

## SBL5010

### FAST RECOVERY BRIDGE RECTIFIERS



**VOLTAGE:** 1000 Volts

**CURRENT:** 5.0 Amperes

**SBL**

**Marking & Schematic diagram**

#### FEATURES

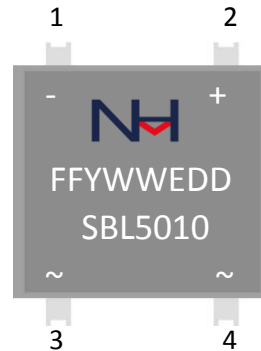
- Glass passivated die construction
- low forward voltage drop
- High surge current capability(IFSM)
- Good soft recovery features are good for EMC
- Small high-temperature leakage current(IR)
- Good consistency in electrical performance

#### MECHANICAL DATA

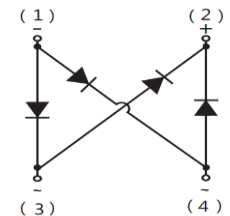
- **Case:** SBL  
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant
- **Mounting Position:** Any
- **Weight:** App. 0.440 grams(0.0155ounce)

#### TYPICAL APPLICATIONS

- Applied to high-frequency power converters such as PD chargers and adapters



| PIN | DISCRIPTION       |
|-----|-------------------|
| 1   | Output Cathode(-) |
| 2   | Output Anode(+)   |
| 3   | Input Pin(-)      |
| 4   | Input Pin(-)      |



Remark:

- ①. NH=niuhang trademark
- ②. FF=Product line code,According to actual changes  
YWW=Data code,According to actual changes  
EDD=Inernal code,According to actual changes
- ③. SBL5010=Modle
- ④. "- ~ ~ +"=Polarity mark

Single phase,half wave,60Hz,resistive or inductive load.For capacitive load,derate current by 20%

#### Maximum Ratings (Ratings at 25°C ambient temperature unless otherwise specified )

| Parameter                                                                                       | Symbol      | SBL5010 | 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 @ TC=100°C (see fig.1)                                | $I_{F(AV)}$ | 5.0     | A                  |
| Peak Forward Surge Current 8.3ms Single Half Sine-wave Superimposed On Rate Load (JEDEC Method) | $I_{FSM}$   | 180     | A                  |
| Current Squared Time Per Diode( $t < 8.3ms$ )                                                   | $I^2 t$     | 134.46  | A <sup>2</sup> sec |

#### Electrical Characteristics (Ratings at 25°C ambient temperature unless otherwise specified )

| Parameter                                                        | Test Conditions             | Symbol    | SBL5010 |      |      | Unit |
|------------------------------------------------------------------|-----------------------------|-----------|---------|------|------|------|
|                                                                  |                             |           | Min.    | Typ. | Max. |      |
| Maximum Forward Voltage Per Diode (Note 1)                       | Ta=25°C IF= 5.0 A           | $V_{FM}$  | --      | 0.93 | 1.1  | V    |
| Maximum DC Reverse Current at Rated DC Blocking Voltage (Note 1) | Ta=25°C VR= 1000 V          | $I_{RRM}$ | --      | 0.50 | 10   | uA   |
|                                                                  | Ta=125°C VR= 1000 V         |           | --      | 50   | 500  |      |
| Typical Junction Capacitance Per Diode                           | IF=0.5A, IR=1.0A, IRR=0.25A | $C_J$     | 60      |      |      | pF   |

#### Thermal Characteristics (Ratings at 25°C ambient temperature unless otherwise specified )

| Parameter                            | Symbol          | SBL5010    | Unit |
|--------------------------------------|-----------------|------------|------|
| Operating Junction Temperature Range | $T_J$           | -55 to 150 | °C   |
| Storage Temperature Range            | $T_{STD}$       | -55 to 150 |      |
| Typical thermal resistance (Note 2)  | $R_{\theta JA}$ | 60.0       | °C/W |
|                                      | $R_{\theta JC}$ | 10.0       |      |

