

$V_{RM} = 500\text{ V}$, $I_{F(AV)} = 1.0\text{ A}$, $t_{rr} = 40\text{ ns}$
Fast Recovery Diode
SJPD-D5

Description

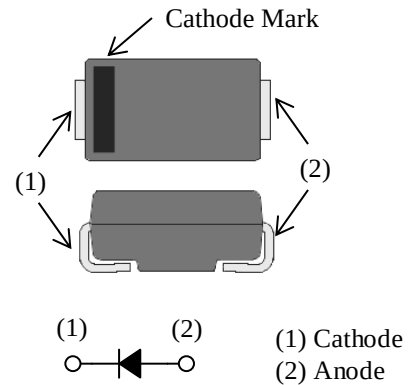
The SJPD-D5 is a fast recovery diode of 500 V / 1.0 A. The maximum t_{rr} of 40 ns is realized by optimizing a life-time control.

Features

- V_{RM} ----- 500 V
- $I_{F(AV)}$ ----- 1.0 A
- V_F ----- 1.4 V
- t_{rr1} ----- 40 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}		500	V
Repetitive Peak Reverse Voltage	V_{RM}		500	V
Average Forward Current	$I_{F(AV)}$	See Figure 2 and Figure 3	1.0	A
Surge Forward Current	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	20	A
I^2t Limiting Value	I^2t	$1\text{ ms} \leq t \leq 10\text{ ms}$	2.0	A^2s
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	$T_J = 25\text{ }^{\circ}\text{C}$, $I_F = 1.0\text{ A}$	—	—	1.4	V
		$T_J = 100\text{ }^{\circ}\text{C}$, $I_F = 1.0\text{ A}$	—	1.0	—	V
Reverse Leakage Current	I_R	$V_R = V_{RM}$	—	—	10	μA
Reverse Leakage Current under High Temperature	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^{\circ}\text{C}$	—	—	100	μA
Reverse Recovery Time	t_{rr1}	$I_F = I_{RP} = 100\text{ mA}$, 90% recovery point, $T_J = 25\text{ }^{\circ}\text{C}$	—	—	40	ns
	t_{rr2}	$I_F = 100\text{ mA}$, $I_{RP} = 200\text{ mA}$, 75% recovery point, $T_J = 25\text{ }^{\circ}\text{C}$	—	—	30	ns
Thermal Resistance ⁽¹⁾	$R_{th(J-L)}$		—	—	20	$^{\circ}\text{C/W}$

Mechanical Characteristics

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

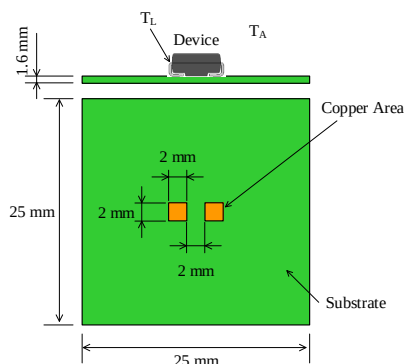


Figure 1. Lead Temperature Measurement Conditions

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

Derating Curves

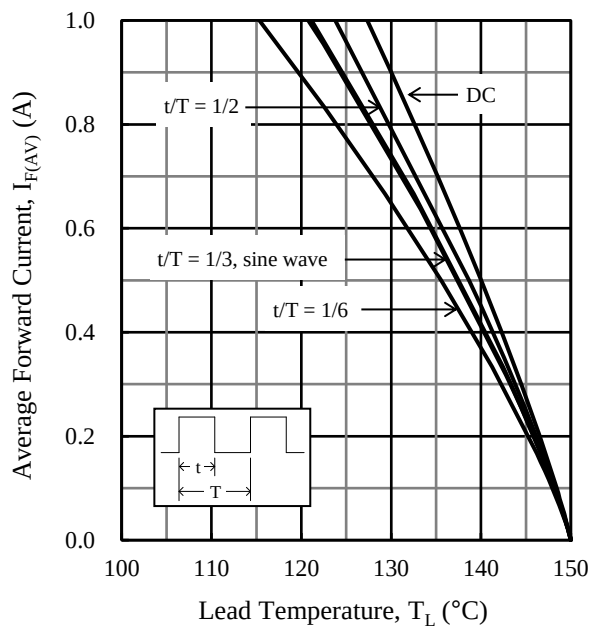


Figure 2. $I_{F(AV)}$ vs. T_L ($T_J = 150$ °C, $V_R = 0$ V)

