

S101S15V/S101S16V S201S15V/S201S16V

SIP Type SSR with Built-in Snubber Circuit

■ Features

1. High radiation resin mold package
 I_T : MAX. $3A_{rms}$
2. Isolation voltage between input and output
 V_{iso} : 3 000 V_{rms}
3. Built-in zero-cross circuit
(S101S16V/S201S16V)
4. Built-in snubber circuit
5. Recognized by UL, file No. E94758
Approved by CSA, file No. LR63705

■ Applications

1. Air conditioners
2. OA equipment

■ Model Line-ups

	For 100V lines	For 200V lines
No built-in zero-cross circuit	S101S15V	S201S15V
Built-in zero-cross circuit	S101S16V	S201S16V

■ Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Ratings		Unit	
		100V line	200V line		
Input	Forward current	I_F	50	mA	
	Reverse current	V_R	6	V	
	RMS ON-state current	I_T	3 ($T_c \leq 100^\circ\text{C}$)		
Output	*1 Peak one cycle surge current	I_{surge}	30	A	
	Repetitive peak OFF-state voltage	V_{DRM}	400	600	V
	Critical rate of rise of ON-state current	dl_T/dt	40		A/ μs
	Operating frequency	f	45 to 65		H _Z
	Operating temperature	T_{opr}	- 20 to + 80		°C
	Storage temperature	T_{stg}	- 30 to + 100		°C
*2 Isolation voltage	V_{iso}	3.0		kV _{rms}	
*3 Soldering temperature	T_{sol}	260		°C	

*1 60H_Z sine wave, $T_j = 25^\circ\text{C}$

*2 AC 60Hz for 1 minute, 40 to 60% RH

Isolation voltage measuring method:

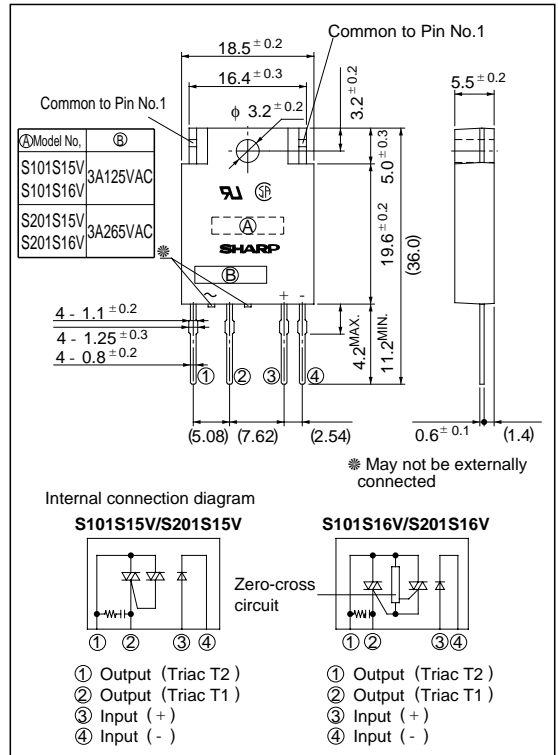
- (1) Dielectric withstand tester, with zero-cross circuit shall be used.
- (2) The waveform of applied voltage shall be sine wave.
- (3) It shall be applied voltage between input and output.

(Input and output shall be short-circuited respectively)

*3 For 10 seconds

■ Outline Dimensions

(Unit : mm)



Electrical Characteristics

(Ta = 25°C)

