

$V_{RM} = 200\text{ V}$, $I_{F(AV)} = 10\text{ A}$, $t_{rr} = 30\text{ ns}$
Fast Recovery Diode
SPXS-2102S

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

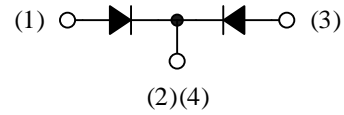
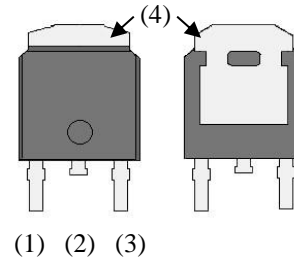
- V_{RM} -----200 V
- $I_{F(AV)}$ -----10 A
- V_F -----1.25 V
- t_{rr1} -----30 ns
- Bare Leads: Pb-free (RoHS Compliant)
- Flammability: Equivalent to UL94V-0

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

SPXS-2102S

Absolute Maximum Ratings

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

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	$1\text{ ms} \leq t \leq 10\text{ ms}$	21	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 ⁽¹⁾	V_F	$T_J = 25\text{ }^\circ\text{C}$, $I_F = 5.0\text{ A}$	—	—	1.25	V
		$T_J = 100\text{ }^\circ\text{C}$, $I_F = 5.0\text{ A}$	—	0.82	—	V
Reverse Leakage Current ⁽¹⁾	I_R	$V_R = V_{RM}$	—	—	50	μA
Reverse Leakage Current under High Temperature ⁽¹⁾	$H \cdot I_R$	$V_R = V_{RM}$, $T_J = 150\text{ }^\circ\text{C}$	—	—	10	mA
Reverse Recovery Time ⁽¹⁾	t_{rr1}	$I_F = I_{RP} = 100\text{ mA}$, 90% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	30	ns
		$I_F = 100\text{ mA}$, $I_{RP} = 200\text{ mA}$, 75% recovery point, $T_J = 25\text{ }^\circ\text{C}$	—	—	25	ns
Thermal Resistance ⁽²⁾	$R_{th(J-C)}$	⁽³⁾	—	—	5.0	$^\circ\text{C/W}$

Mechanical Characteristics

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

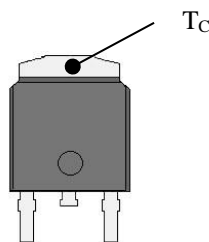


Figure 1. Case Temperature Measurement Point

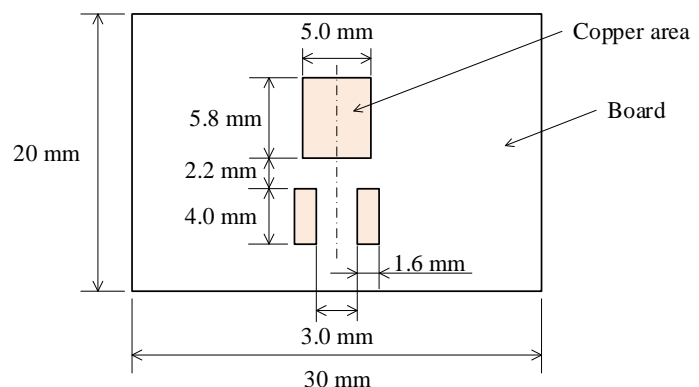


Figure 2. Glass-epoxy Board

⁽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

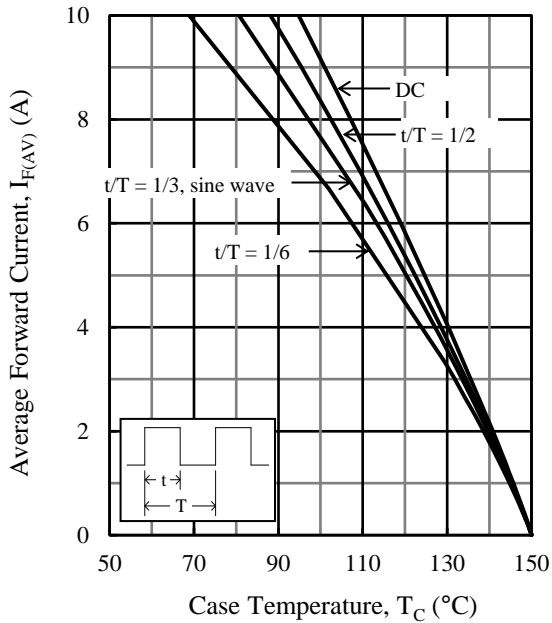


Figure 3. $I_{F(AV)}$ vs. T_C ($T_J = 150$ °C, $V_R = 0$ V)

