximum DC Blocking Voltage               |   | $V_{DC}$    | 50  | 100 | 200 | 400 | 600 | 800 | 1000 | V    |
| Maximum Average Forward Rectified Current | @TC= 100 °C   | $I_{F(AV)}$ | 1   |     |     |     |     |     |      | A    |
| Peak Forward Surge Current                | 8.3ms Single Half Sine-wave Superimposed On Rate Load | $I_{FSM}$   | 30  |     |     |     |     |     |      | A    |
| Current Squared Time Per Diode            | t<8.3ms   | $I^2t$      | 3.7 |     |     |     |     |     |      | A    |

**Electrical Characterstcs (Ta=25°C Unless otherwise specified )**

| Parameter  | Test Conditions                    | Symbol    | RS1  | RS1 | RS1 | RS1 | RS1 | RS1 | RS1 | Unit |
|--|------------------------------------|-----------|------|-----|-----|-----|-----|-----|-----|------|
|  |                                    |           | AF   | BF  | DF  | GF  | JF  | KF  | MF  |      |
| Maximum Instaneous forward voltage per diode (note1)             | Ta=25°C                            | $V_F$     | 1.30 |     |     |     |     |     |     | V    |
|  | Ta=125°C                           |           | 1.18 |     |     |     |     |     |     |      |
| Maximum DC Reverse Current at Rated DC Blocking Voltage (Note 1) | Ta=25°C                            | $I_{RRM}$ | 5    |     |     |     |     |     |     | uA   |
|  | Ta=125°C                           |           | 500  |     |     |     |     |     |     |      |
| Typical Junction Capacitance Per Diode                           | 4.0 V, 1MHz                        | $C_J$     | 15   |     |     |     |     |     |     | pF   |
| Maximum Reverse Recovery Time                                    | $I_F=0.5A, I_R=1.0A, I_{RR}=0.25A$ | $T_{RR}$  | 350  |     |     |     |     |     |     | nS   |

**Thermal Characteristics (Ta=25°C Unless otherwise specified )**

| Parameter                            | Symbol          | Ratings |    |     | Unit |
|--------------------------------------|-----------------|---------|----|-----|------|
| Operating Junction Temperature Range | $T_J$           | -55     | to | 150 | °C   |
| Storage Temperature Range            | $T_{STD}$       | -55     | to | 150 |      |
| Typical thermal resistance (Note 2)  | $R_{\theta JA}$ | 100.0   |    |     | °C/W |
|                                      | $R_{\theta JC}$ | 32      |    |     |      |

Notes: 1.Pulse Test: 300 Us Pulse Width,1% Duty Cycle

2.Thermal resistance from junction to lead vertical P.C.B. mounted , 0.375"(9.5mm)lead length

