

# High Efficiency Snubber Diode

## Features and Benefits

- High Peak Reverse Voltage,  $V_{RM}$ : 800 V
- Low Forward Voltage,  $V_F$ : 0.92 V (max) at  $I_F = 1.2$  A
- Peak Forward Surge Current,  $I_{FSM}$ : 110 A
- Average Forward Current,  $I_{F(AV)}$ : 1.2 A
- Flammability rating UL94V-0 (Equivalent)
- Pins Pb (lead) free

## Package: Axial



## Description

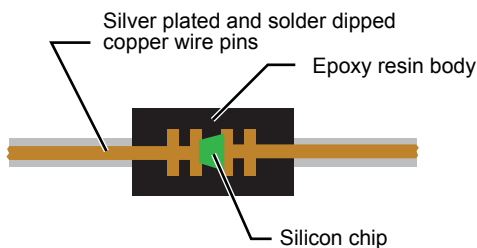
The SARS01 is an 800 V silicon diode designed especially for use in high-efficiency snubber circuits. This diode can sustain a high voltage with low loss, with low-noise rectification.

To suppress surge voltage, conduct the surge voltage and noise into a capacitor via a series resistor,  $R_S$ . Then allow the capacitor to discharge the energy into power supply line with the regenerative circuit operation, shown below in the typical application circuit schematic.

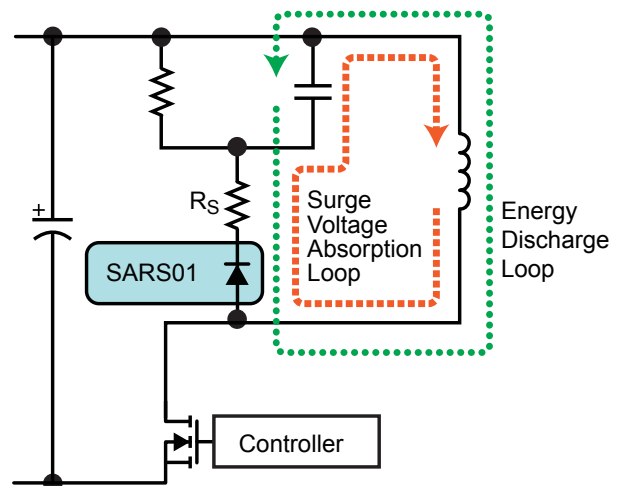
## Applications

- White goods appliances
- Audio-visual equipment
- Light fixtures
- Communication equipment
- Factory automation

## Product Structure



## Typical Application



**Selection Guide**

Part Number	Packing*
SARS01	1000 pieces per box, bulk
SARS01V	5000 pieces per reel, 52 mm pitch axial taping
SARS01V1	2000 pieces per box, 52 mm pitch axial taping
SARS01V0	2000 pieces per box, 26 mm pitch axial taping
SARS01W	4000 pieces per box, radial taping

\*See the Packing Options page for details on the packing orientation.

**Absolute Maximum Ratings**

Characteristic	Symbol	Conditions	Rating	Unit
Peak Reverse Surge Voltage	$V_{RSM}$		800	V
Peak Reverse Voltage	$V_{RM}$		800	V
Average Forward Current	$I_{F(AV)}$	Refer to figure 1	1.2	A
Peak Forward Surge Current	$I_{FSM}$	10 ms, half sine wave, one shot	110	A
Junction Temperature	$T_j$		-40 to 150	°C
Storage Temperature	$T_{stg}$		-40 to 150	°C

**Design Notes**

Use a series resistor ( $R_S$  in the typical application circuit schematic), and choose a value for the resistor such that the SARS01 diode saturates at junction temperature,  $T_j \leq 150^\circ\text{C}$ .