Parameter		Symbol	Condition	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V_F	$I_F = 20\text{mA}$	-	1.2	1.4	V	
	Reverse current	I_R	$V_R = 3\text{V}$	-	-	10^{-4}	A	
Output	ON-state voltage	V_T	Resistance load, $I_F = 20\text{mA}$, $I_T = 1.5\text{A}_{\text{rms}}$	-	-	1.5	V_{rms}	
	Minimum operating current	S101S15V/16V S201S15V/16V	I_{OP}	$V_{OUT} = 120\text{V}_{\text{rms}}$	-	-	50	mA_{rms}
				$V_{OUT} = 240\text{V}_{\text{rms}}$	-	-		
	Open circuit leak current	S101S15V/16V S201S15V/16V	I_{leak}	$V_{OUT} = 120\text{V}_{\text{rms}}$	-	-	5	mA_{rms}
				$V_{OUT} = 240\text{V}_{\text{rms}}$	-	-	10	
	Critical rate of rise of OFF-state voltage		dV/dt	$V_D = 2/3V_{\text{DRM}}$	30	-	-	$\text{V}/\mu\text{s}$
Commutation critical rate of rise of OFF-state voltage		$(dV/dt)_c$	$T_j = 125^\circ\text{C}$, $V_D = 400\text{V}$, $dI_T/dt = -1.5\text{A/ms}$	4	-	-	$\text{V}/\mu\text{s}$	
Transfer characteristics	Minimum trigger current	S101S15V/S201S15V	I_{FT}	$V_D = 12\text{V}$, $R_L = 30\Omega$	-	-	15	mA
		S101S16V/S201S16V		$V_D = 6\text{V}$, $R_L = 30\Omega$				
	Isolation resistance		R_{ISO}	DC500V, $R_H = 40$ to 60%	10^{10}	-	-	Ω
	Zero-cross voltage	S101S16V	V_{OX}	$I_F = 15\text{mA}$	-	-	35	V
		S201S16V			-	-	35	
	Turn-on time	S101S15V/S201S15V	ton	AC50H _Z	-	-	1	ms
		S101S16V/S201S16V			-	-	10	
	Turn-off time		toff	AC50H _Z	-	-	10	ms
Thermal resistance Between junction and case		$R_{th(j-c)}$	-	-	6	-	$^\circ\text{C/W}$	
Thermal resistance Between junction and ambient		$R_{th(j-a)}$	-	-	45	-	$^\circ\text{C/W}$	

Fig. 1 RMS ON-state Current vs. Ambient Temperature

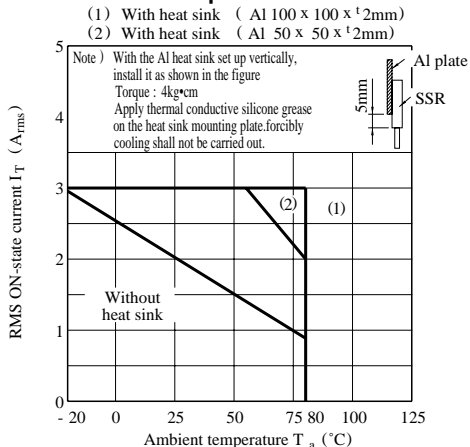


Fig. 2 RMS ON-state Current vs. Case Temperature

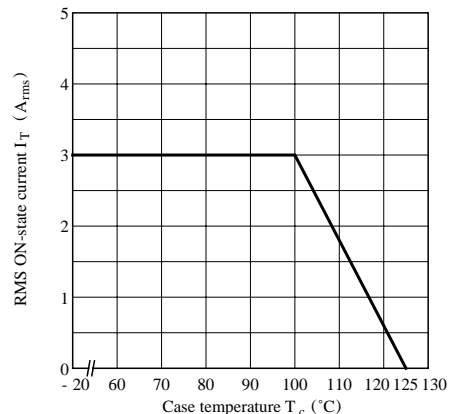


Fig. 3 Forward Current vs. Ambient Temperature

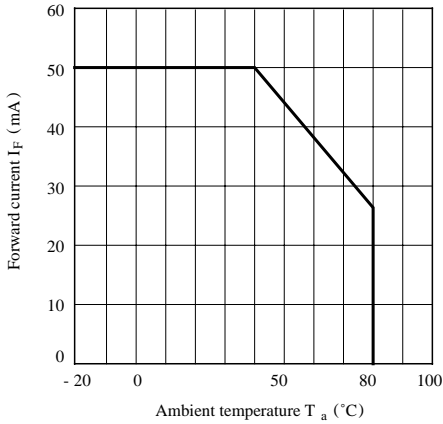


Fig. 5 Forward Current vs. Forward Voltage

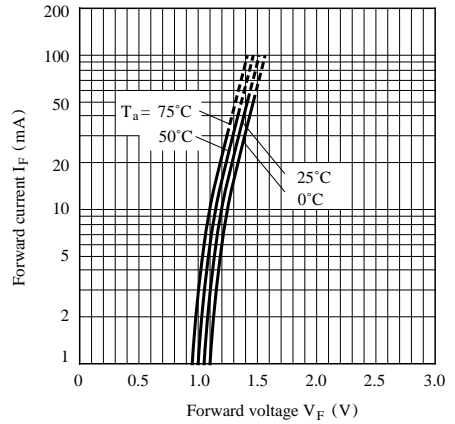


Fig. 5 Surge Current vs. Power-on cycle

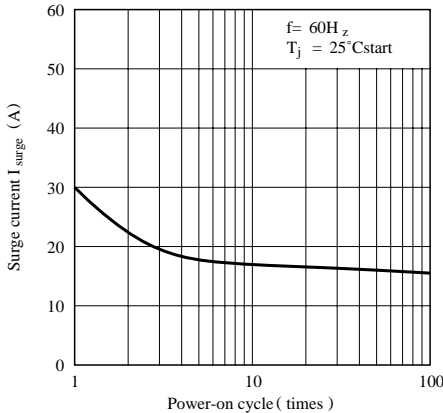


Fig. 6 Maximum ON-state Power Dissipation vs. RMS ON-state Current (Typical Value)

