V_{RM} = 200 V, $I_{F(AV)}$ = 10 A, t_{rr} = 30 ns
Fast Recovery Diode

SPXS-2102S

Data Sheet

Description

The SPXS-2102S is a fast recovery diode of 200 V / 10 A. The maximum t_{rr} of 30 ns is realized by optimizing a life-time control. The low thermal resistance package achieves high performance in terms of heat dissipation.

Features

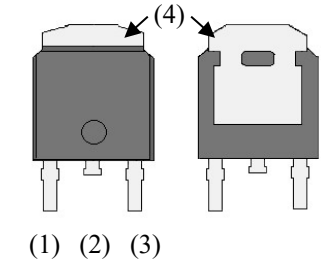
- V_{RM} ---------- 200 V
- $I_{F(AV)}$ ---------- 10 A
- V_F ---------- 1.25 V
- t_{rr1} ---------- 30 ns
- Bare Leads: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0
- Flow Soldering Available (MSL 1)

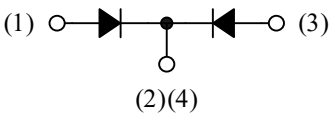
Applications

- Secondary-side Rectifier Diode
  (Flyback Converter, LLC Converter, etc.)
- Freewheel Diode
  (Offline Buck Converter, Offline Buck-boost Converter, etc.)

Package

TO252-2L





(1) Anode
(2) Cathode
(3) Anode
(4) Cathode

Not to scale

Absolute Maximum Ratings

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Rating	Unit
Nonrepetitive Peak Reverse Voltage(1)	V_{RSM}		200	V
Repetitive Peak Reverse Voltage(1)	V_{RM}		200	V
Average Forward Current	$I_{F(AV)}$	See Figure 3 and Figure 4	10	A
Surge Forward Current(1)	I_{FSM}	Half cycle sine wave, positive side, 10 ms, 1 shot	65	A
I^2t Limiting Value(1)	I^2t	1 ms ≤ t ≤ 10 ms	21	A^2s
Junction Temperature	T_J		−40 to 150	°C
Storage Temperature	T_{STG}		−40 to 150	°C

Electrical Characteristics

Unless otherwise specified, T_A = 25 °C.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop(1)	V_F	T_J = 25 °C, I_F = 5.0 A	—	—	1.25	V
		T_J = 100 °C, I_F = 5.0 A	—	0.82	—	V
Reverse Leakage Current(1)	I_R	$V_R = V_{RM}$	—	—	50	μA
Reverse Leakage Current under High Temperature(1)	$H \cdot I_R$	$V_R = V_{RM}$, T_J = 150 °C	—	—	10	mA
Reverse Recovery Time(1)	t_{rr1}	$I_F = I_{RP}$ = 100 mA, 90% recovery point, T_J = 25 °C	—	—	30	ns
	t_{rr2}	I_F = 100 mA, I_{RP} = 200 mA, 75% recovery point, T_J = 25 °C	—	—	25	ns
Thermal Resistance (2)	$R_{th(J-C)}$	(3)	—	—	5.0	°C/W

Mechanical Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Package Weight		—	0.32	—	g

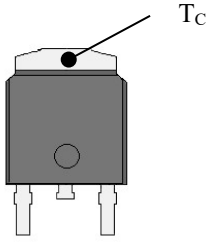


Figure 1. Case Temperature Measurement Point

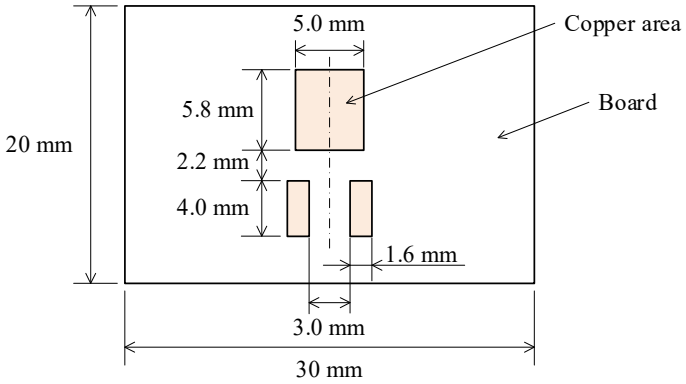


Figure 2. Glass-epoxy Board

(1) Specifies a value per chip; the SPXS-2102S consists of two chips.
(2) Refers to thermal resistance between junction and the case.
(3) The device is mounted on the glass-epoxy board (PCB: 42 mm × 32 mm in size, 1 mm in thickness, copper area: see Figure 2).

