

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

**Description**

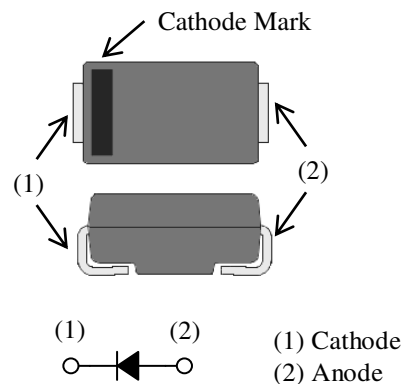
The SJPL-L4 is a fast recovery diode of 400 V / 3.0 A. The maximum  $t_{rr}$  of 50 ns is realized by optimizing a life-time control.

**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 2 and Figure 3	3.0	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	$V_F$	$T_J = 25\text{ }^\circ\text{C}$ , $I_F = 3.0\text{ A}$	—	—	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	$t_{rr1}$	$I_F = I_{RP} = 100\text{ mA}$ , 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	50	ns
	$t_{rr2}$	$I_F = 100\text{ mA}$ , $I_{RP} = 200\text{ mA}$ , 75% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	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

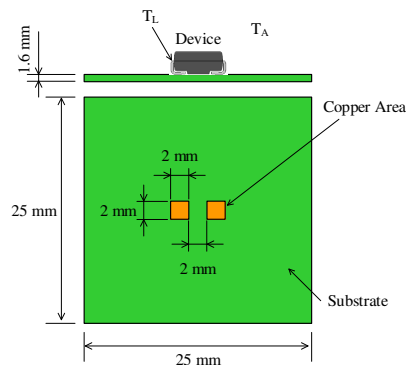


Figure 1. Lead Temperature Measurement Conditions

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

Derating Curves

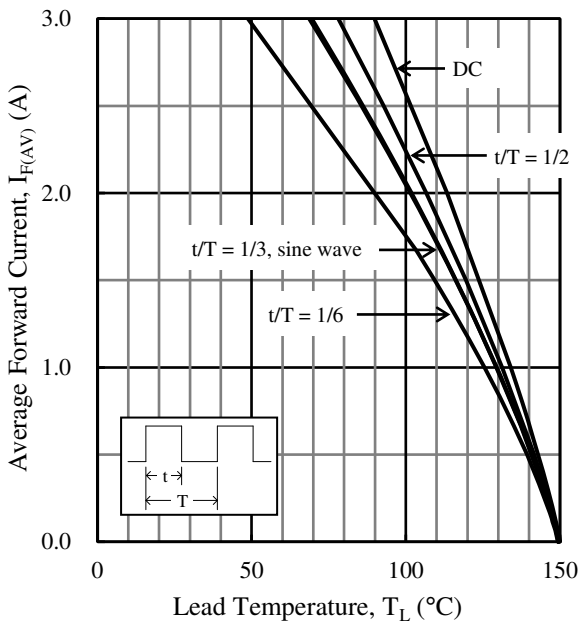


Figure 2.  $I_{F(AV)}$  vs.  $T_L$  ( $T_J = 150\text{ }^\circ\text{C}$ ,  $V_R = 0\text{ V}$ )