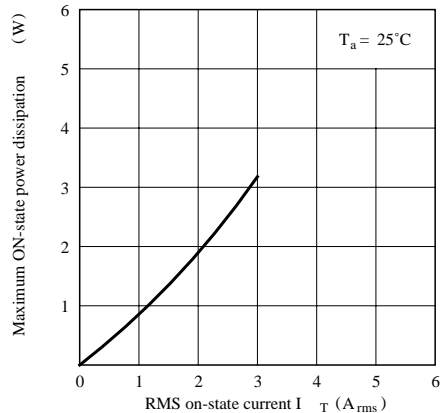


Fig. 7-a Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S101S15V/S201S15V)

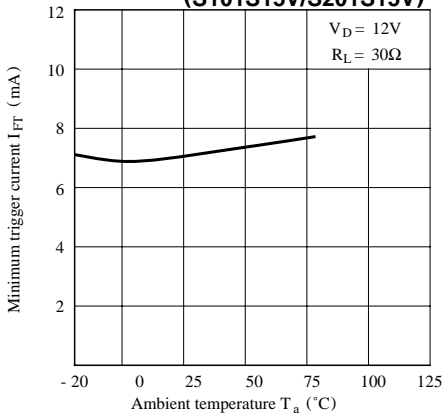


Fig. 7-b Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S101S16V/S201S16V)

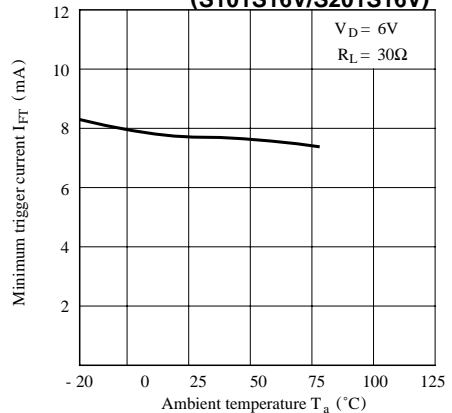


Fig. 8-a Open Circuit Leak Current vs. Supply Voltage (Typical Value)
(S101S15V, S101S16V)

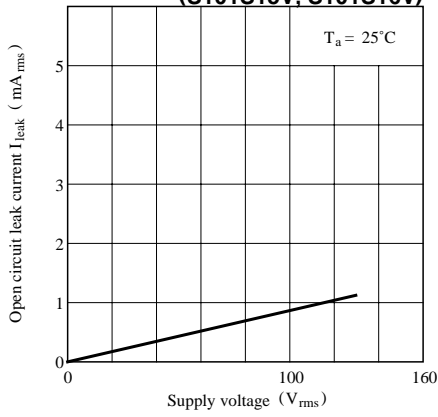
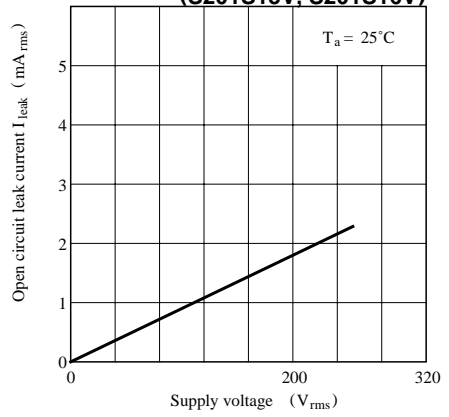


Fig. 8-b Open Circuit Leak Current vs. Supply Voltage (Typical Value)
(S201S15V, S201S16V)



● Please refer to the chapter “Precautions for Use.”

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:
 - (i) The devices in this publication are designed for use in general electronic equipment designs such as:
 - Personal computers
 - Office automation equipment
 - Telecommunication equipment [terminal]
 - Test and measurement equipment
 - Industrial control
 - Audio visual equipment
 - Consumer electronics
 - (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
 - Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
 - Traffic signals
 - Gas leakage sensor breakers
 - Alarm equipment
 - Various safety devices, etc.
 - (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
 - Space applications
 - Telecommunication equipment [trunk lines]
 - Nuclear power control equipment
 - Medical and other life support equipment (e.g., scuba).
- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
- This publication is the proprietary product of SHARP and is copyrighted, with all rights reserved. Under the copyright laws, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP. Express written permission is also required before any use of this publication may be made by a third party.
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.