

**RHBS6010**

Fast Recovery Bridge Rectifiers



**Voltage:** 1000 Volts

**Current:** 6.0 Amperes

**Package:** HBS

**Features**

- NH'S Fast Recovery Rectifiers Chip Technology
- Low Switching Loss For High Efficiency
- Low Leakage Current For High Reliability
- Fast Switching Speed

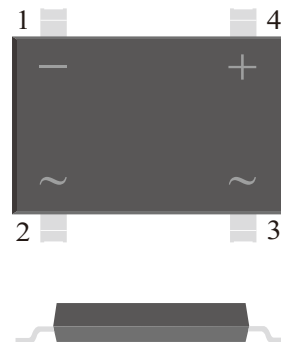
**Mechanical Data**

- **Case:** Molded With UL-94 ClassV-0 Recognized, RoHS-Compliant
- **Polarity:** Look At The Diagram And Polarity On The Right
- **Terminals:** Tin Plated Leads,Solderable Per J-STD-002 And JESD22-B102

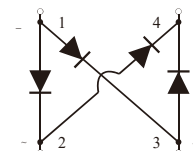
**Typical Applications**

- Switch Mode Power Supplies (SMPS)
- Fast Chargers
- LED Driver And Monitor Lighting
- Automotive Electronics And Charging Posts

**Diagram:**



**Polarity:**



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      | Ratings | Unit               |
|-------------------------------------------|----------------------------------------------------------|-------------|---------|--------------------|
| Maximum Repetitive Peak Reverse Voltage   |                                                          | $V_{RRM}$   | 1000    | V                  |
| Maximum RMS Voltag                        |                                                          | $V_{RMS}$   | 700     | V                  |
| Maximum DC Blocking Voltage               |                                                          | $V_{DC}$    | 1000    | V                  |
| Maximum Average Forward Rectified Current |                                                          | $I_{F(AV)}$ | 6.0     | A                  |
| Peak Forward Surge Current Per Diode      | 8.3ms Single Half Sine-wave<br>Superimposed On Rate Load | $I_{FSM}$   | 170     | A                  |
| Current Squared Time Per Diode            | $t < 8.3ms$                                              | $I^2t$      | 119.9   | A <sup>2</sup> sec |

**Electrical Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                               | Test Conditions                   | Symbol    | Ratings |      |      | Unit |
|---------------------------------------------------------|-----------------------------------|-----------|---------|------|------|------|
|                                                         |                                   |           | Min.    | Typ. | Max. |      |
| Instaneous Forward Voltage Per Diode                    | $I_F = 3.0 A$                     | $V_F$     | --      | 0.93 | 1.3  | V    |
| Maximum DC Reverse Current at Rated DC Blocking Voltage | Ta=25°C , $V_R = V_{RRM}$         | $I_{RRM}$ | --      | 1    | 5    | uA   |
|                                                         | Ta=125°C , $V_R = V_{RRM} * 80\%$ |           | --      | 50   | 500  | uA   |
| Typical Junction Capacitance Per Diode                  | 4 V,1MHz                          | $C_J$     | --      | 50   | --   | pF   |
| Maximum Reverse Recovery Time                           | IF=0.5A, IR=1.0A, IRR=0.25A       | $T_{rr}$  | --      | 250  | 500  | nS   |

**Thermal Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                                   | Test Conditions                                        | Symbol           | Ratings |    |     | Unit |
|-------------------------------------------------------------|--------------------------------------------------------|------------------|---------|----|-----|------|
| Operating Junction Temperature Range                        |                                                        | T <sub>J</sub>   | -55     | to | 150 | °C   |
| Storage Temperature Range                                   |                                                        | T <sub>STD</sub> | -55     | to | 150 |      |
| Thermal Resistance Junction To Ambient<br>With Steady-State | Still Air Environment<br>With Ta=25°C                  | R <sub>θJA</sub> | 50.0    |    |     | °C/W |
| Thermal Resistance Junction-Case<br>With Steady-State       | Device Mounted On<br>1 in2 FR-4 Board With 2oz. Copper | R <sub>θJC</sub> | 10.0    |    |     |      |

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

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Typical Characteristics Curves

