Working Together for a Greener Society

Future of Power Electronics and the Earth

Auxiliary Switch Diode for Snubbers

SARS-A1001N

■ Overview

The SARS-A1001N is an automotive-grade auxiliary switch diode especially designed for snubber circuits, which are used in the primary sides of isolated switched-mode power supplies. The SARS-A1001N-incorporated snubber circuits suppress switching noise by reducing the ringing voltage generated during turn-off compared to conventional designs.

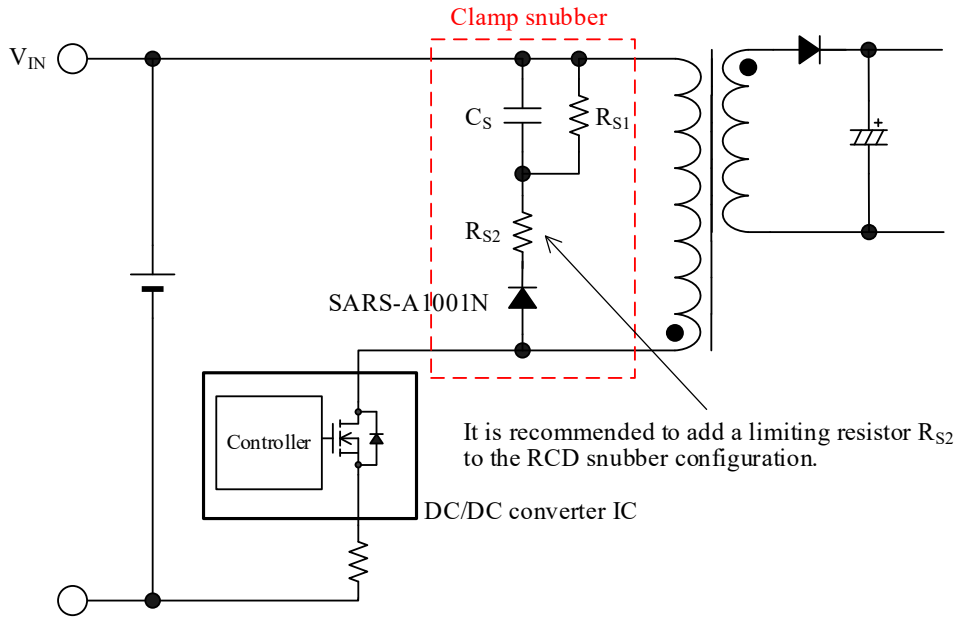
■ Application

- Isolated DC/DC Converter
- Isolated Off-line Converter

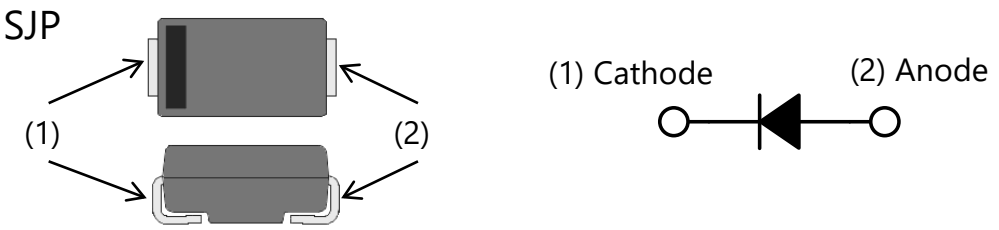
■ Features

- Automotive-grade Qualified
- Reduces Noise
- Bare lead frame: Pb-free (RoHS compliant)
- Flammability: Equivalent to UL94V-0
- AEC-Q101 Qualified