RS1AF THRU RS1MF  
FAST RECOVERY RECTIFIERS



Typical Characteristics Curves

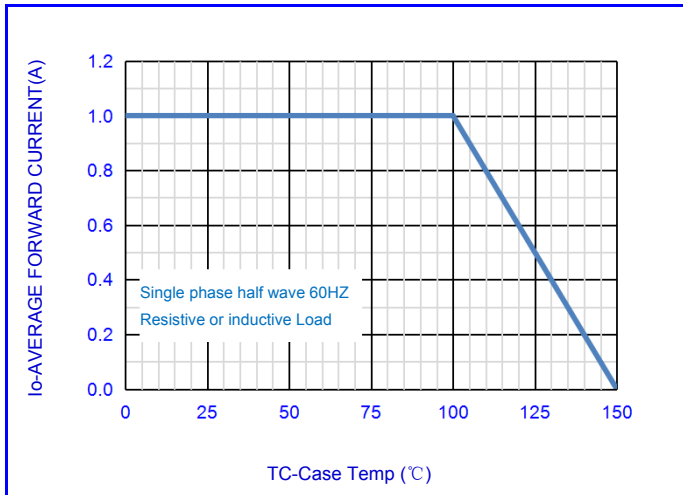


Fig.1-FORWARD CURRENT DERATING CURVE

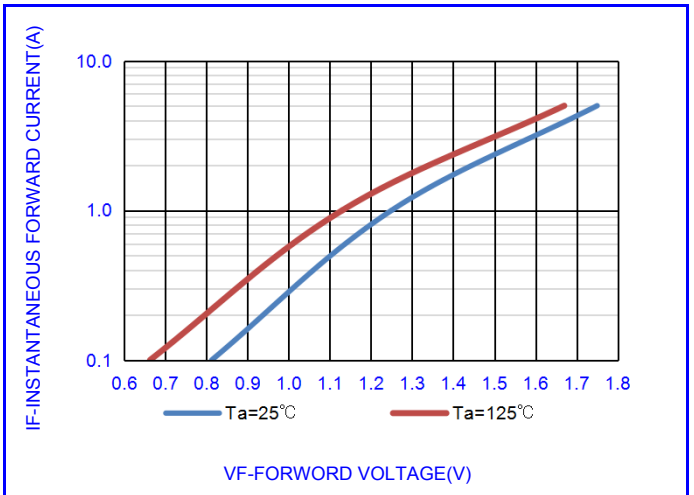


Fig.2- TYPICAL INSTANTANEOUS FORWARD

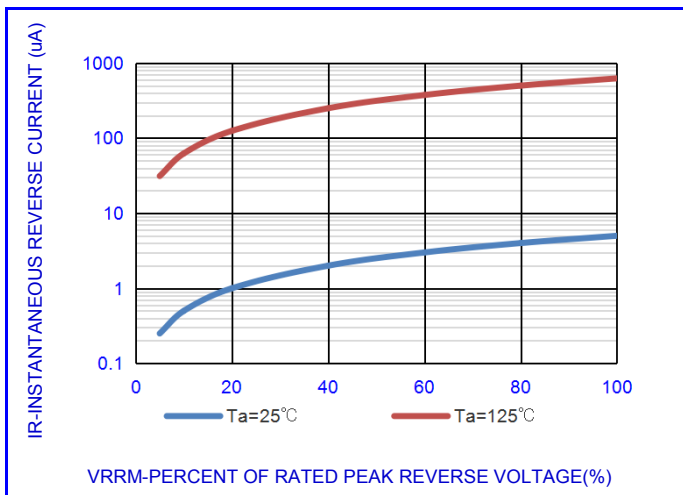


Fig.3- TYPICAL REVERSE CHARACTERISTICS

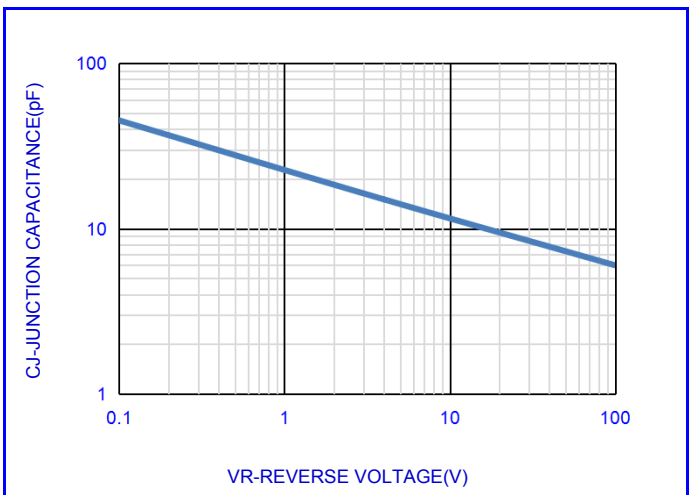


Fig.4- TYPICAL JUNCTION CAPACITANCE

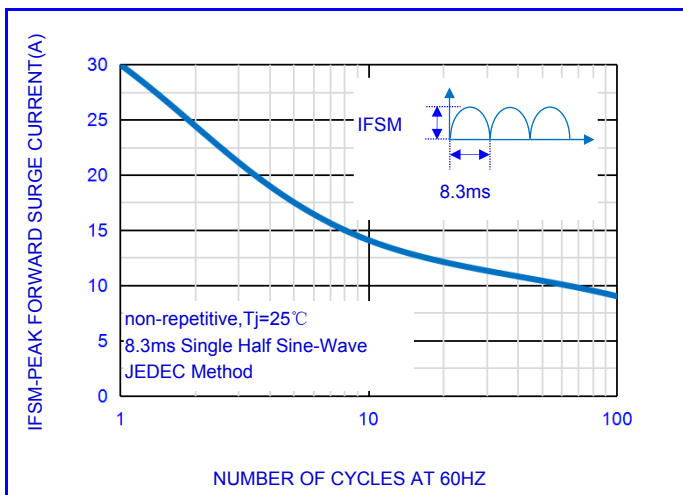


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

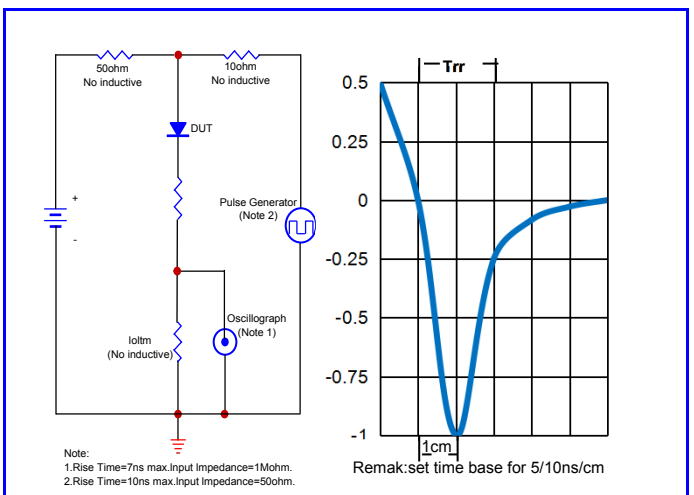


Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

RS1AF THRU RS1MF  
FAST RECOVERY RECTIFIERS



| OUTLINE DRAWINGS |             |             | SMAF                      |             |             |               |
|------------------|-------------|-------------|---------------------------|-------------|-------------|---------------|
|                  |             |             | <b>OUTLINE DIMENSIONS</b> |             |             |               |
|                  |             |             | <b>Milimeters</b>         |             |             | <b>Inches</b> |
| <b>Dim.</b>      | <b>Min.</b> | <b>Typ.</b> | <b>Max.</b>               | <b>Min.</b> | <b>Typ.</b> | <b>Max.</b>   |
| A                | 3.200       | -           | 3.800                     | 0.126       | -           | 0.150         |
| B                | 4.400       | -           | 5.300                     | 0.173       | -           | 0.209         |
| C                | 2.300       | -           | 2.700                     | 0.091       | -           | 0.106         |
| D                | 0.950       | -           | 1.200                     | 0.037       | -           | 0.047         |
| E                | 1.300       | -           | 1.600                     | 0.051       | -           | 0.063         |