Derating Curves

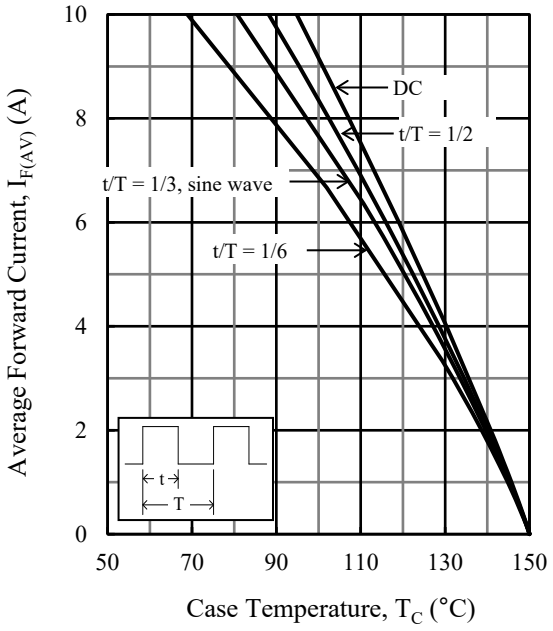


Figure 3. $I_{F(AV)}$ vs. T_C (T_J = 150 °C, V_R = 0 V)

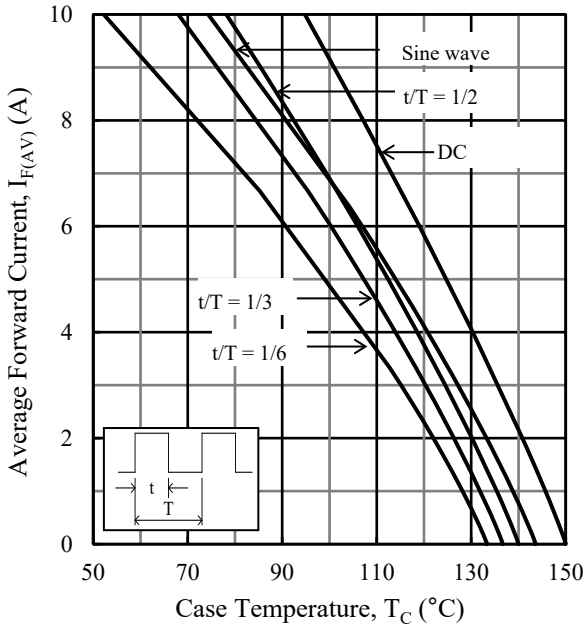


Figure 4. $I_{F(AV)}$ vs. T_C (T_J = 150 °C, V_R = 200 V)

Characteristic Curves

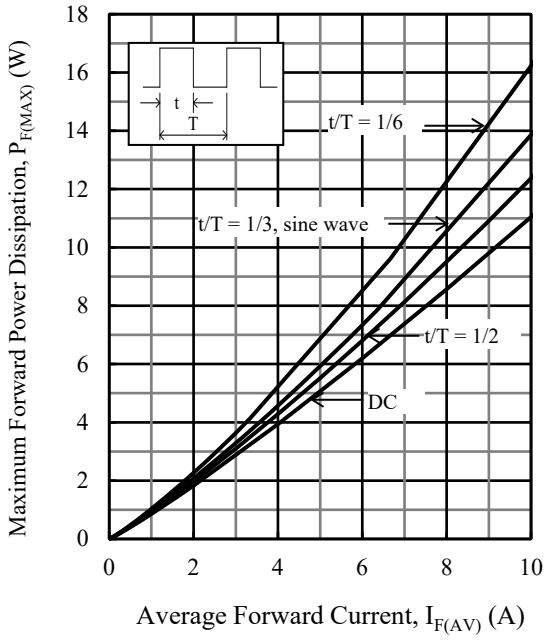


Figure 5. $P_{F(MAX)}$ vs. $I_{F(AV)}$ (T_J = 150 °C)

