\[ V_{RM} = 600 \text{ V}, \quad I_{F(AV)} = 2.0 \text{ A}, \quad t_{rr} = 50 \text{ ns} \]

Fast Recovery Diode

**SJPL-H6**

**Description**

The SJPL-H6 is a fast recovery diode of 600 V / 2.0 A. The maximum \( t_{rr} \) of 50 ns is realized by optimizing a life-time control.

**Features**

- \( V_{RM} \) = 600 V
- \( I_{F(AV)} \) = 2.0 A
- \( V_F \) = 1.5 V
- \( t_{rr} \) = 50 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Suitable for High Reliability and Automotive Requirement.

**Applications**

- Freewheel Diode
  (Offline Buck and Buck-boost Converter)

**Package**

**SJP**

\[ (1) \quad (2) \]

Not to scale
**Absolute Maximum Ratings**

Unless otherwise specified, \( T_A = 25 \, ^\circ\text{C} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Repetitive Reverse Voltage</td>
<td>( V_{RSM} )</td>
<td>600</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Repetitive Reverse Voltage</td>
<td>( V_{RM} )</td>
<td>600</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Average Forward Current</td>
<td>( I_{F(AV)} )</td>
<td>2.0</td>
<td>A</td>
<td>See Figure 1 and Figure 2</td>
</tr>
<tr>
<td>Surge Forward Current</td>
<td>( I_{FSM} )</td>
<td>30</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>( I^t ) Limiting Value</td>
<td>( I^t )</td>
<td>4.5</td>
<td>A^2s</td>
<td>1 ms ( \leq t \leq 10 ) ms</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>( T_J )</td>
<td>−40 to 150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{STG} )</td>
<td>−40 to 150</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Characteristics**

Unless otherwise specified, \( T_A = 25 \, ^\circ\text{C} \)

<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 Drop</td>
<td>( V_F )</td>
<td>( T_J = 25 , ^\circ\text{C}, , I_F = 2.0 ) A</td>
<td>—</td>
<td>—</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( T_J = 100 , ^\circ\text{C}, , I_F = 2.0 ) A</td>
<td>—</td>
<td>1.1</td>
<td>—</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Leakage Current</td>
<td>( I_R )</td>
<td>( V_R = V_{RM} )</td>
<td>—</td>
<td>—</td>
<td>50</td>
<td>( \mu \text{A} )</td>
</tr>
<tr>
<td>Reverse Leakage Current</td>
<td>( H_{IR} )</td>
<td>( V_R = V_{RM}, , T_J = 150 , ^\circ\text{C} )</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>( \mu \text{A} )</td>
</tr>
<tr>
<td>Reverse Recovery Time</td>
<td>( t_{r1} )</td>
<td>( I_F = I_{RP} = 100 , \text{mA}, , 90% ) recovery point, ( T_J = 25 , ^\circ\text{C} )</td>
<td>—</td>
<td>—</td>
<td>50</td>
<td>( \text{ns} )</td>
</tr>
<tr>
<td></td>
<td>( t_{r2} )</td>
<td>( I_F = 100 , \text{mA}, , I_{RP} = 200 , \text{mA}, , 75% ) recovery point, ( T_J = 25 , ^\circ\text{C} )</td>
<td>—</td>
<td>—</td>
<td>35</td>
<td>( \text{ns} )</td>
</tr>
<tr>
<td>Thermal Resistance(^{(1)})</td>
<td>( R_{th(J-L)} )</td>
<td>—</td>
<td>—</td>
<td>20</td>
<td>( ^\circ\text{C}/\text{W} )</td>
<td></td>
</tr>
</tbody>
</table>

\(^{(1)}\) \( R_{th(J-L)} \) is thermal resistance between junction and lead.
Rating and Characteristic Curves

Figure 1. $T_C$ vs. $I_{F(AV)}$ Typical Characteristics ($V_R = 0$ V)

Figure 2. $T_C$ vs. $I_{F(AV)}$ Typical Characteristics ($V_R = 600$ V)

Figure 3. $V_F$ vs. $I_F$ Typical Characteristics

Figure 4. $V_R$ vs. $I_R$ Typical Characteristics
**SJPL-H6**

**Physical Dimensions**

- **SJP Package**

![Diagram of SJP Package]

**NOTES:**
- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, be sure to minimize the working time, within the following limits:
  - Flow: 260 ± 5 °C / 10 ± 1 s, 2 times
  - Soldering Iron: 380 ± 10 °C / 3.5 ± 0.5 s, 1 time
- MSL: JEDEC LEVEL1

- **SJP Land Pattern Example**

![Diagram of Land Pattern Example]

**NOTE:**
- Dimensions in millimeters
Marking Diagram

Lot Number:
- Y is the last digit of the year of manufacture (0 to 9)
- M is the month of the year (1 to 9, O, N, or D)
- DD is the day of the month (01 to 31)

YMDD

Cathode Mark

Specific Device Code (See Table 1)

Table 1. Specific Device Code

<table>
<thead>
<tr>
<th>Specific Device Code</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH6</td>
<td>SJPL-H6</td>
</tr>
</tbody>
</table>
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