

**$V_{RM} = 600\text{ V}$ ,  $I_{F(AV)} = 2.0\text{ A}$ ,  $t_{rr} = 50\text{ ns}$**   
**Fast Recovery Diode**  
**SJPL-H6**

**Description**

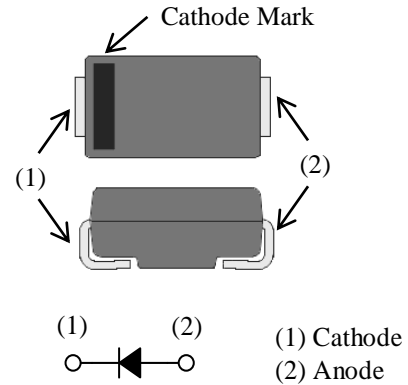
The SJPL-H6 is a fast recovery diode of 600 V / 2.0 A. The maximum  $t_{rr}$  of 50 ns is realized by optimizing a life-time control.

**Features**

- $V_{RM}$ ----- 600 V
- $I_{F(AV)}$ ----- 2.0 A
- $V_F$ ----- 1.5 V
- $t_{rr1}$ ----- 50 ns
- Bare Lead Frame: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0
- Suitable for High Reliability and Automotive Requirement.

**Package**

SJP



Not to scale

**Applications**

- Freewheel Diode  
(Offline Buck Converter, Offline Buck-boost Converter, etc.)

**Absolute Maximum Ratings**

Unless otherwise specified,  $T_A = 25\text{ }^\circ\text{C}$ .

| Parameter                          | Symbol      | Conditions   | Rating     | Unit                 |
|------------------------------------|-------------|--|------------|----------------------|
| Nonrepetitive Peak Reverse Voltage | $V_{RSM}$   |  | 600        | V                    |
| Repetitive Peak Reverse Voltage    | $V_{RM}$    |  | 600        | V                    |
| Average Forward Current            | $I_{F(AV)}$ | See Figure 2 and Figure 3                          | 2.0        | A                    |
| Surge Forward Current              | $I_{FSM}$   | Half cycle sine wave, positive side, 10 ms, 1 shot | 30         | A                    |
| $I^2t$ Limiting Value              | $I^2t$      | $1\text{ ms} \leq t \leq 10\text{ ms}$             | 4.5        | $\text{A}^2\text{s}$ |
| Junction Temperature               | $T_J$       |  | -40 to 150 | $^\circ\text{C}$     |
| Storage Temperature                | $T_{STG}$   |  | -40 to 150 | $^\circ\text{C}$     |

**Electrical Characteristics**

Unless otherwise specified,  $T_A = 25\text{ }^\circ\text{C}$ .

| Parameter                                      | Symbol        | Conditions   | Min. | Typ. | Max. | Unit               |
|--|---------------|--|------|------|------|--------------------|
| Forward Voltage Drop                           | $V_F$         | $T_J = 25\text{ }^\circ\text{C}$ , $I_F = 2.0\text{ A}$  | —    | —    | 1.5  | V                  |
|  |               | $T_J = 100\text{ }^\circ\text{C}$ , $I_F = 2.0\text{ A}$   | —    | 1.1  | —    | V                  |
| Reverse Leakage Current                        | $I_R$         | $V_R = V_{RM}$   | —    | —    | 50   | $\mu\text{A}$      |
| Reverse Leakage Current under High Temperature | $H \cdot I_R$ | $V_R = V_{RM}$ , $T_J = 150\text{ }^\circ\text{C}$   | —    | —    | 100  | $\mu\text{A}$      |
| Reverse Recovery Time                          | $t_{rr1}$     | $I_F = I_{RP} = 100\text{ mA}$ ,<br>90% recovery point,<br>$T_J = 25\text{ }^\circ\text{C}$                      | —    | —    | 50   | ns                 |
|  | $t_{rr2}$     | $I_F = 100\text{ mA}$ ,<br>$I_{RP} = 200\text{ mA}$ ,<br>75% recovery point,<br>$T_J = 25\text{ }^\circ\text{C}$ | —    | —    | 35   | ns                 |
| Thermal Resistance <sup>(1)</sup>              | $R_{th(J-L)}$ |  | —    | —    | 20   | $^\circ\text{C/W}$ |

