Description

The SJPL-L4 is a fast recovery diode of 400 V / 3.0 A. The maximum \( t_{rr} \) of 50 ns is realized by optimizing a life-time control.

Features

- \( V_{RM} \) = 400 V
- \( I_{F(AV)} \) = 3.0 A
- \( V_F \) = 1.3 V
- \( t_{rr} \) = 50 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Suitable for High Reliability and Automotive Requirement.

Applications

- White Goods
- Audiovisual Equipment
- Lighting Equipment
- Industrial Electronic Equipment
  (Communication Equipment and Factory Automation)
- Secondary Side Rectifier Diode
  (Flyback Converter, LLC Converter, etc.)
- Freewheel Diode
  (Offline Buck and Buck-boost Converter)

Package

SJP

Not to scale
### Absolute Maximum Ratings
Unless otherwise specified, $T_A = 25 \, ^\circ C$

<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>400</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Repetitive Reverse Voltage</td>
<td>$V_{RM}$</td>
<td>400</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Average Forward Current</td>
<td>$I_{F(\text{AV})}$</td>
<td>3.0</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>Half cycle sine wave, positive side, 10 ms, 1 shot</td>
</tr>
<tr>
<td>$I^2t$ Limiting Value</td>
<td>$I^2t$</td>
<td>4.5</td>
<td>A$^2$s</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, $T_A = 25 \, ^\circ C$

<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>$T_J = 25 , ^\circ C, \ I_F = 3.0 , A$</td>
<td>—</td>
<td>—</td>
<td>1.3</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$T_J = 100 , ^\circ C, \ I_F = 3.0 , A$</td>
<td>—</td>
<td>0.98</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>μA</td>
</tr>
<tr>
<td>Reverse Leakage Current Under High Temperature</td>
<td>$H \cdot I_R$</td>
<td>$V_R = V_{RM}, \ T_J = 150 , ^\circ C$</td>
<td>—</td>
<td>—</td>
<td>100</td>
<td>μA</td>
</tr>
<tr>
<td>Reverse Recovery Time</td>
<td>$t_{r1}$</td>
<td>$I_F = I_{RP} = 100 , mA$ 90% recovery point, $T_J = 25 , ^\circ C$</td>
<td>—</td>
<td>—</td>
<td>50</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>$t_{r2}$</td>
<td>$I_F = 100 , mA, \ I_{RP} = 200 , mA, 75%$ recovery point, $T_J = 25 , ^\circ C$</td>
<td>—</td>
<td>—</td>
<td>35</td>
<td>ns</td>
</tr>
<tr>
<td>Thermal Resistance$^{(1)}$</td>
<td>$R_{\text{th(J-L)}}$</td>
<td>—</td>
<td>—</td>
<td>20</td>
<td>°C/W</td>
<td></td>
</tr>
</tbody>
</table>

$^{(1)}R_{\text{th(J-L)}}$ 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 ($V_R = 400$ V)

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

Figure 4. $V_R$ vs. $I_R$ Typical Characteristics
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 SJP Land Pattern Example]

NOTE:
- Dimensions in millimeters
Marking Diagram

Cathode Mark

YMDD

Specific Device Code (See Table 1)

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)

Table 1. Specific Device Code

<table>
<thead>
<tr>
<th>Specific Device Code</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>LL4</td>
<td>SJPL-L4</td>
</tr>
</tbody>
</table>
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