■ Typical Application



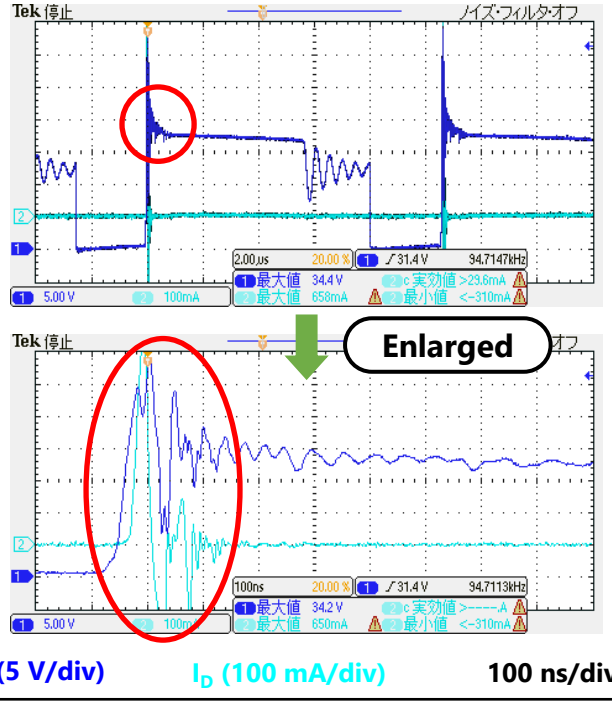
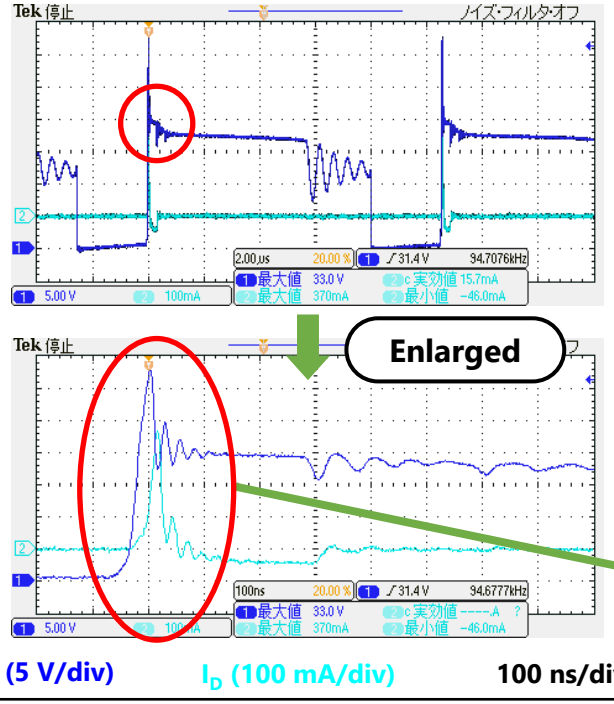
■ Package

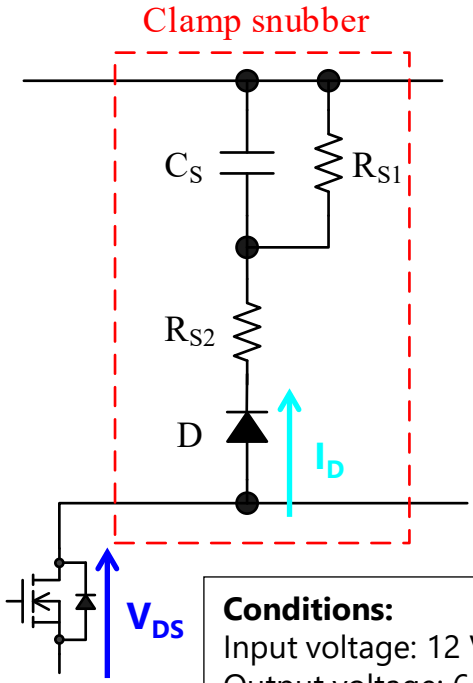


■ Selection Guide

Part Number	V_{RM}	$I_{F(AV)}$	T_J (max.)	V_F (max.)	I_R (max.)	H·I_R (max.)	trr
SARS-A1001N	100 V	1 A	150 ℃	0.9 V	5 μA	50 μA	0.6 μs to 1.5 μs

A clamp snubber circuit using the SARS-A1001N and a limiting resistor (R_{S2}) achieves reduced ringing and effective suppression of switching noise compared to a clamp snubber circuit that uses a typical fast recovery diode (FRD).