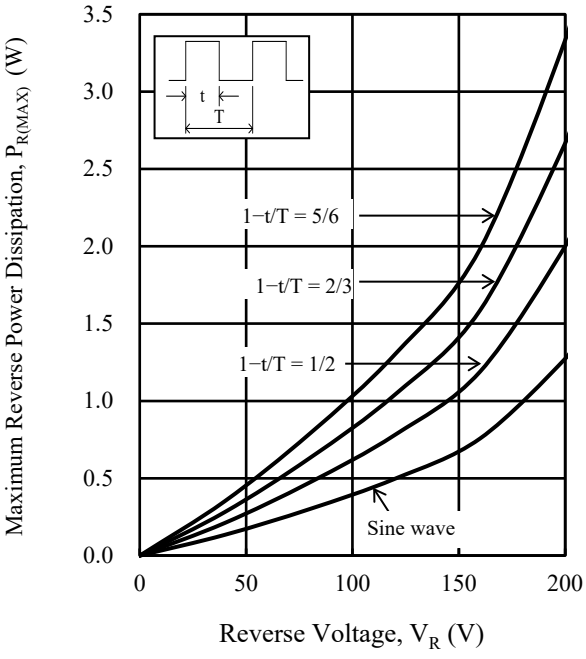


Figure 6. $P_{R(MAX)}$ vs. V_R (T_J = 150 °C)