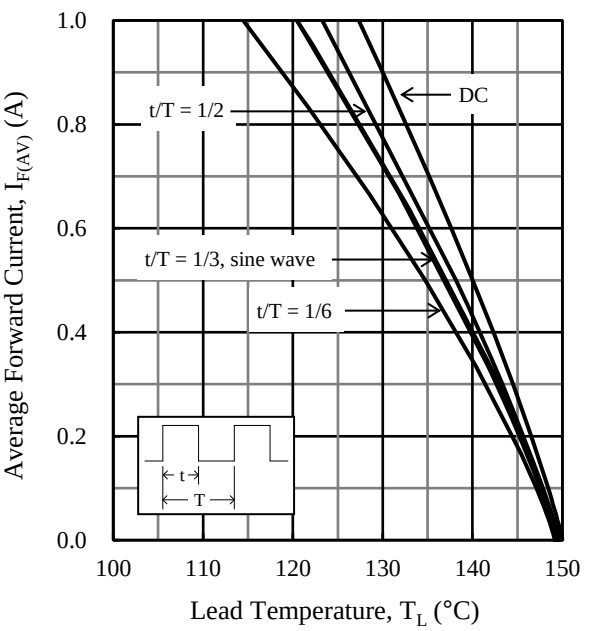
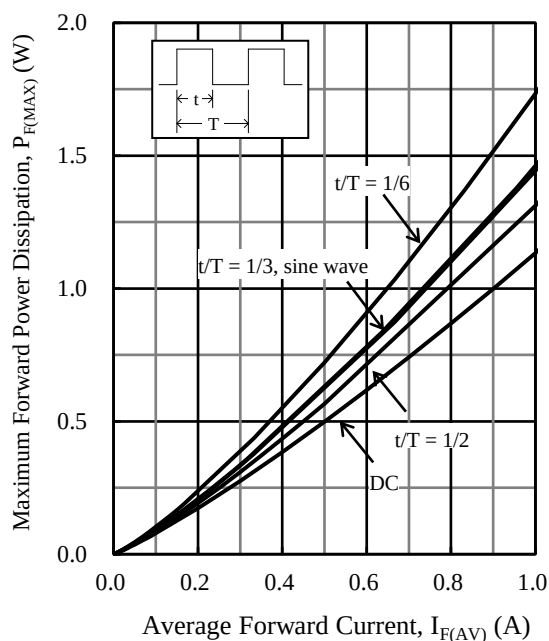
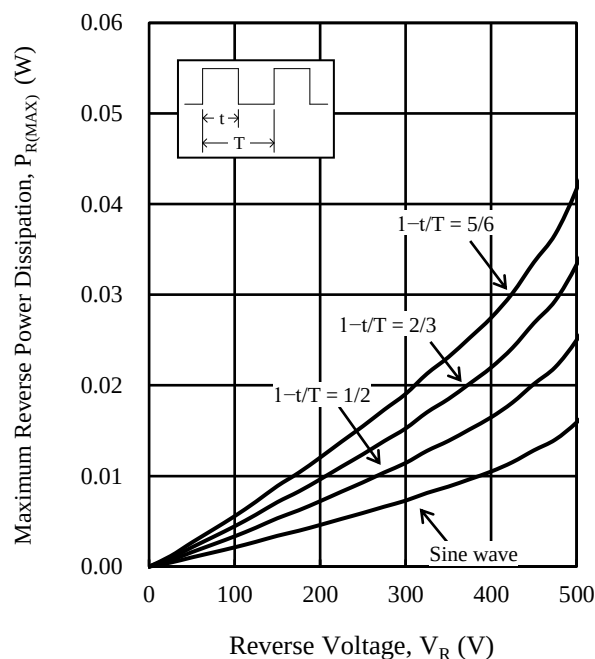