| F                | 0.080       | -           | 0.170                     | 0.003       | -           | 0.007         |

| OUTLINE DRAWINGS |             |             | SMAF                      |             |             |               |
|------------------|-------------|-------------|---------------------------|-------------|-------------|---------------|
|                  |             |             | <b>OUTLINE DIMENSIONS</b> |             |             |               |
|                  |             |             | <b>Milimeters</b>         |             |             | <b>Inches</b> |
| <b>Dim.</b>      | <b>Min.</b> | <b>Typ.</b> | <b>Max.</b>               | <b>Min.</b> | <b>Typ.</b> | <b>Max.</b>   |
| A                | -           | 5.300       | -                         | -           | 0.209       | -             |
| B                | -           | 2.060       | -                         | -           | 0.081       | -             |
| C                | -           | 1.660       | -                         | -           | 0.065       | -             |
| D                | -           | 2.070       | -                         | -           | 0.082       | -             |

| PACKING INFORMATION |      |                             |                             |                                |                          |
|---------------------|------|-----------------------------|-----------------------------|--------------------------------|--------------------------|
| Package             | Pack | Inner Box Size<br>L×W×H(mm) | Quantity<br>(pcs/Inner Box) | Outer Carton Size<br>L×W×H(mm) | Quantity<br>(pcs/carton) |
| SMAF                | T/R  | 340×340×45                  | 10000                       | 360×360×470                    | 100000                   |

