RB521SM-30
Schottky Barrier Diode

Outline

* Features
  - High reliability
  - Small mold type
  - Super Low $V_F$

* Inner Circuit

* Application
  - Small current rectification

* Structure
  - Epitaxial planar

* Absolute Maximum Ratings ($T_a = 25^\circ C$ unless otherwise stated)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Limits</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse voltage</td>
<td>$V_{R}$</td>
<td>Reverse direct voltage</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>Average rectified forward current</td>
<td>$I_o$</td>
<td>Glass epoxy mounted, 60Hz half sin waveform, resistive load</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>Peak forward surge current</td>
<td>$I_{FSM}$</td>
<td>60Hz half sin waveform, Non-repetitive, one cycle, $T_a=25^\circ C$</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>Junction temperature</td>
<td>$T_j$</td>
<td>-</td>
<td>-150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{stg}$</td>
<td>-</td>
<td>-40 ~ 150</td>
<td>°C</td>
</tr>
</tbody>
</table>

* Characteristics ($T_a = 25^\circ C$ unless otherwise stated)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward voltage</td>
<td>$V_{F1}$</td>
<td>$I_f=200mA$</td>
<td>-</td>
<td>-</td>
<td>0.47</td>
<td>V</td>
</tr>
<tr>
<td>Reverse current</td>
<td>$I_R$</td>
<td>$V_R=10V$</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>μA</td>
</tr>
</tbody>
</table>

*Caution: static electricity

Attention

Compared with PN junction diodes, Schottky Barrier Diode is generally high reverse current ($I_R$). The reverse loss of the diode might increase as temperature increasing that causes heat-up and further $I_R$. This phenomenon might end up the thermal destruction (thermal runaway). Therefore please give consideration to the reverse loss and the ambient temperature when using this product.
● Characteristic Curves

Forward Voltage: $V_f (\text{mV})$
Forward Current: $I_f (\text{mA})$

Reverse Voltage: $V_r (\text{V})$
Reverse Current: $I_r (\mu\text{A})$

Peak Surge Forward Current: $I_{f\text{sur}} (\text{A})$
Number of Cycles: $I_{f\text{sur}}$ Cycle Characteristics

Peak Surge Forward Current: $I_{f\text{sur}} (\text{A})$
Time: $t (\text{ms})$
$I_{f\text{sur}}$ Characteristics
● Characteristic Curves

1. Capacitance Between Terminals $C_{\text{p}}$ ($\text{pF}$)

   - Graph shows capacitance variations with reverse voltage $V_{\text{r}}$.
   - Frequency $f = 1\text{MHz}$
   - Temperature $T = 25^\circ\text{C}$

2. Transient Thermal Impedance $R_{\text{th},\text{JA}}$ ($^\circ\text{C/W}$)

   - Graph depicts impedance changes with time $t$.
   - Data points indicate different conditions.

3. Average Rectified Forward Current $I_{\text{FM}}$ (mA)

   - Graph illustrates current variations with ambient temperature $T_\text{a}$.
   - Derating curve $I_{\text{FM}} = f(T_\text{a})$.
   - Conditions include $D = 1/2$, $V_\text{D} = 15\text{V}$, and $T = 150^\circ\text{C}$.

4. Average Rectified Forward Current $I_{\text{FM}}$ (mA)

   - Graph shows current changes with case temperature $T_\text{C}$.
   - Derating curve $I_{\text{FM}} = f(T_\text{C})$.
   - Conditions include $D = 1/2$, $V_\text{C} = 15\text{V}$, and $T = 150^\circ\text{C}$.

Substrate conditions:
- Material: glass epoxy substrate (FR4)
- Size: 20mm x 20mm x 0.8mm
- Both sides are all copper (35μm thickness)
● Dimensions (SOD-523 SC-79 EMD2)

![Diagram of Dimensions]

<table>
<thead>
<tr>
<th>DIM</th>
<th>Millimeters</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Average</td>
</tr>
<tr>
<td>A</td>
<td>0.50</td>
<td>0.60</td>
</tr>
<tr>
<td>b</td>
<td>0.25</td>
<td>0.30</td>
</tr>
<tr>
<td>c</td>
<td>0.07</td>
<td>0.12</td>
</tr>
<tr>
<td>D</td>
<td>0.75</td>
<td>0.80</td>
</tr>
<tr>
<td>E</td>
<td>1.15</td>
<td>1.20</td>
</tr>
<tr>
<td>Hc</td>
<td>1.50</td>
<td>1.60</td>
</tr>
<tr>
<td>h1</td>
<td>-</td>
<td>0.60</td>
</tr>
<tr>
<td>b3</td>
<td>-</td>
<td>0.80</td>
</tr>
<tr>
<td>e1</td>
<td>-</td>
<td>1.70</td>
</tr>
</tbody>
</table>

(1) The marking bar indicates the cathode.
(2) The direction indicates the anode.

● Taping (Unit:mm)

![Diagram of Taping]
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(Note1) Medical Equipment Classification of the Specific Applications

<table>
<thead>
<tr>
<th>JAPAN</th>
<th>USA</th>
<th>EU</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS III</td>
<td>CLASS III</td>
<td>CLASS II b</td>
<td>CLASS III</td>
</tr>
</tbody>
</table>

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[d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
[e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
[f] Sealing or coating our Products with resin or other coating materials
[g] Use of our Products without cleaning residue of flux (Exclude cases where no-clean type fluxes is used. However, recommend sufficiently about the residue.) ; or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
[h] Use of the Products in places subject to dew condensation

4. The Products are not subject to radiation-proof design.

5. Please verify and confirm characteristics of the final or mounted products in using the Products.

6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse, is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.

8. Confirm that operation temperature is within the specified range described in the product specification.

9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.

2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification
Precautions Regarding Application Examples and External Circuits

1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.

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Precaution for Electrostatic
This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

Precaution for Storage / Transportation

1. Performance and soldered connections may deteriorate if the Products are stored in the places where:
   [a] the Products are exposed to sea winds or corrosive gases, including Cl2, H2S, NH3, SO2, and NO2
   [b] the temperature or humidity exceeds those recommended by ROHM
   [c] the Products are exposed to direct sunshine or condensation
   [d] the Products are exposed to high Electrostatic

2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.

3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.

4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

Precaution for Product Label
A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

Precaution for Disposition
When disposing Products please dispose them properly using an authorized industry waste company.

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