**Mechanical Characteristics**

| Parameter      | Conditions | Min. | Typ.  | Max. | Unit |
|----------------|------------|------|-------|------|------|
| Package Weight |            | —    | 0.072 | —    | g    |

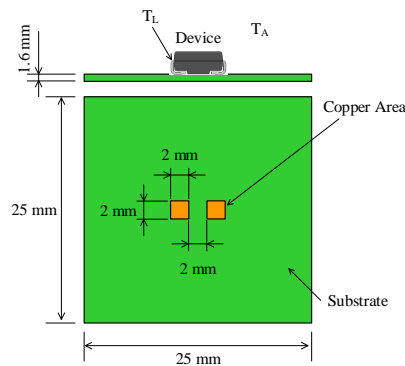


Figure 1. Lead Temperature Measurement Conditions

<sup>(1)</sup>  $R_{th(J-L)}$  is thermal resistance between junction and lead. Case temperature ( $T_L$ ) is measured near the root of pin (see Figure 1).

Derating Curves

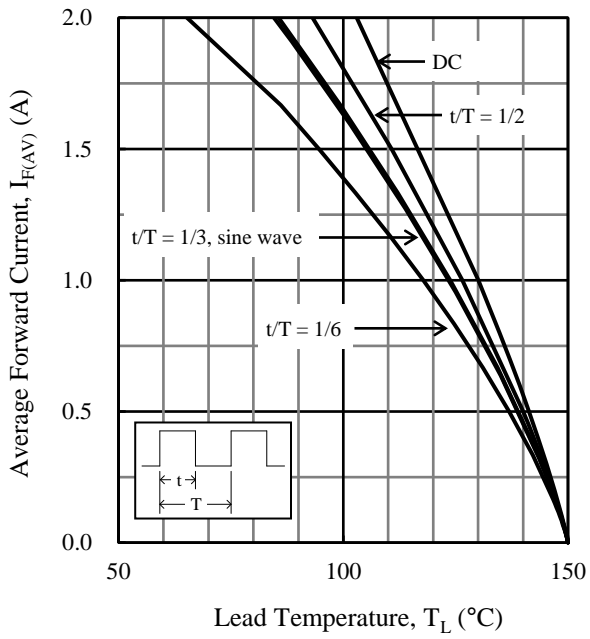


Figure 2.  $I_{F(AV)}$  vs.  $T_L$  ( $T_J = 150$  °C,  $V_R = 0$  V)

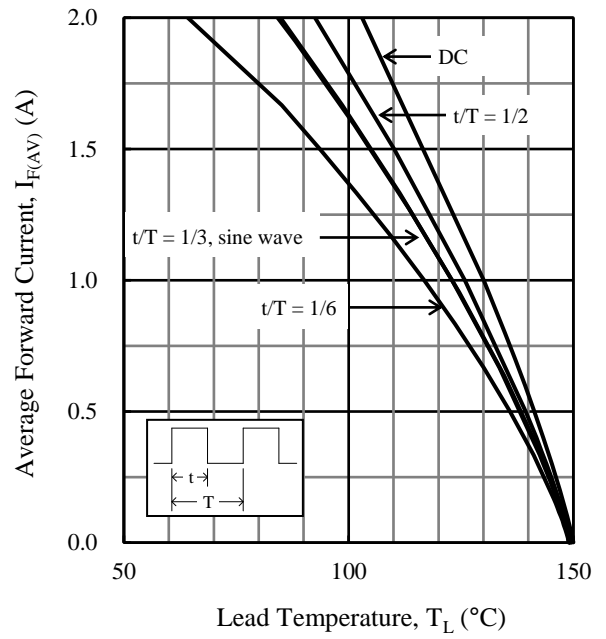


Figure 3.  $I_{F(AV)}$  vs.  $T_L$  ( $T_J = 150$  °C,  $V_R = 600$  V)