D	Competitors' FRD	SARS-A1001N
C_S	1 nF	100 nF
R_{S1}	1.2 kΩ	100 kΩ
R_{S2}	—	15 Ω
V_{DS} (peak)	34.4 V	33.0 V
Operational Waveforms		

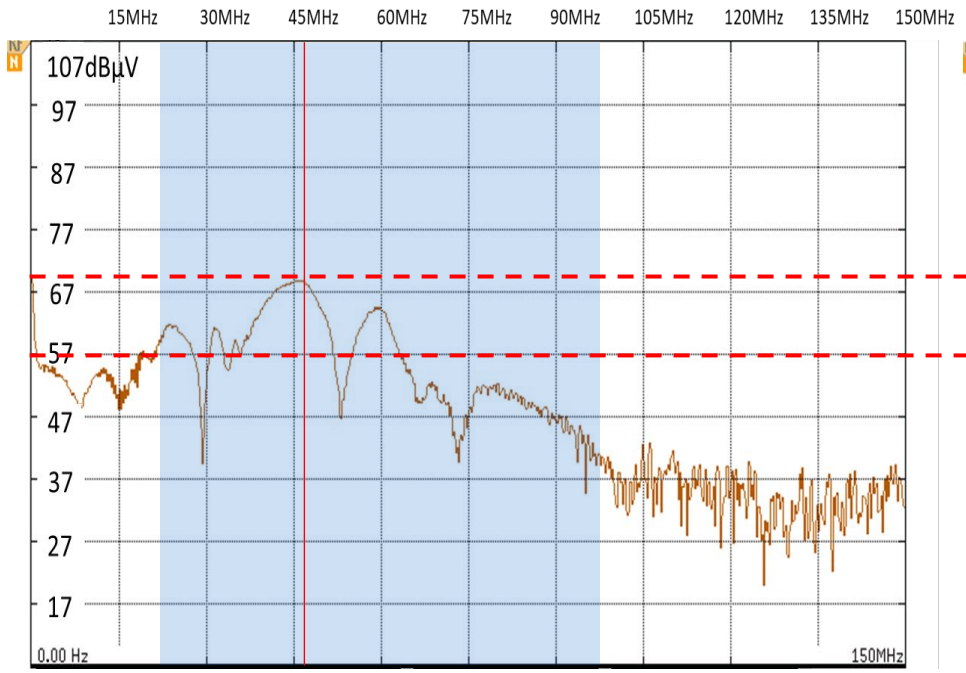


Conditions:
Input voltage: 12 VDC
Output voltage: 6.4 VDC
Output current: 0.35 A
Operating frequency: 100 kHz

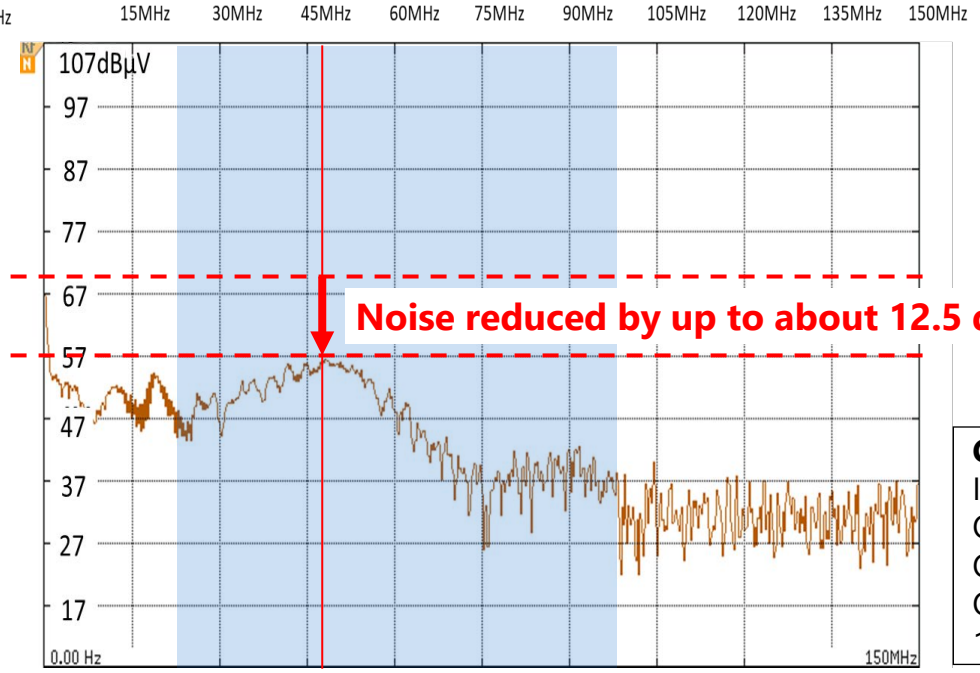
Suppresses undershoot and ringing in the 50 MHz to 60 MHz range

Using the SARS-A1001N reduces radiation noise in the 20 MHz to 100 MHz range.