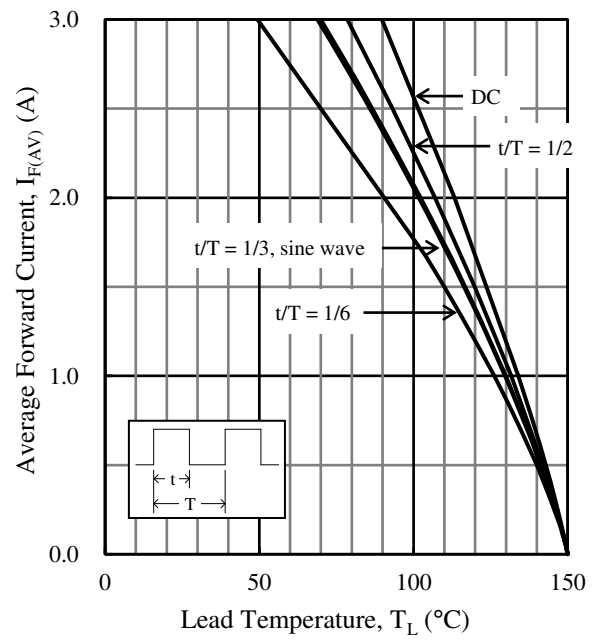


Figure 3.  $I_{F(AV)}$  vs.  $T_L$  ( $T_J = 150\text{ }^\circ\text{C}$ ,  $V_R = 400\text{ V}$ )

Characteristic Curves

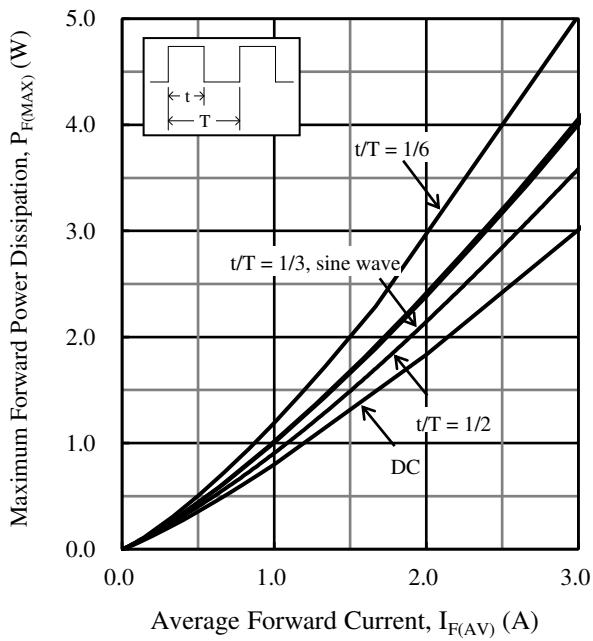


Figure 4.  $P_{F(MAX)}$  vs.  $I_{F(AV)}$  ( $T_J = 150\text{ }^\circ\text{C}$ )

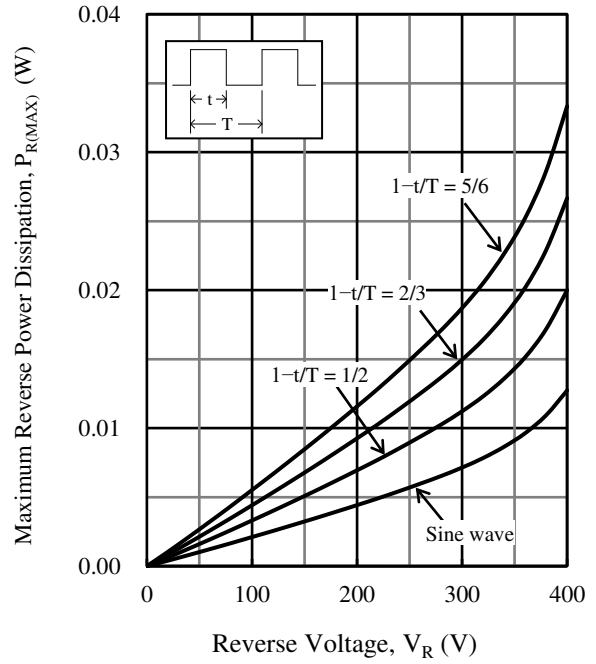


Figure 5.  $P_{R(MAX)}$  vs.  $V_R$  ( $T_J = 150\text{ }^\circ\text{C}$ )