Characteristic Curves

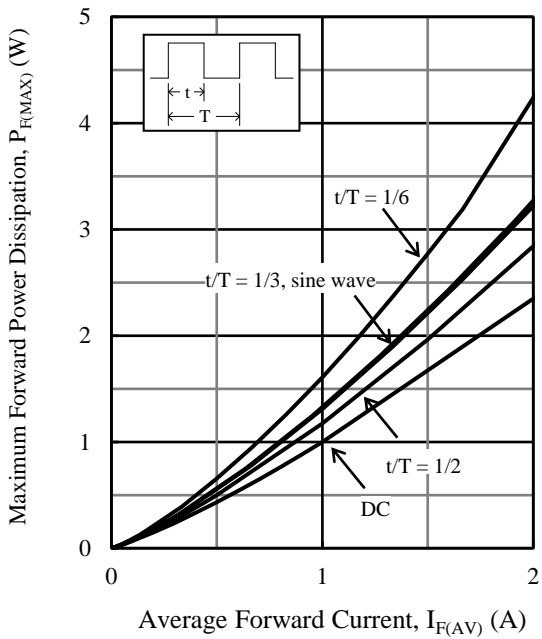


Figure 4.  $P_{F(MAX)}$  vs.  $I_{F(AV)}$  ( $T_J = 150\text{ }^\circ\text{C}$ )

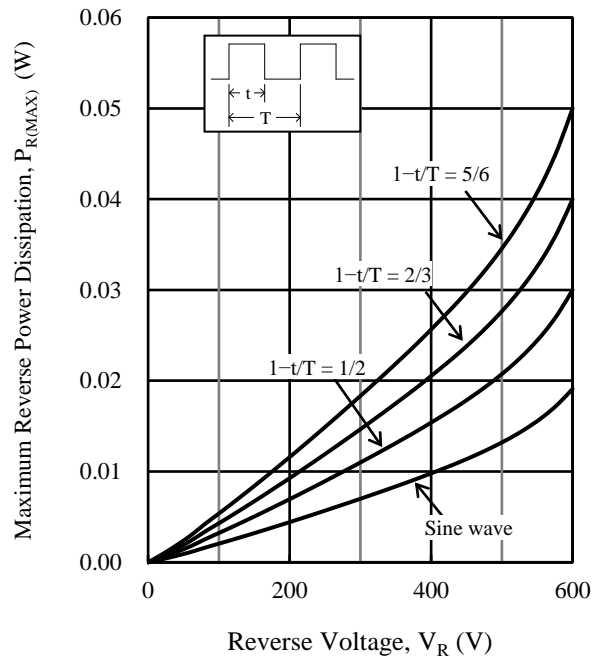


Figure 5.  $P_{R(MAX)}$  vs.  $V_R$  ( $T_J = 150\text{ }^\circ\text{C}$ )