Notes 1. Pulse test: 300  $\mu$ s pulse width,1% duty cycle

2. Device mounted on Device mounted on 75mm x 45mm x 5.5mm Aluminum Plate Heatsink.

# SBL5010

## FAST RECOVERY BRIDGE RECTIFIERS



### RATING AND CHARACTERISTIC CURVES

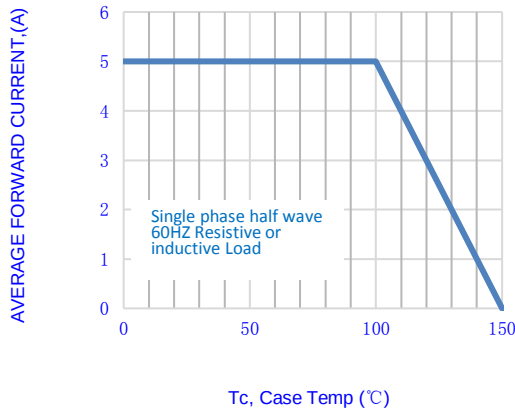


Fig.1-FORWARD CURRENT DERATING CURVE

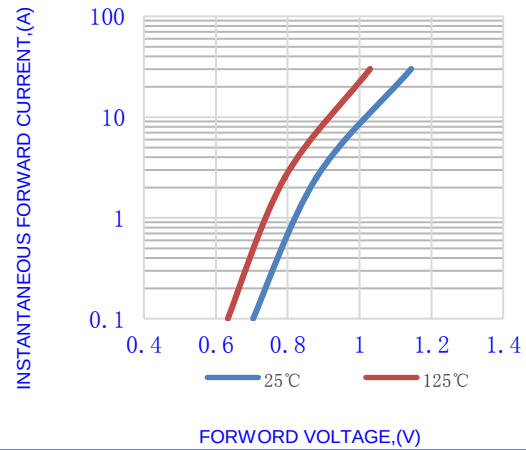


Fig.2- TYPICAL INSTANTANEOUS FORWARD

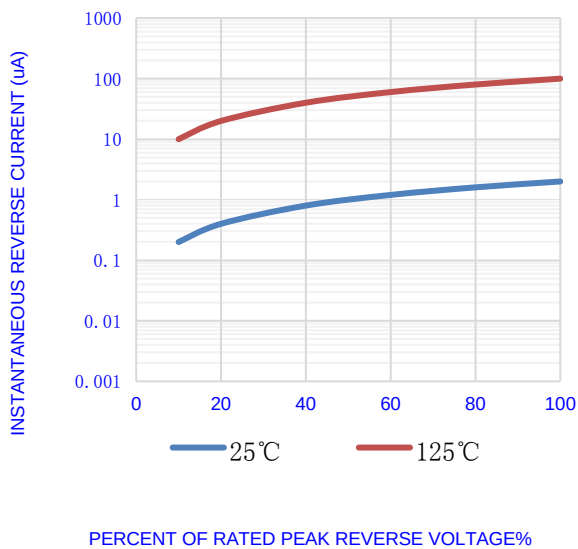


Fig.3- TYPICAL REVERSE CHARACTERISTICS

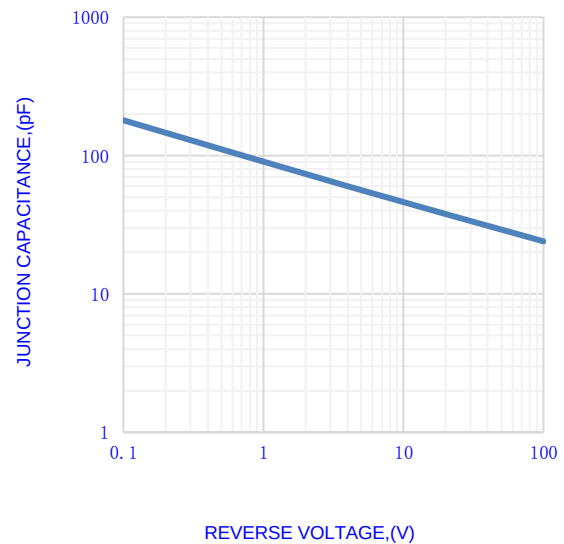


Fig.4- TYPICAL JUNCTION CAPACITANCE

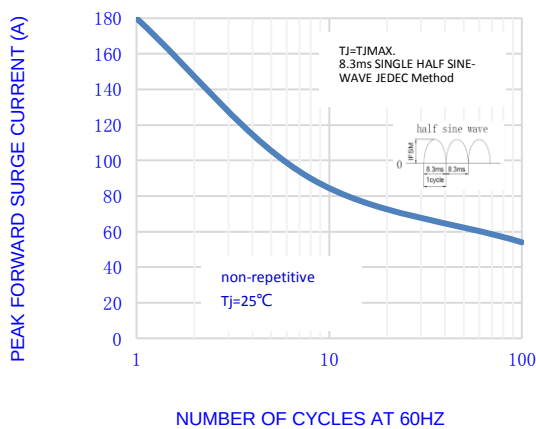


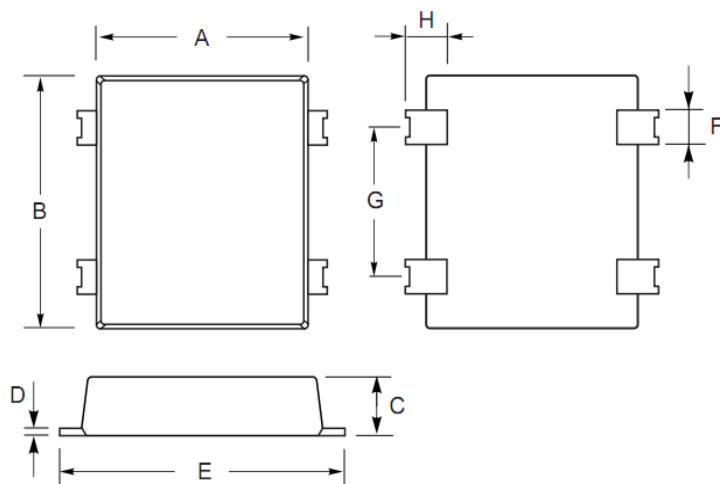
Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

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FAST RECOVERY BRIDGE RECTIFIERS



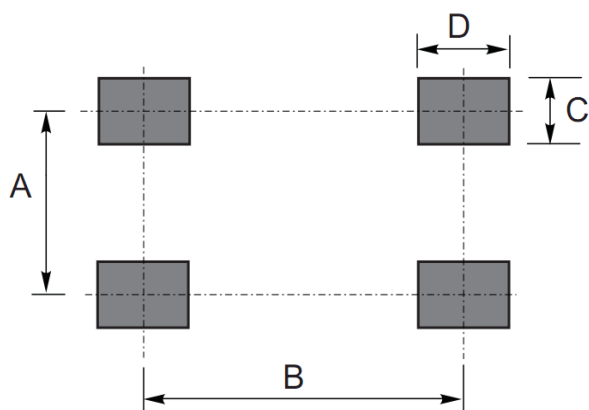
**OUTLINE DRAWINGS**



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| OUTLINE DIMENSIONS |             |      |       |        |      |       |
|--------------------|-------------|------|-------|--------|------|-------|
| Dim.               | Millimeters |      |       | Inches |      |       |
|                    | Min.        | Typ. | Max.  | Min.   | Typ. | Max.  |
| A                  | 8.40        | -    | 8.80  | 0.331  | -    | 0.346 |
| B                  | 9.40        | -    | 9.80  | 0.370  | -    | 0.386 |
| C                  | 1.35        | -    | 1.75  | 0.053  | -    | 0.069 |
| D                  | 0.25        | -    | 0.55  | 0.010  | -    | 0.022 |
| E                  | 9.80        | -    | 10.20 | 0.386  | -    | 0.402 |
| F                  | 1.25        | -    | 1.55  | 0.049  | -    | 0.061 |
| G                  | 4.90        | -    | 5.30  | 0.193  | -    | 0.209 |
| H                  | 0.85        | -    | 1.25  | 0.033  | -    | 0.049 |