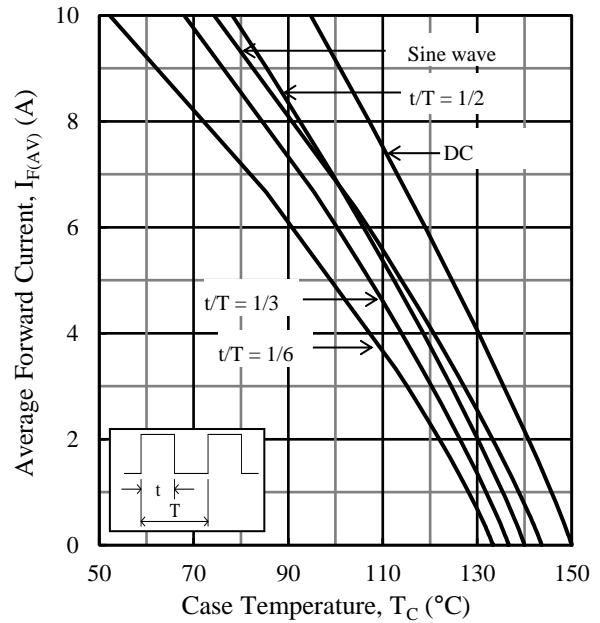


Figure 4. $I_{F(AV)}$ vs. T_C ($T_J = 150$ °C, $V_R = 200$ V)

Characteristic Curves

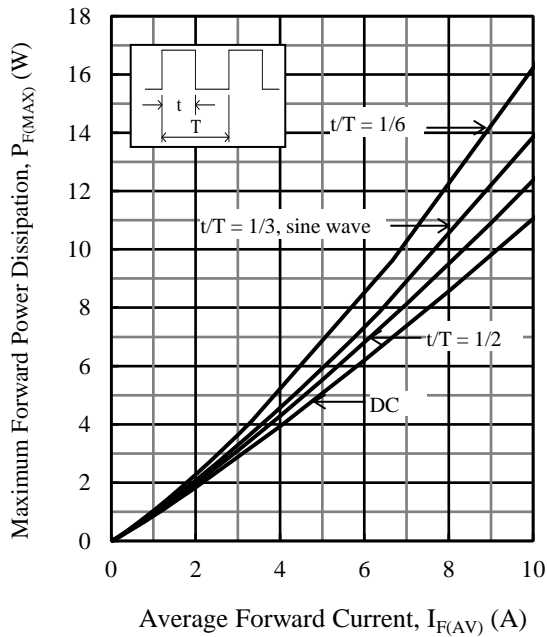


Figure 5. $P_{F(MAX)}$ vs. $I_{F(AV)}$ ($T_J = 150$ °C)

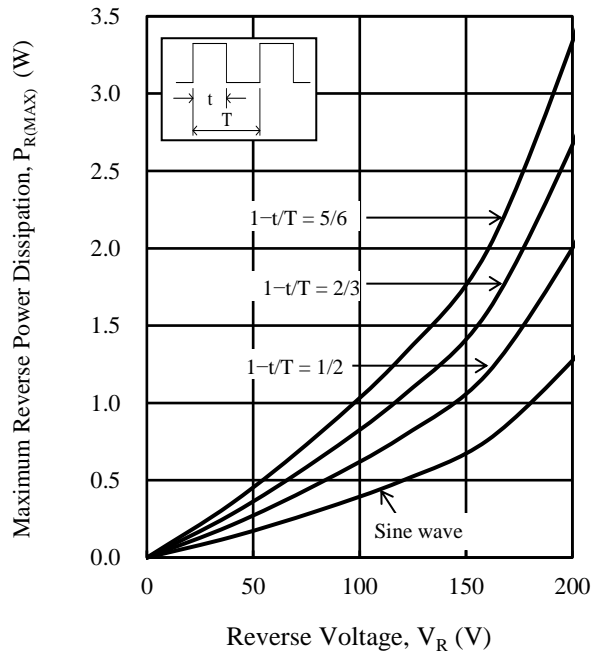


Figure 6. $P_{R(MAX)}$ vs. V_R ($T_J = 150$ °C)