Electrical Characteristics valid at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Characteristic	Symbol	Test Conditions	Value	Unit
Forward Voltage	$V_F$	$I_F = 1.2\text{ A}$	0.92 (max)	V
Reverse Current	$I_R$	$V_R = V_{RM}$	10 (max)	$\mu\text{A}$
Reverse Current (High Temperature)	$I_{R(H)}$	$V_R = V_{RM}, T_j = 100^\circ\text{C}$	50 (max)	$\mu\text{A}$
Reverse Recovery Time	$t_{rr}$	$I_F = I_{RP} = 10\text{ mA}$ , 90% recovery point; refer to figure 2	2 to 18	$\mu\text{s}$
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	Between junction and pin	20 (max)	$^\circ\text{C/W}$

**Voltage Derating versus Ambient Temperature**  
Power loss by reverse voltage not included

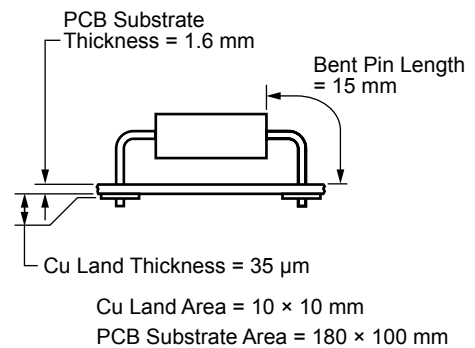
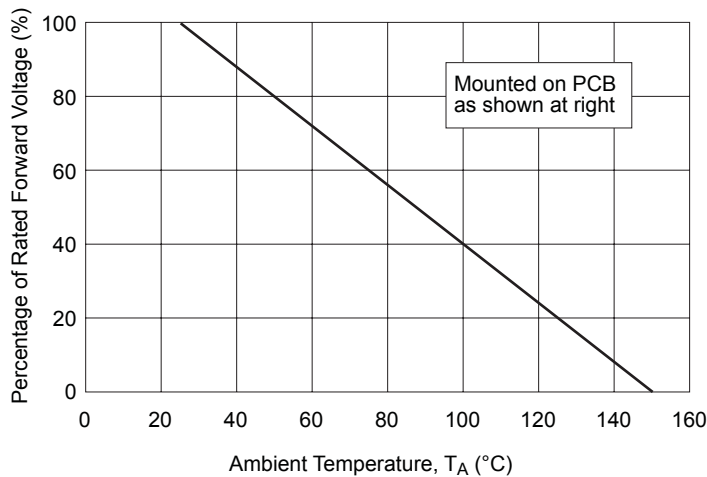


Figure 1. Derating Characteristic and Mounting Conditions

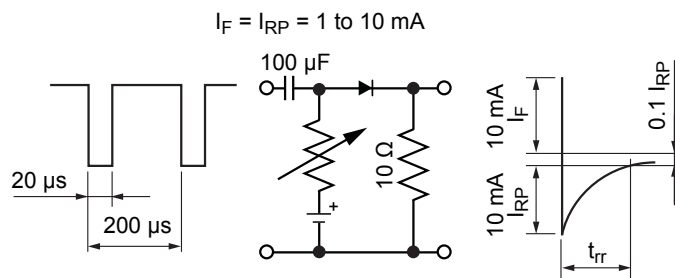
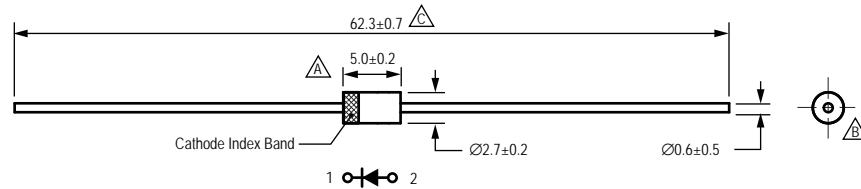