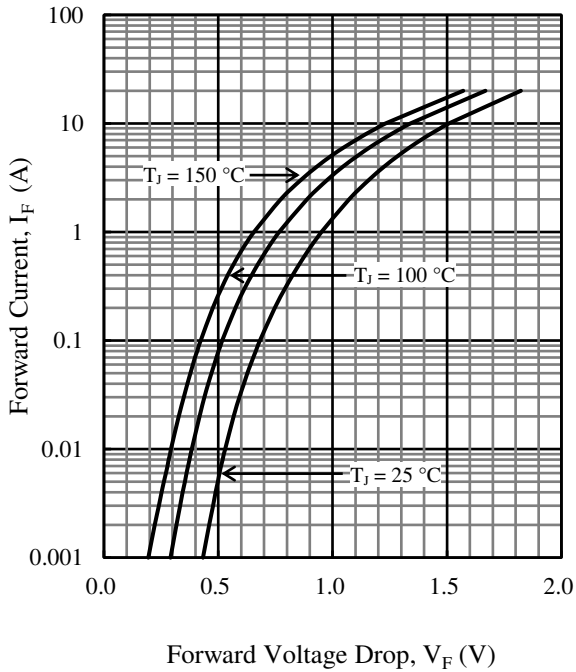


Figure 6. Typical Characteristics:  $I_F$  vs.  $V_F$

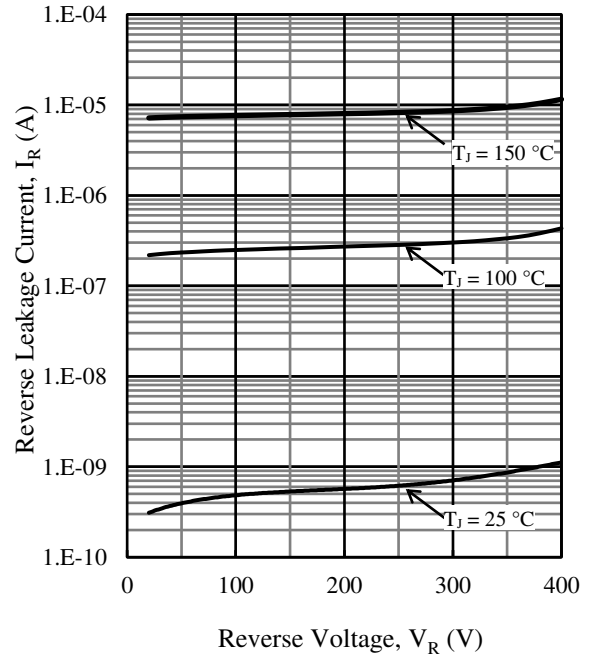


Figure 7. Typical Characteristics:  $I_R$  vs.  $V_R$

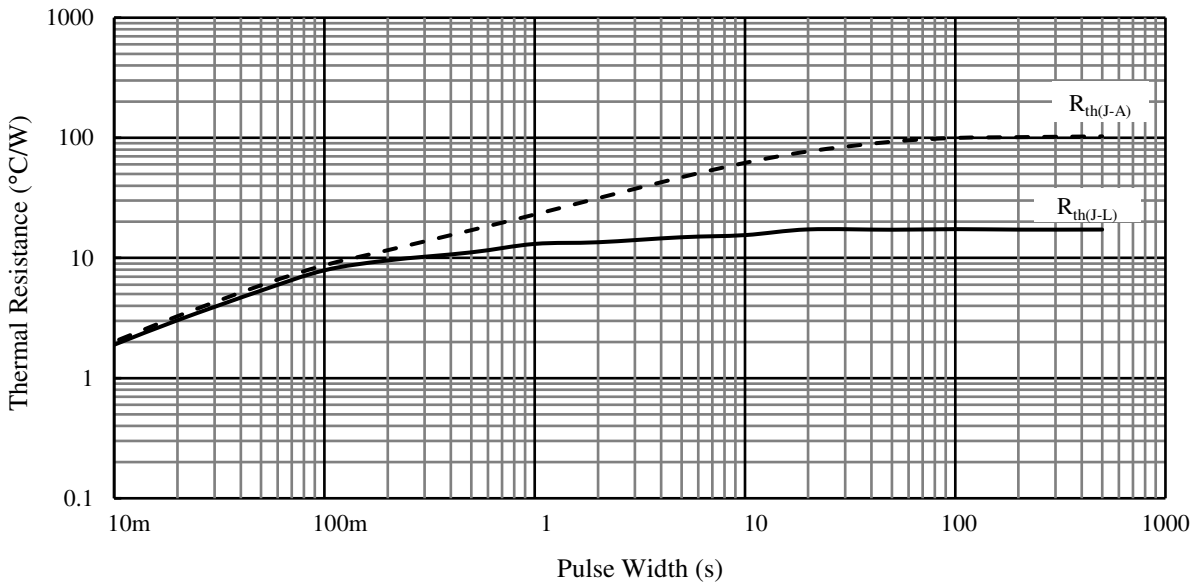
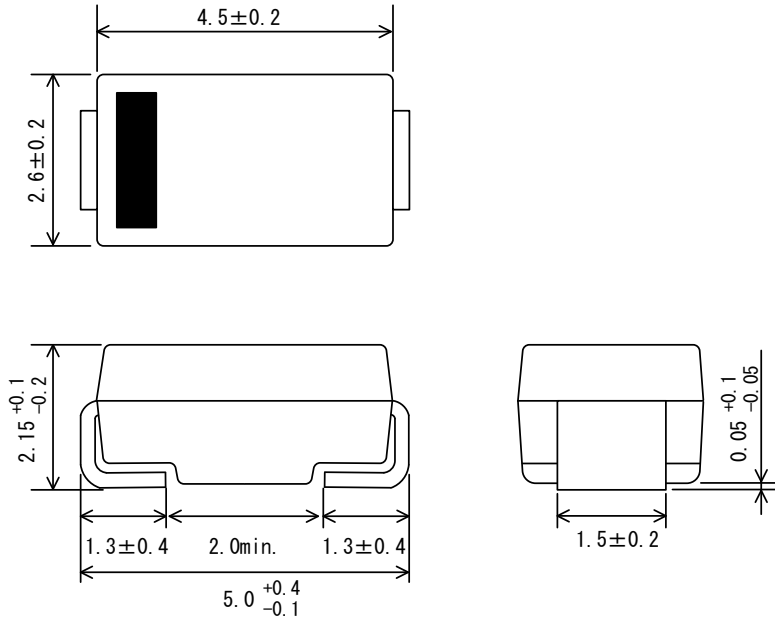


Figure 8. Typical Transient Thermal Resistance Characteristics