**RECOMMENDED LAYOUT DRAWINGS**



**SBL**

| RECOMMENDED LAYOUT DIMENSIONS |             |       |      |        |       |      |
|-------------------------------|-------------|-------|------|--------|-------|------|
| Dim.                          | Millimeters |       |      | Inches |       |      |
|                               | Min.        | Typ.  | Max. | Min.   | Typ.  | Max. |
| A                             | -           | 5.100 | -    | -      | 0.201 |      |
| B                             | -           | 8.700 | -    | -      | 0.343 |      |
| C                             | -           | 2.100 | -    | -      | 0.083 |      |
| D                             | -           | 1.800 | -    | -      | 0.071 |      |

**PACKING INFORMATION**

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| Package Method | Reel Size (mm) | Quantity (pcs/reel) | Inner Box Size L×W×H(mm) | Quantity (pcs/Inner Box) | Carton Size L×W×H(mm) | Quantity (pcs/carton) |
|----------------|----------------|---------------------|--------------------------|--------------------------|-----------------------|-----------------------|
| Tape Reel      | Φ330           | 3000                | 340×340×45               | 6000                     | 360×360×240           | 30000                 |

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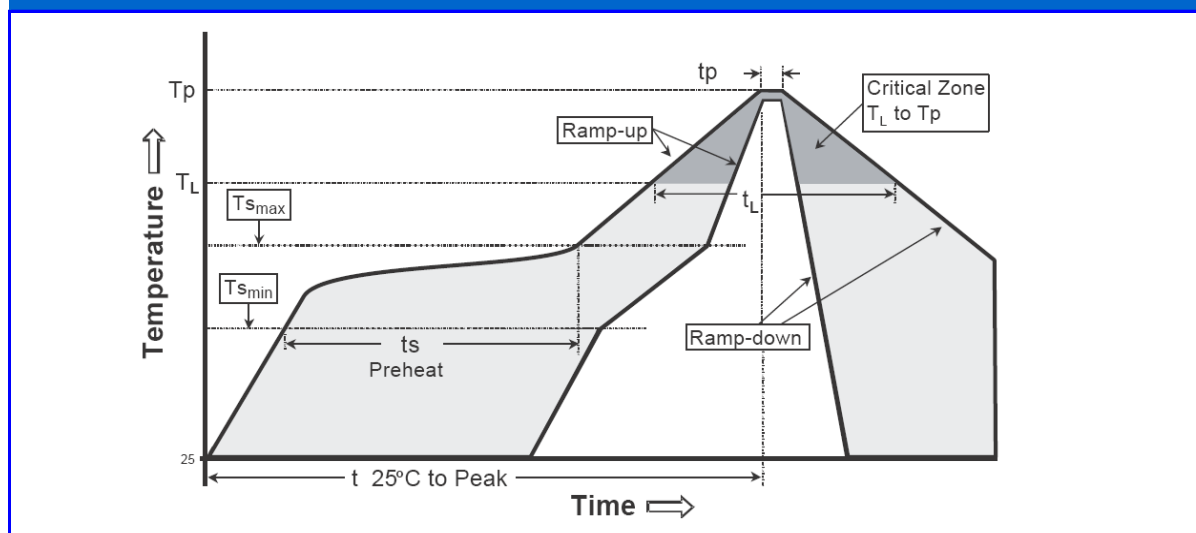
**FAST RECOVERY BRIDGE RECTIFIERS**



**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(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 (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(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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