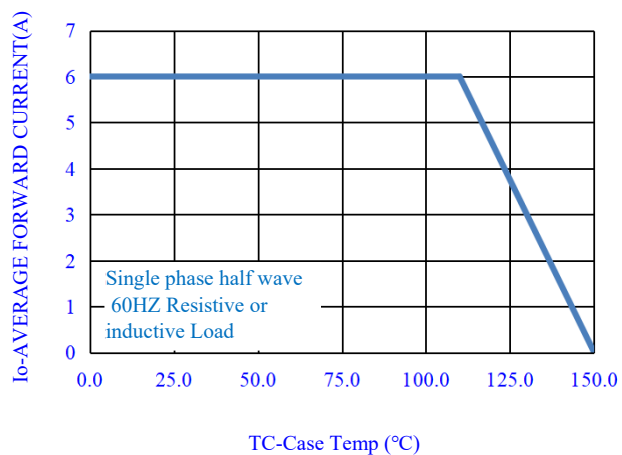


Fig.1-FORWARD CURRENT DERATING CURVE

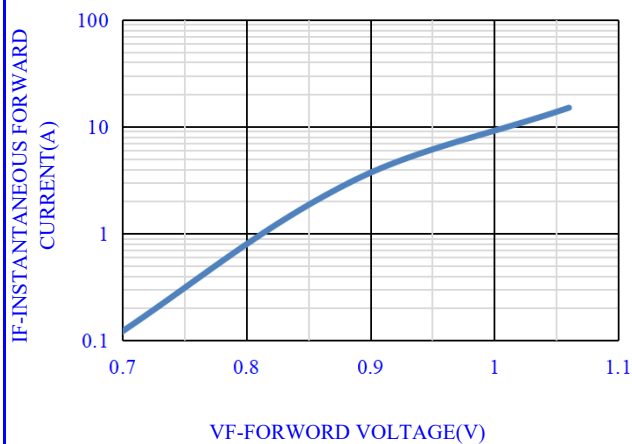


Fig.2- TYPICAL INSTANTANEOUS FORWARD

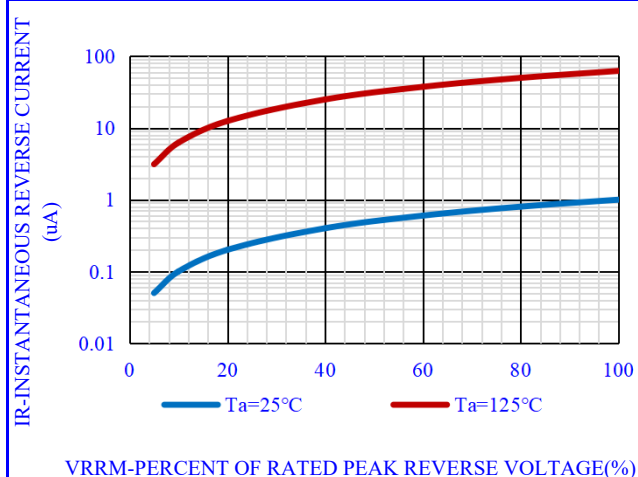


Fig.3- TYPICAL REVERSE CHARACTERISTICS

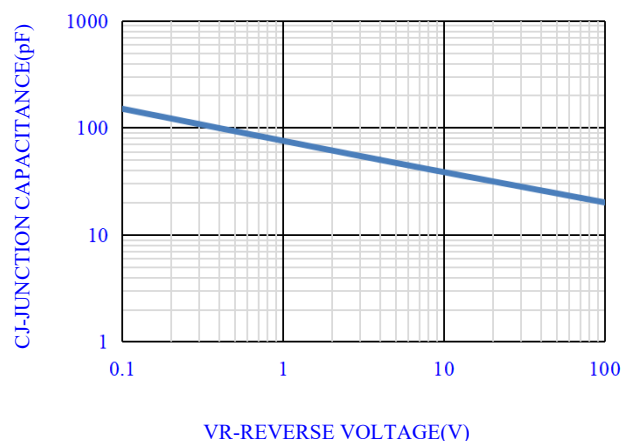


Fig.4- TYPICAL JUNCTION CAPACITANCE

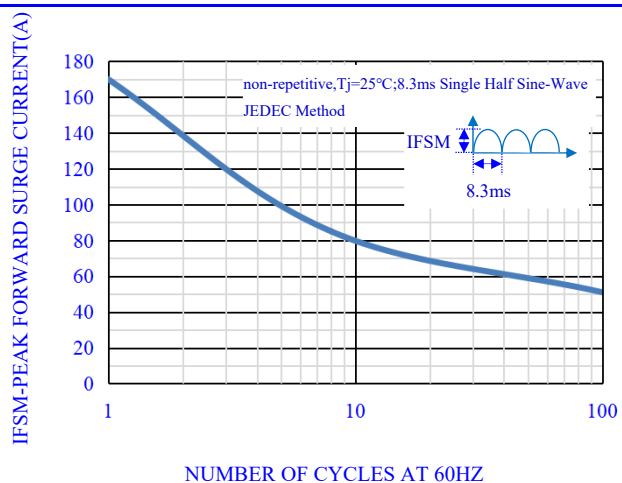


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

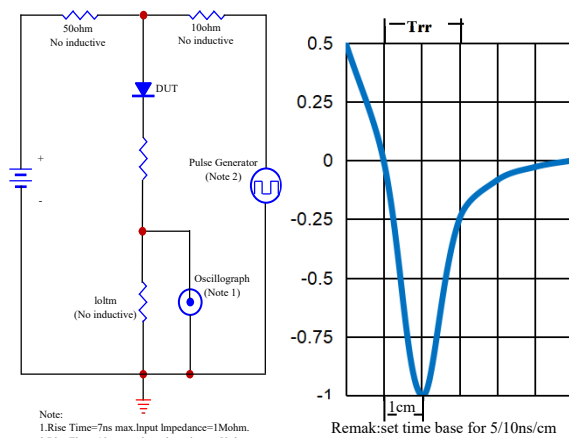


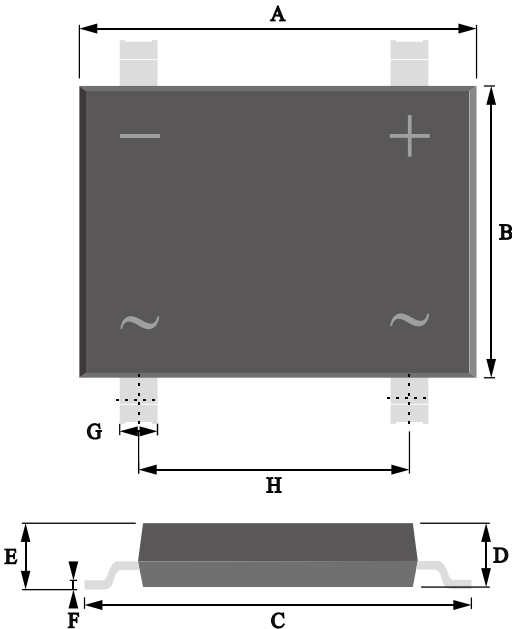
Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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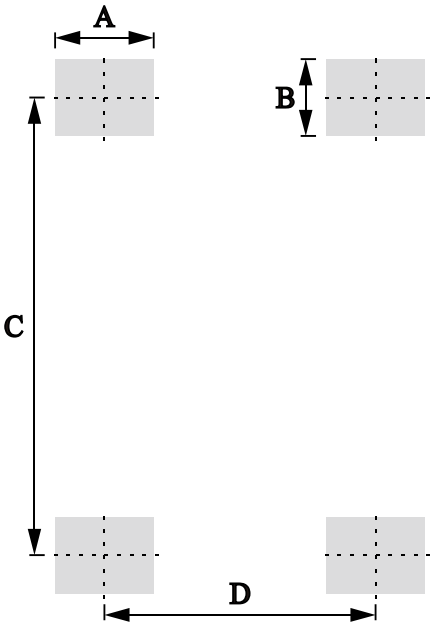
OUTLINE DRAWINGS



HBS

| OUTLINE DIMENSIONS |            |      |       |        |      |        |
|--------------------|------------|------|-------|--------|------|--------|
| Dim.               | Milimeters |      |       | Inches |      |        |
|                    | Min.       | Typ. | Max.  | Min.   | Typ. | Max.   |
| A                  | 9.55       | -    | 11.05 | 0.3760 | -    | 0.4350 |
| B                  | 6.90       | -    | 7.90  | 0.2717 | -    | 0.3110 |
| C                  | 9.35       | -    | 10.65 | 0.3681 | -    | 0.4193 |
| D                  | 1.40       | -    | 1.90  | 0.0551 | -    | 0.0748 |
| E                  | 1.40       | -    | 2.00  | 0.0551 | -    | 0.0787 |
| F                  | 0.15       | -    | 0.35  | 0.0059 | -    | 0.0138 |
| G                  | 1.60       | -    | 2.00  | 0.0630 |      | 0.0787 |
| H                  | 4.50       | -    | 5.50  | 0.1772 | -    | 0.2165 |