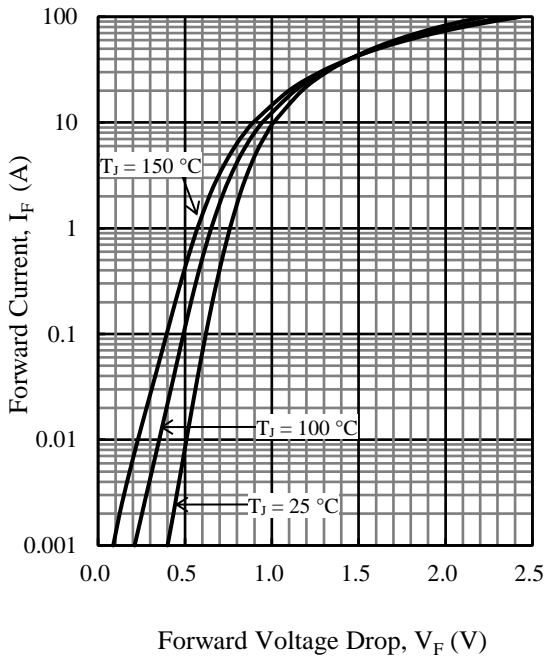


Figure 7. Typical Characteristics: I_F vs. V_F

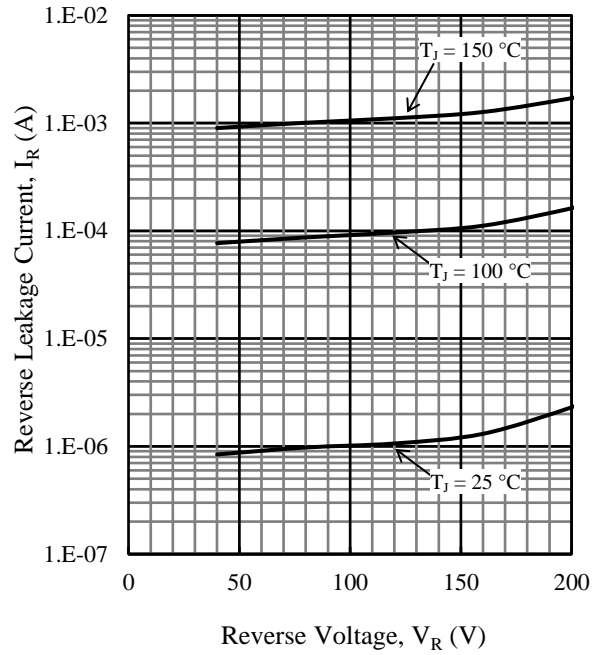


Figure 8. Typical Characteristics: I_R vs. V_R

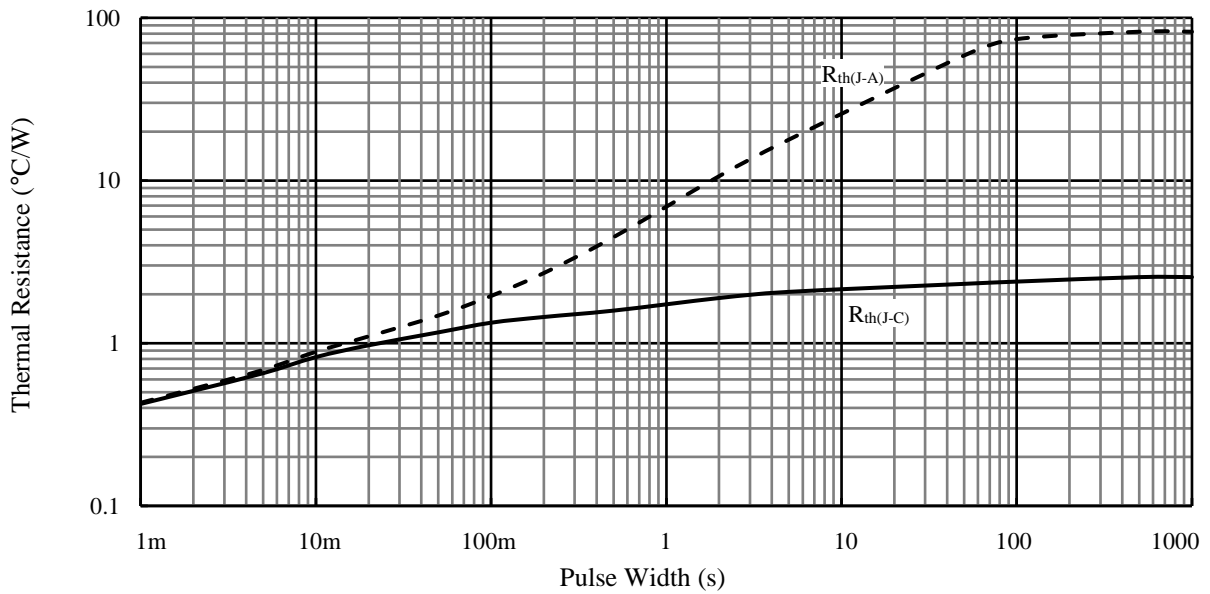
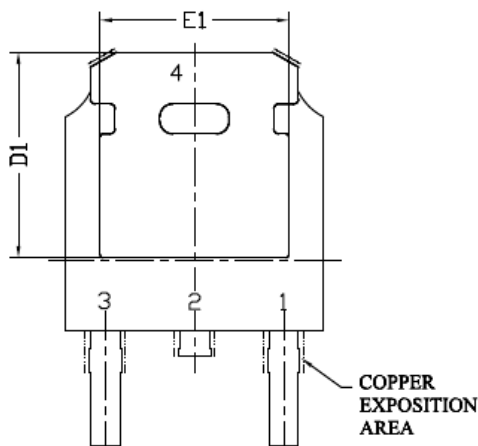
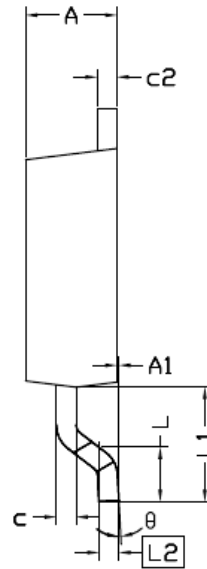
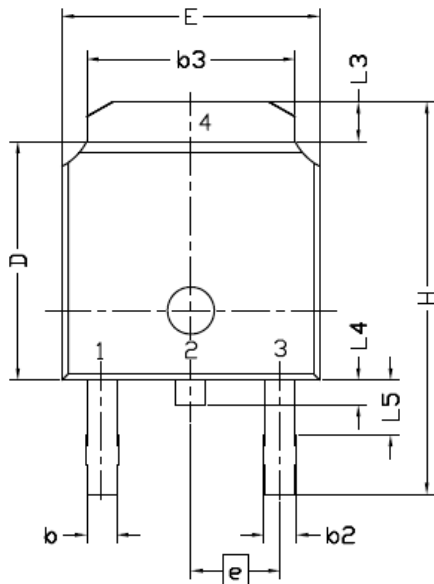