# SJPL-L4

## Physical Dimensions

### • SJP Package



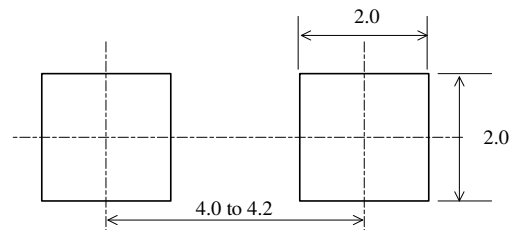
### NOTES:

- 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

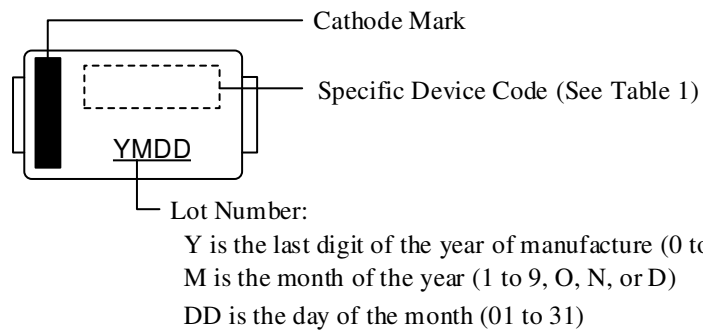


Table 1. Specific Device Code

Specific Device Code	Part Number
LL4	SJPL-L4

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