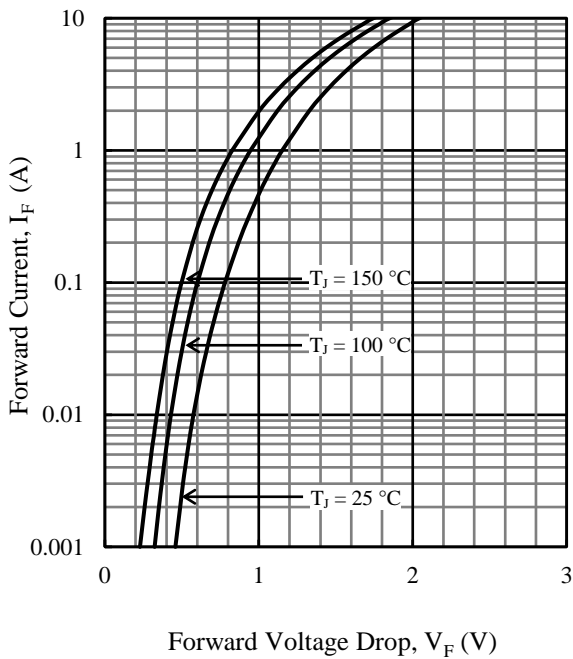


Figure 6. Typical Characteristics:  $I_F$  vs.  $V_F$

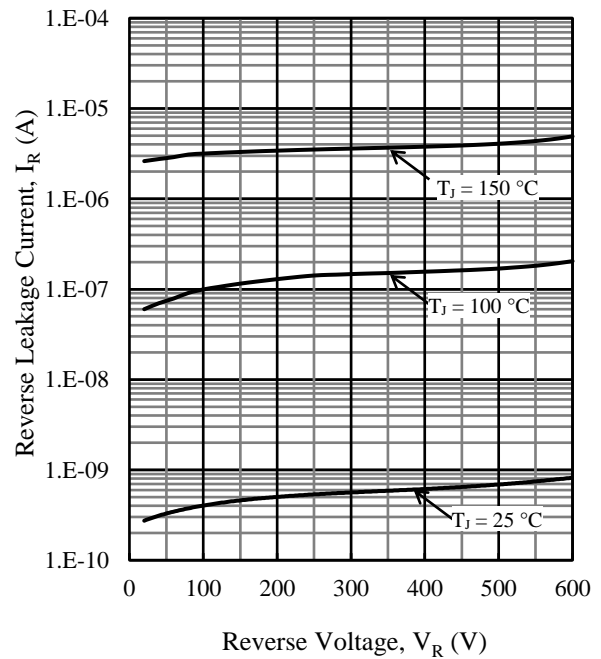


Figure 7. Typical Characteristics:  $I_R$  vs.  $V_R$

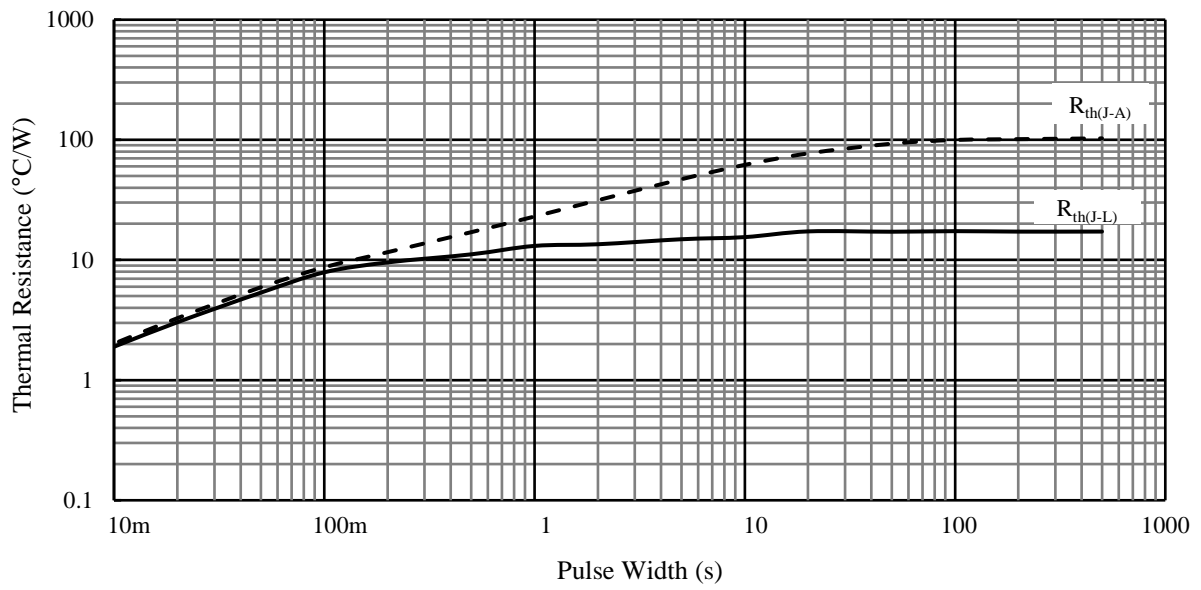
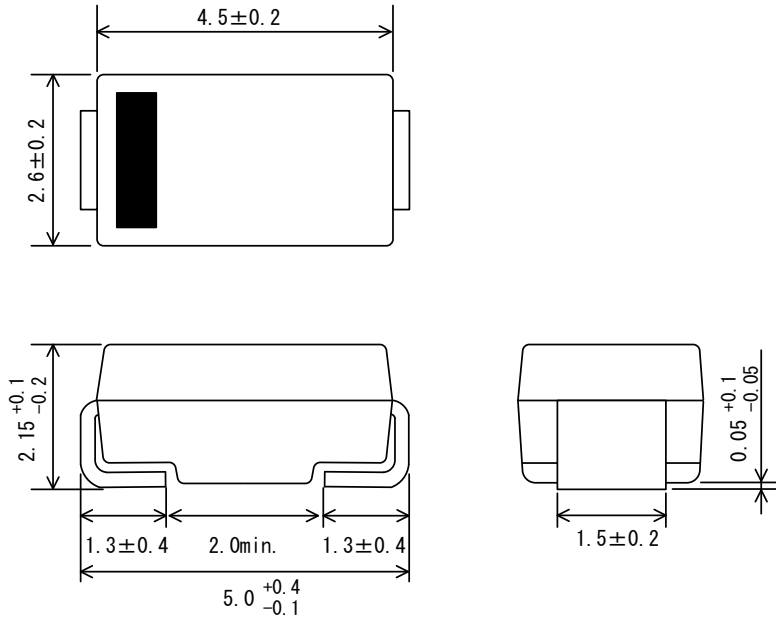