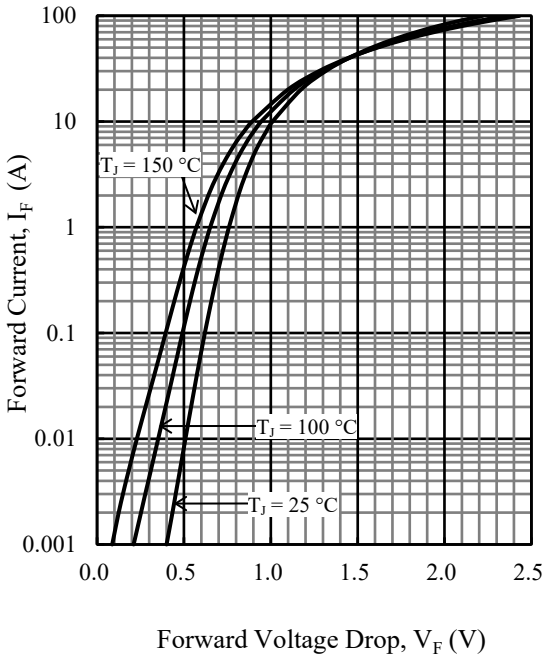


Figure 7. Typical Characteristics: I_F vs. V_F

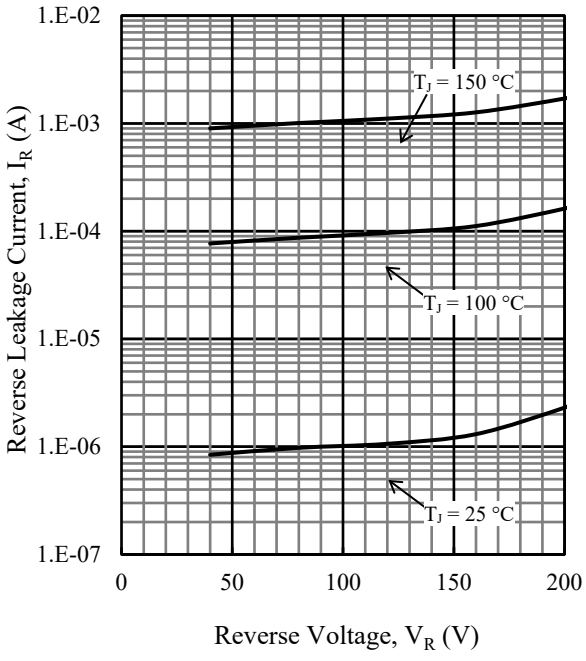


Figure 8. Typical Characteristics: I_R vs. V_R

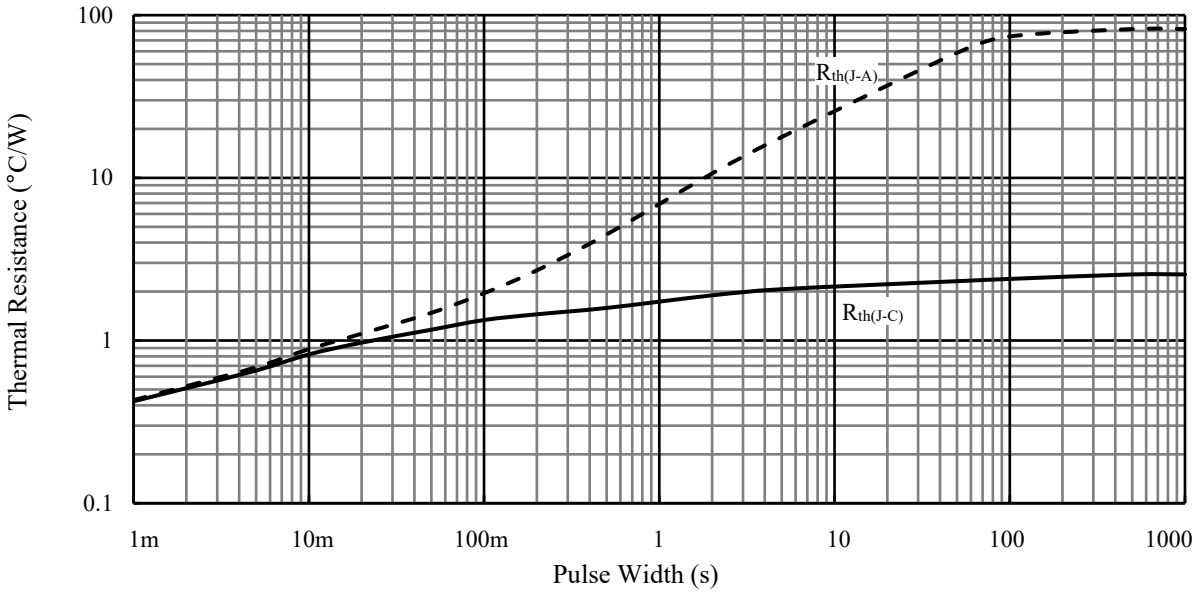
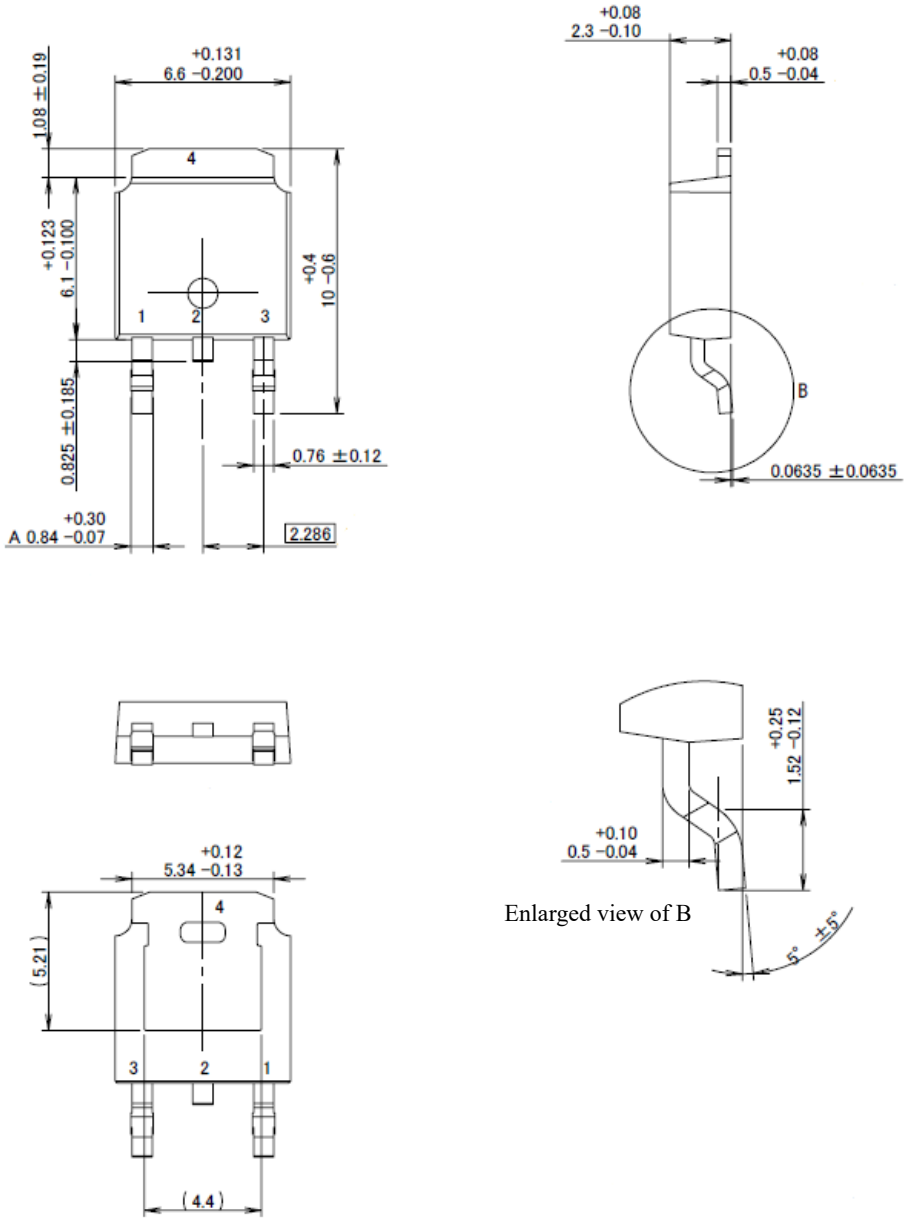