Figure 2. Definition of Peak Reverse Current,  $I_{RP}$

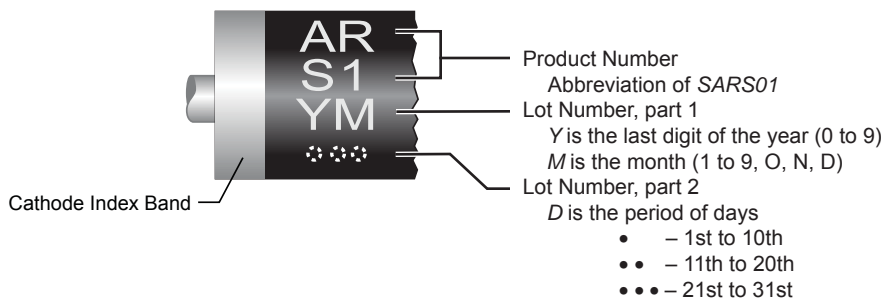
Package Outline



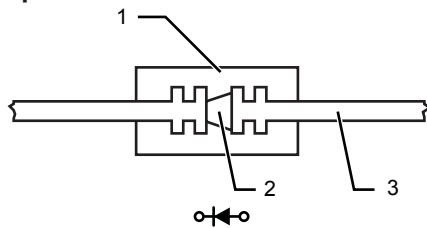
Dimensions in mm

- $\triangle A$  Offset body centerline to pin centerline 0.5 mm maximum
- $\triangle B$  Concentricity body and pin 0.3 mm maximum
- $\triangle C$  Pin dimension does not include trim burr; burr 2 mm maximum

Package Marking



Material Composition and Internal Structure



1. Body: Plastic, epoxy resin
2. Chip: Si
3. Pins: Cu wire  
Ag plating  
Solder dipped

Weight: Approximately 0.2 g

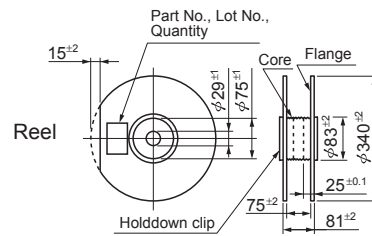
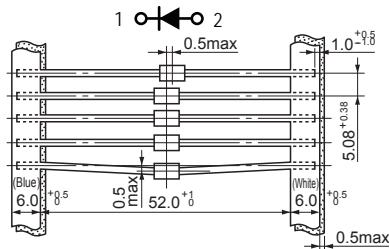


Pin treatment Pb-free. Device composition compliant with the RoHS directive.

Packing Options

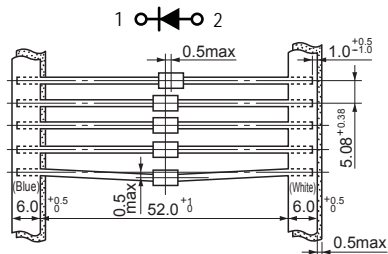
V orientation

Axial taping  
5,000 pieces  
per reel



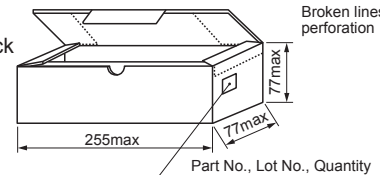
V1 orientation

Axial taping  
2,000 pieces  
per box



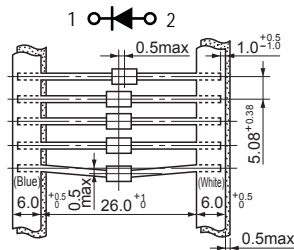
Ammunition  
(Ammo) pack

Broken lines:  
perforation



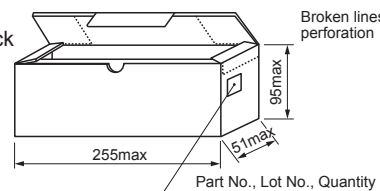
V0 orientation

Axial taping  
2,000 pieces  
per box



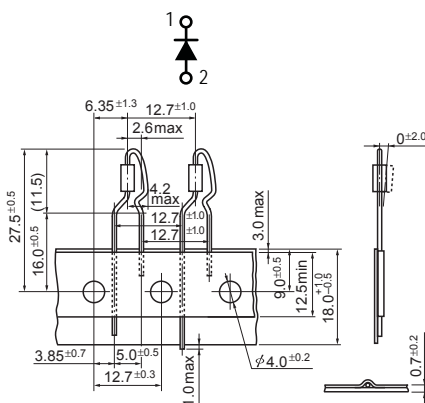
Ammunition  
(Ammo) pack

Broken lines:  
perforation



W orientation

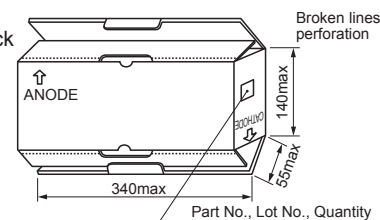
Radial taping  
4,000 pieces  
per box



Dimensions in mm

Ammunition  
(Ammo) pack

Broken lines:  
perforation



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In addition, it should be noted that since power devices or IC's including power devices have large self-heating value, the degree of derating of junction temperature affects the reliability significantly.

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