

**$V_{RM} = 400\text{ V}$ ,  $I_{F(AV)} = 3.0\text{ A}$ ,  $t_{rr} = 50\text{ ns}$**   
**Fast Recovery Diode**  
**SJPL-L4**

**Description**

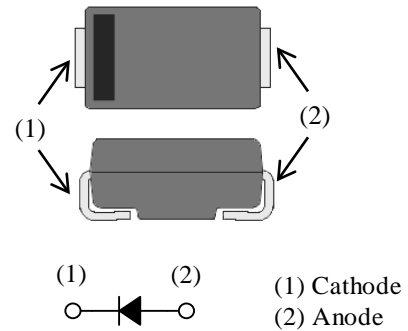
The SJPL-L4 is a fast recovery diode of 400 V / 3.0 A. The maximum  $t_{rr}$  of 50 ns is realized by optimizing a life-time control.

**Features**

- $V_{RM}$ ----- 400 V
- $I_{F(AV)}$ ----- 3.0 A
- $V_F$ ----- 1.3 V
- $t_{rr1}$ ----- 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**

- 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 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 | $V_{RSM}$   |   | 400        | V                    |
| Repetitive Peak Reverse Voltage    | $V_{RM}$    |   | 400        | V                    |
| Average Forward Current            | $I_{F(AV)}$ | See Figure 1 and Figure 2                             | 3.0        | A                    |
| Surge Forward Current              | $I_{FSM}$   | Half cycle sine wave,<br>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                           | $V_F$         | $T_J = 25\text{ }^{\circ}\text{C}$ , $I_F = 3.0\text{ A}$  | —    | —    | 1.3  | V                    |
|  |               | $T_J = 100\text{ }^{\circ}\text{C}$ , $I_F = 3.0\text{ A}$   | —    | 0.98 | —    | 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>              | $R_{th(J-C)}$ |  | —    | —    | 20   | $^{\circ}\text{C/W}$ |

<sup>(1)</sup>  $R_{th(J-C)}$  is thermal resistance between junction and case. Case temperature ( $T_C$ ) is measured near the root of pin.

## Rating and Characteristic Curves

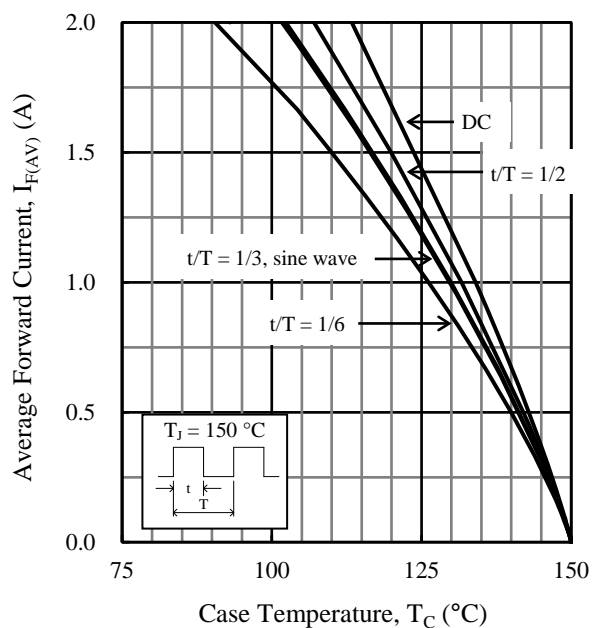


Figure 1. Typical Characteristics:  $I_{F(AV)}$  vs.  $T_C$  ( $V_R = 0$  V)

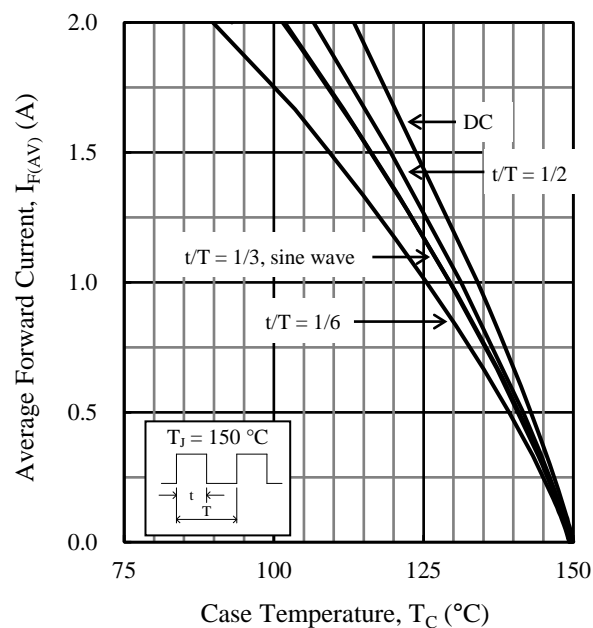


Figure 2. Typical Characteristics:  $I_{F(AV)}$  vs.  $T_C$  ( $V_R = 400$  V)