Figure 9. Typical Transient Thermal Resistance Characteristics

Physical Dimensions

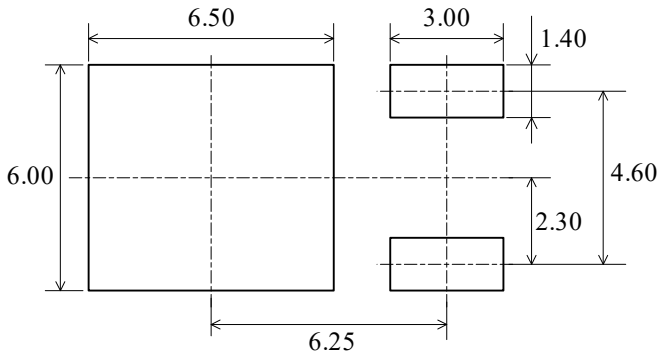
● **TO252-2L Package**



NOTES:

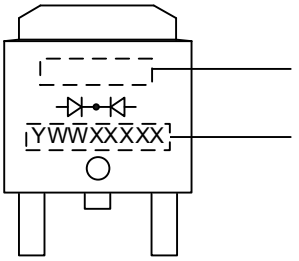
- Dimensions in millimeters
- All the dimensions exclude mold flashes, protrusions, and gate burrs.
- Bare lead frame: Pb-free (RoHS compliant)
- Moisture Sensitivity Level 1 (MSL 1)
- When soldering the products, it is required to minimize the working time within the following limits:
  Flow: 260 °C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

● **TO252-2L Land Pattern Example**



Dimensions in millimeters

Marking Diagram



Specific Device Code (See Table 1)

Lot Number:
Y is the last digit of the year of manufacture (0 to 9)
WW is the week number (01 to 53)
XXXXX is the control number

Table 1. Specific Device Code

Specific Device Code	Part Number
XS2102	SPXS-2102S

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