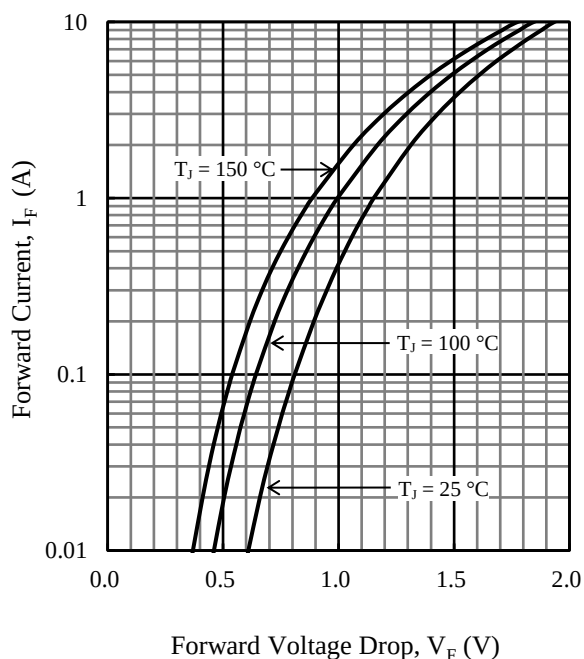
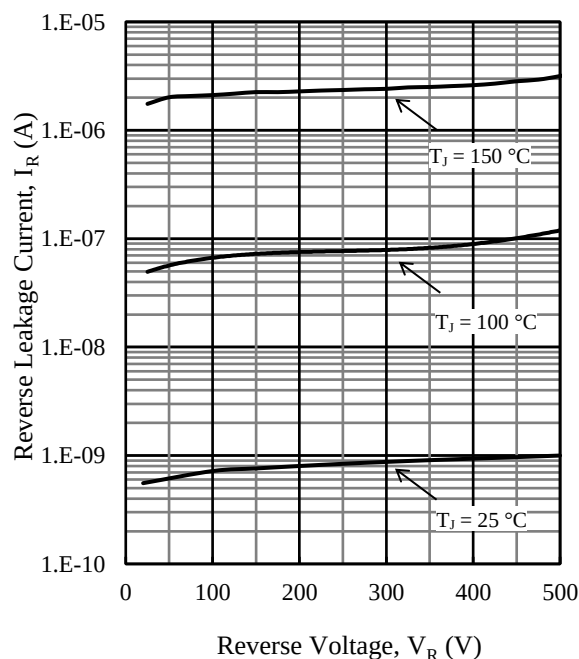