Figure 8. Typical Transient Thermal Resistance Characteristics

## SJPL-H6

### Physical Dimensions

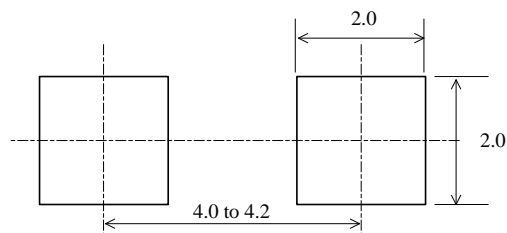
#### • SJP Package



#### NOTES:

- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- Moisture Sensitivity Level 1 (MSL 1)
- When soldering the products, it is required to minimize the working time within the following limits:
  - Flow: 260 °C / 10 s, 1 time
  - Reflow:
    - Preheat: 150 °C to 200 °C / 60 s to 120 s
    - Solder heating: 255 °C / 30s, 3 times (260 °C peak)
    - Soldering Iron: 350 °C / 3.5 s, 1 time

#### • SJP Land Pattern Example



#### NOTE:

- Dimensions in millimeters

**Marking Diagram**

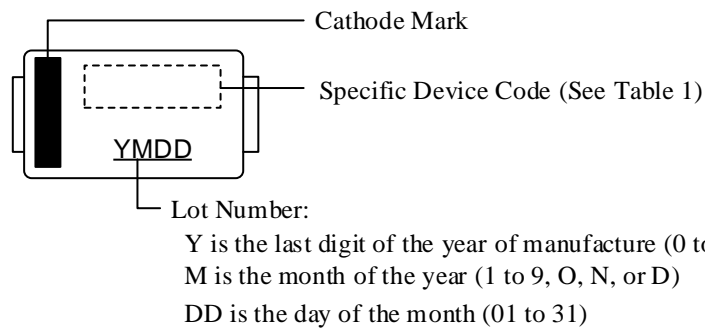


Table 1. Specific Device Code

| Specific Device Code | Part Number |
|----------------------|-------------|
| LH6                  | SJPL-H6     |

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