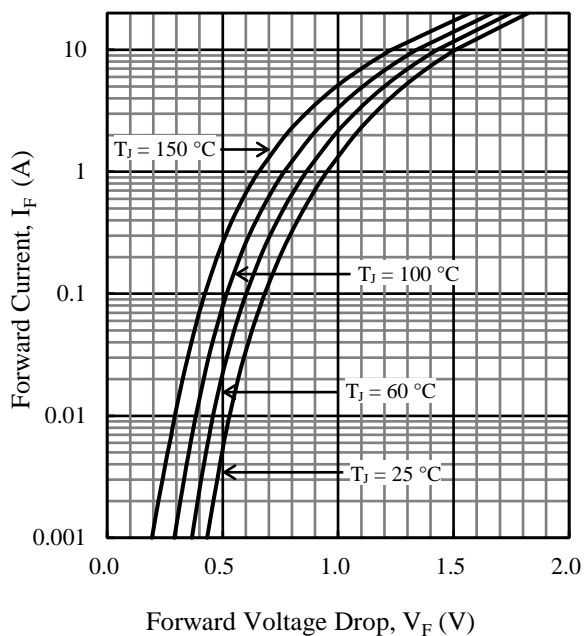


Figure 3. Typical Characteristics:  $I_F$  vs.  $V_F$

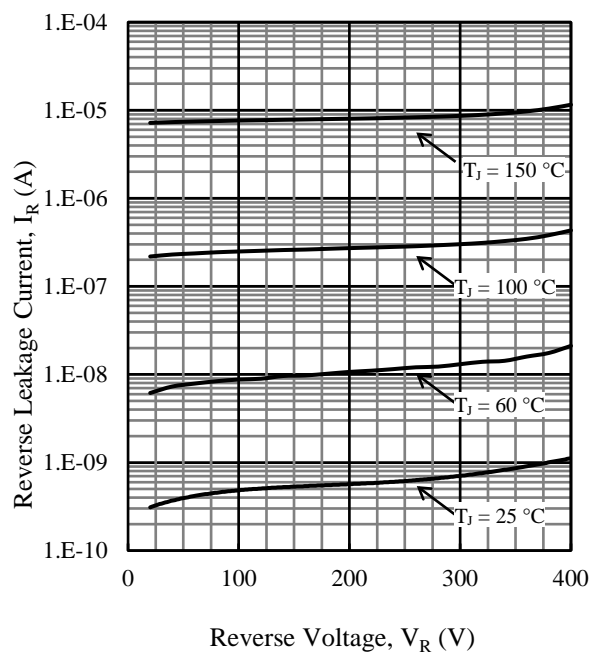
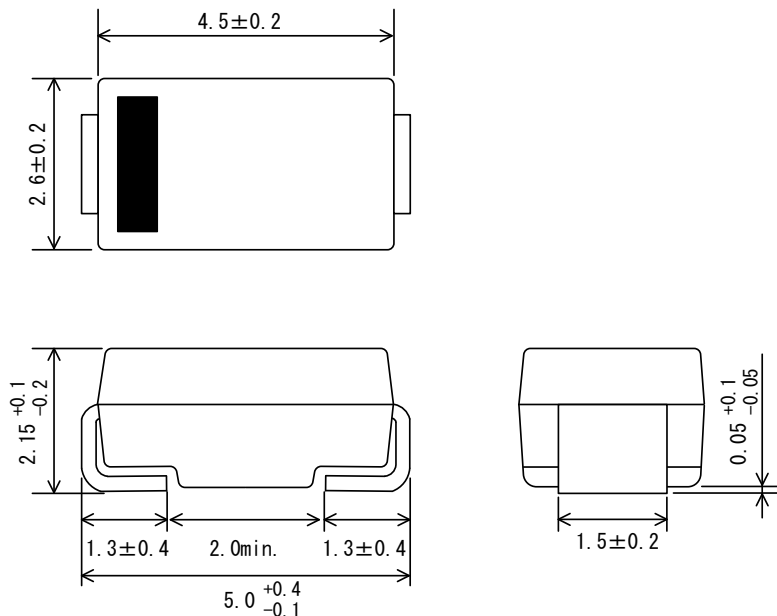


Figure 4. Typical Characteristics:  $I_R$  vs.  $V_R$

## SJPL-L4

### Physical Dimensions

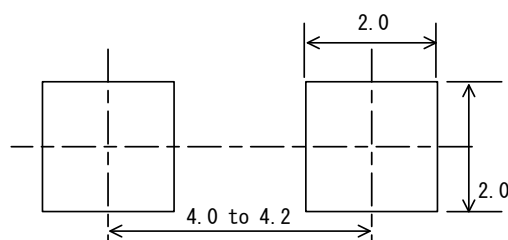
#### • SJP Package



#### NOTES:

- Dimensions in millimeters
- Bare lead frame: Pb-free (RoHS compliant)
- When soldering the products, it is required to minimize the working time within the following limits:
  - Flow:  $260 \pm 5 \text{ }^{\circ}\text{C} / 10 \pm 1 \text{ s}$ , 2 times
  - Soldering Iron:  $380 \pm 10 \text{ }^{\circ}\text{C} / 3.5 \pm 0.5 \text{ s}$ , 1 time
- MSL: JEDEC LEVEL1

#### • SJP Land Pattern Example



#### NOTE:

- Dimensions in millimeters

## Marking Diagram

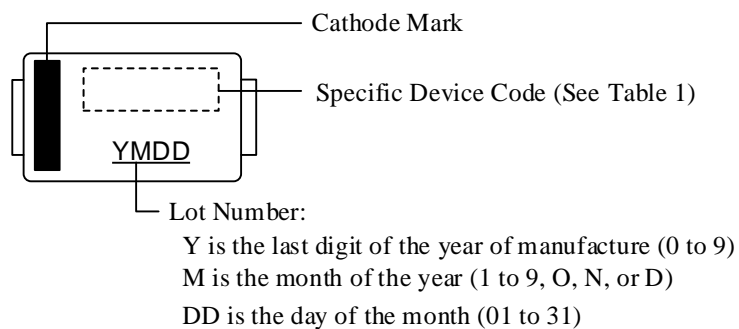


Table 1. Specific Device Code

| Specific Device Code | Part Number |
|----------------------|-------------|
| LL4                  | SJPL-L4     |

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DSGN-AEZ-16003