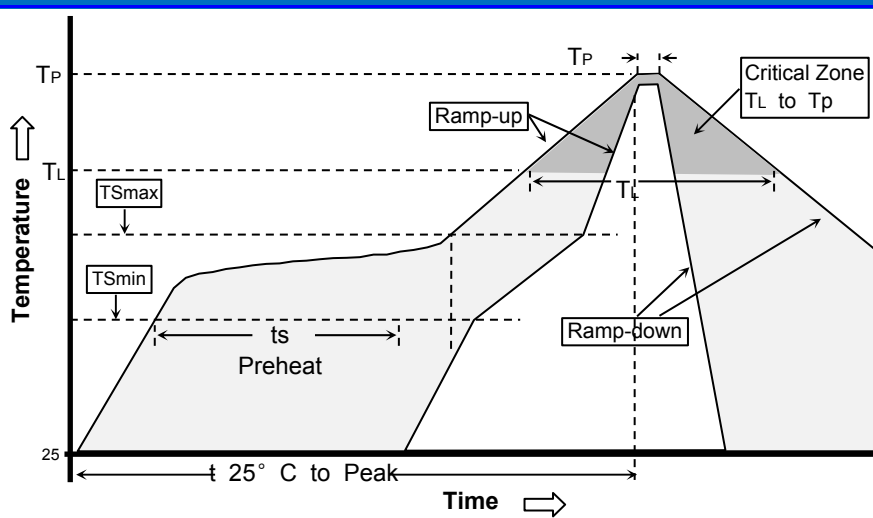
RS1AF THRU RS1MF  
FAST RECOVERY RECTIFIERS



Recommended wave soldering condition

|                 |                  |                 |
|-----------------|------------------|-----------------|
| Product         | Peak Temperature | Soldering Time  |
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

Recommended temperature profile for IR reflow



| Profile feature  | Sn-Pb eutectic Assembly          | Pb-free Assembly                 |
|--|----------------------------------|----------------------------------|
| Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )  | 3°C/second max.                  | 3°C/second max.                  |
| Preheat<br>-Temperature Min(T <sub>S</sub> min)<br>-Temperature Max(T <sub>S</sub> max)<br>-Time(t <sub>s</sub> min to t <sub>s</sub> max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature (T <sub>L</sub> )<br>- Time (t <sub>L</sub> )   | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak Temperature(T <sub>P</sub> )  | 240 +0/-5 °C                     | 260 +0/-5 °C                     |
| Time within 5°C of actual peak temperature(t <sub>p</sub> )  | 10-30 seconds                    | 20-40 seconds                    |
| Ramp down rate   | 6°C/second max.                  | 6°C/second max.                  |
| Time 25 °C to peak temperature   | 6 minutes max.                   | 8 minutes max.                   |

Note : All temperatures refer to topside of the package, measured on the package body surface.



RS1AF THRU RS1MF

FAST RECOVERY RECTIFIERS



**Disclaimer**

- Reproducing and modifying information of the document is prohibited without permission from niuhang Electronics co., LTD
- Niuhan Electronics co., LTD. reserves the rights to make changes of the content herein the document anytime without notification.
- Niuhan Electronics co., LTD. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Niuhan Electronics co., LTD. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Niuhan Electronics co., LTD. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Niuhan Electronics co., LTD. for any damages resulting from such improper use or sale.
- When the appearance of the product and chip size does not change, in order to product the customer. quality, change the internal structure and the production process Niuhan can not notify