RECOMMEDND LAYOUT DRAWINGS



HBS

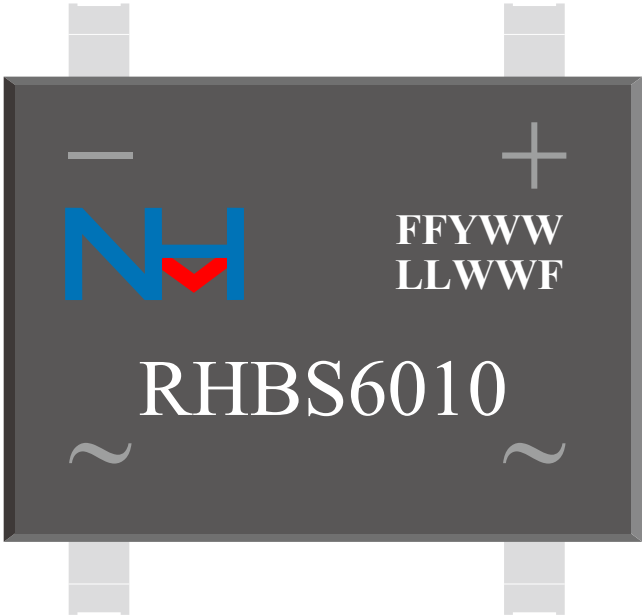
| OUTLINE DIMENSIONS |            |      |      |        |        |      |
|--------------------|------------|------|------|--------|--------|------|
| Dim.               | Milimeters |      |      | Inches |        |      |
|                    | Min.       | Typ. | Max. | Min.   | Typ.   | Max. |
| A                  | -          | 2.00 | -    | -      | 0.0787 | -    |
| B                  | -          | 1.50 | -    | -      | 0.0591 | -    |
| C                  | -          | 8.90 | -    | -      | 0.3504 | -    |
| D                  | -          | 4.50 | -    | -      | 0.1772 | -    |

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MARKING



MARKING INSTRUCTION

NH=Niuhang Trademark  
FF=Product Line Code,According To Actual Changes  
YWW=Date Code,According To Actual Changes  
LLWWF=Internal Code,According To Actual Changes  
RHBS6010=Model

PACKING INFORMATION

| Package Type | Package Code | Product Weight<br>Approx(g/Pcs) | Package Method | Quantity<br>(Pcs/Min. Pack.) | Quantity<br>(Pcs/Inner Box) | Quantity<br>(Pcs/Carton) |
|--------------|--------------|---------------------------------|----------------|------------------------------|-----------------------------|--------------------------|
| HBS          | P1           | 0.107                           | 13" Reel       | 2500                         | 2500                        | 20000                    |

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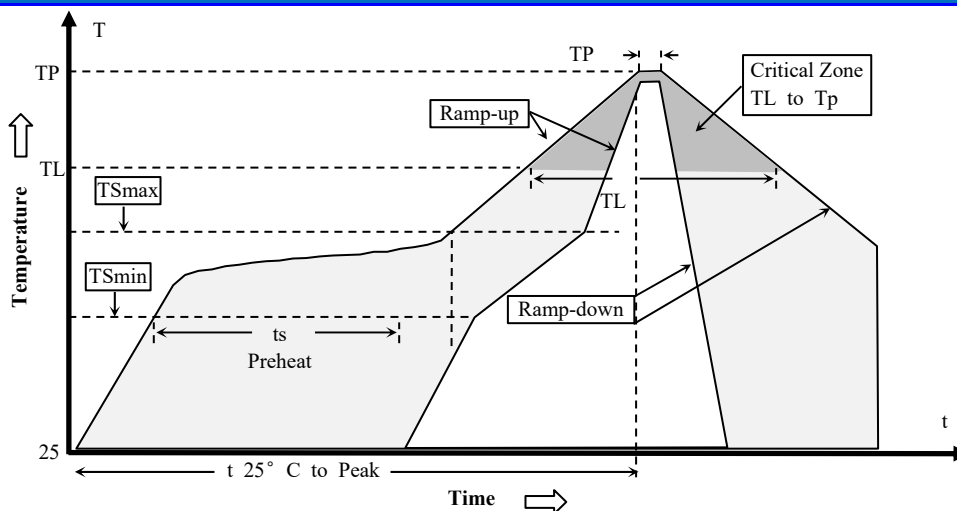
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**Recommended wave soldering condition**

| 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<br>(T <sub>smax</sub> to T <sub>p</sub> )                             | 3°C/second max.                  | 3°C/second max.                  |
| Preheat<br>-Temperature Min(TS min)<br>-Temperature Max(TS max)<br>-Time(ts min to ts max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature (TL)<br>- Time (tL)                                 | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak Temperature(TP)                                                                       | 240 +0/-5 °C                     | 260 +0/-5 °C                     |
| Time within 5°C of actual peak<br>temperature(tp)                                          | 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.

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