Competitors' FRD



SARS-A1001N

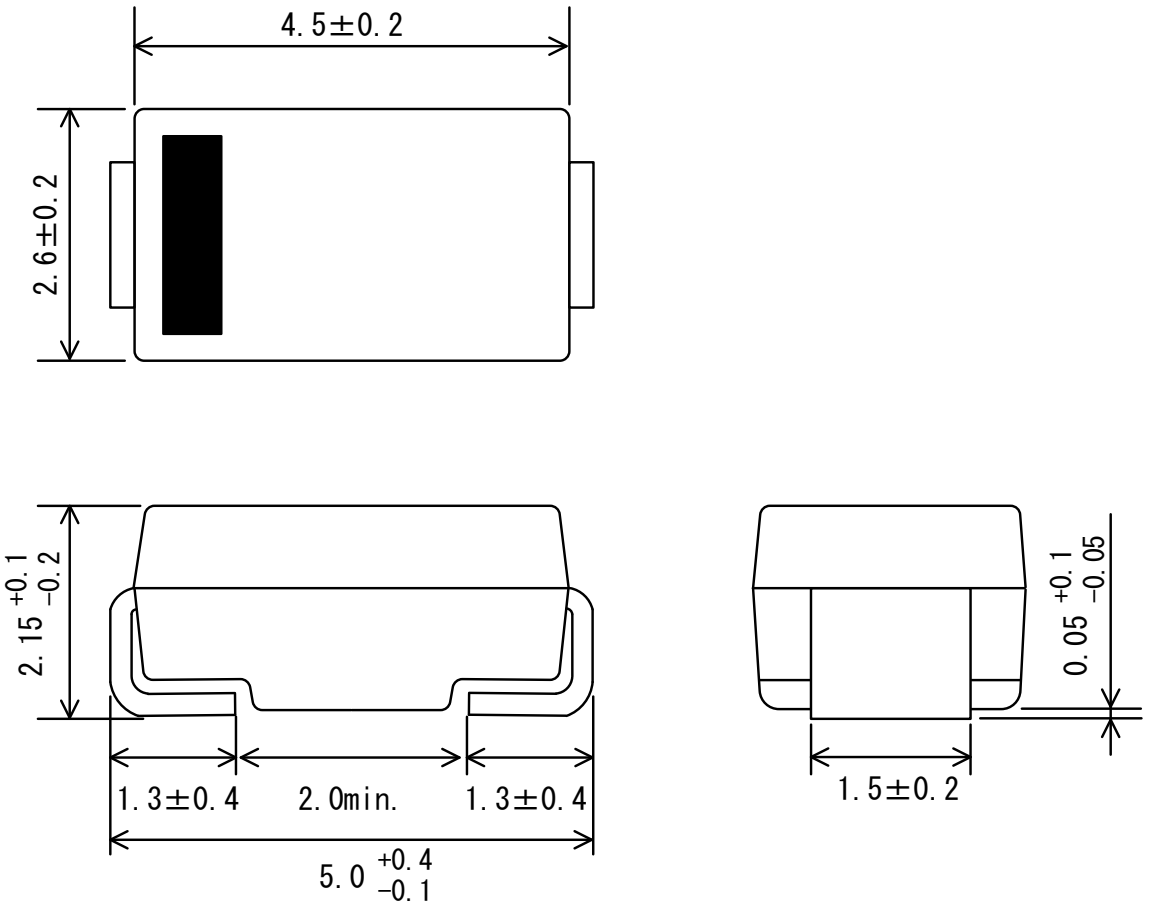


Noise reduced by up to about 12.5 dBµV

Conditions:
Input voltage: 12 VDC
Output voltage: 6.4 VDC
Output current: 0.35 A
Operating frequency: 100 kHz

* Relative evaluation result on our evaluation board under our test environment.

SJP



NOTE:

- 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

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