Figure 9. Typical Transient Thermal Resistance Characteristics

SPXS-2102S

Physical Dimensions

• TO252-2L Package



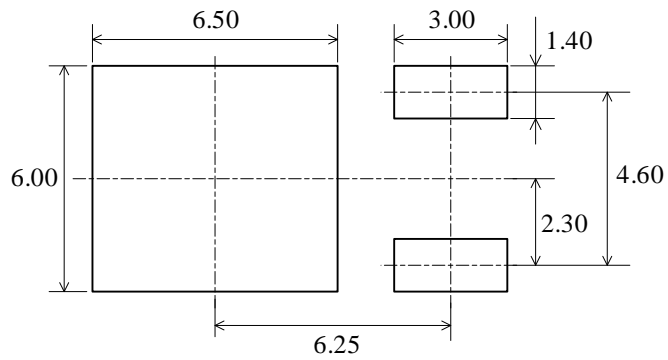
Symbol	Dimensions		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1	2.743 (REF)		
L2	0.508 (BSC)		
L3	0.89	—	1.27
L4	0.64	—	1.01
L5	—	—	—
D	6.00	6.10	6.223
H	9.40	10.00	10.40
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
e	2.286 (BSC)		
A	2.20	2.30	2.38
A1	0	—	0.127
c	0.46	0.50	0.60
c2	0.46	0.50	0.58
D1	5.21	—	—
E1	4.40	—	—
θ	0°	—	10°

NOTES:

- Dimensions in millimeters
- All the dimensions exclude mold flashes.
- 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, 2 times (260 °C peak)
 Soldering Iron: 350 °C / 3.5 s, 1 time

SPXS-2102S

• T0252-2L Land Pattern Example



Dimensions in millimeters

Marking Diagram

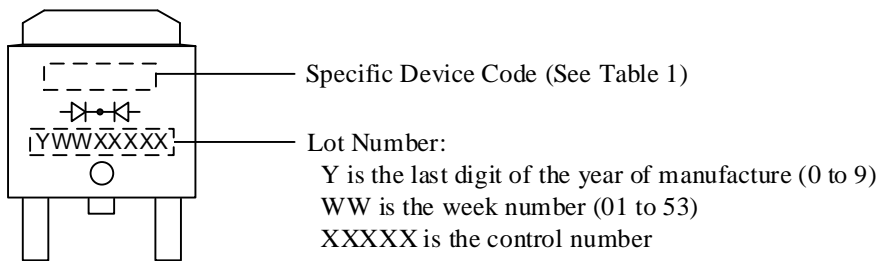


Table 1. Specific Device Code

Specific Device Code	Part Number
XS2102	SPXS-2102S

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DSGN-CEZ-16003