Figure 3. $I_{F(AV)}$ vs. T_L ($T_J = 150$ °C, $V_R = 500$ V)

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

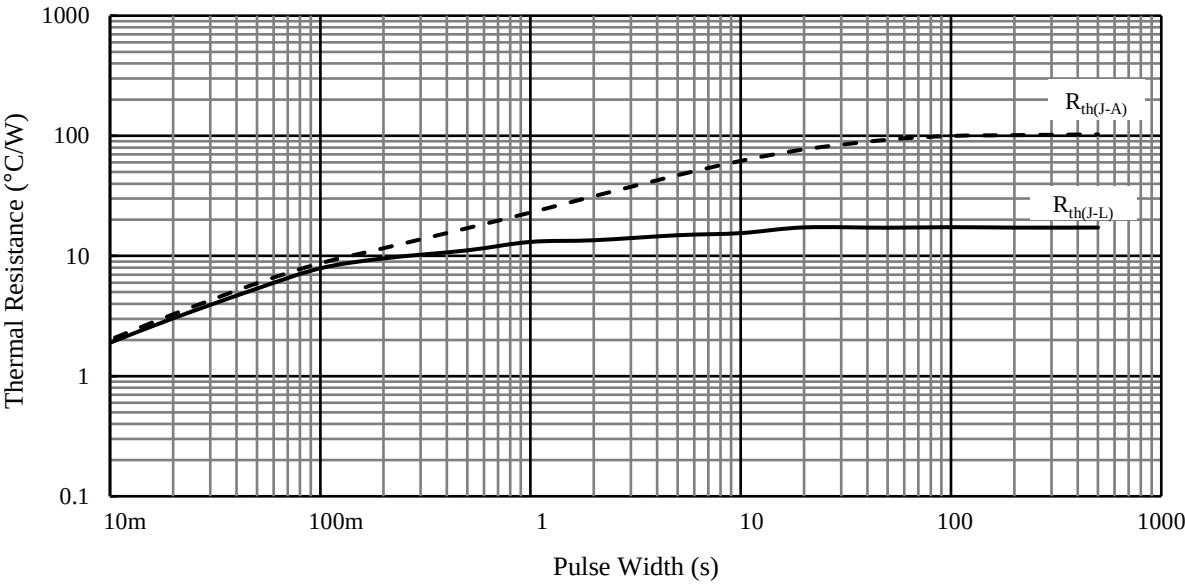
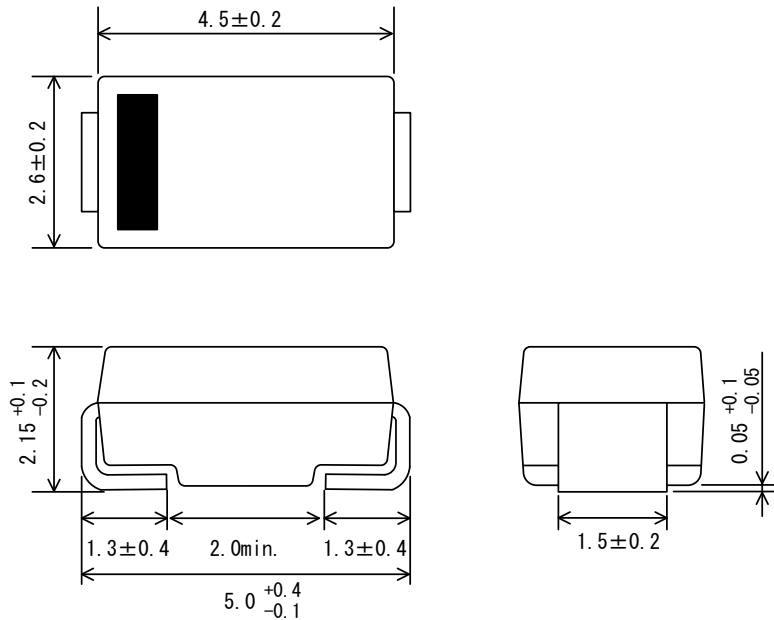


Figure 8. Typical Transient Thermal Resistance Characteristics

Physical Dimensions

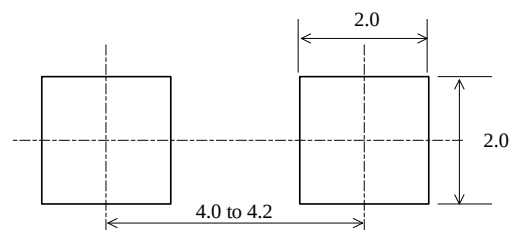
• SJP Package



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

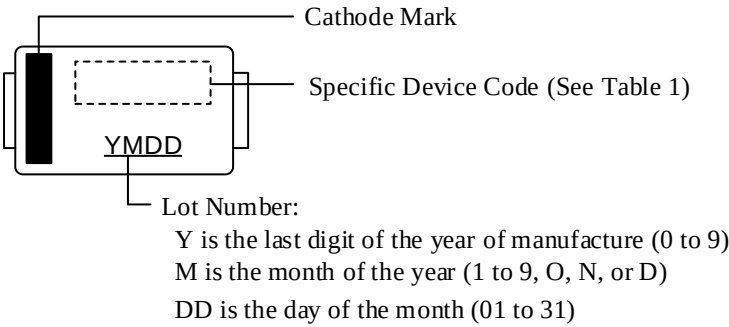


Table 1. Specific Device Code

Specific Device Code	Part Number
DD5	SJPD-D5

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