

# S101S01 Series SIP Type SSR for Low Power Control

## S201S01 Series

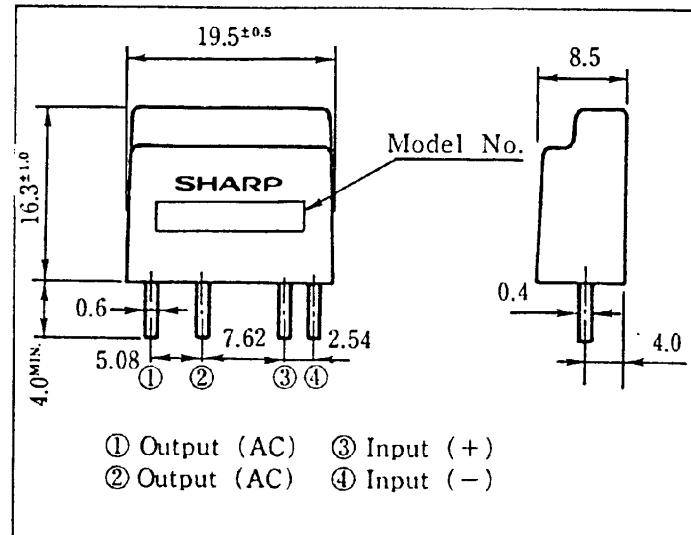
### ■ Features

1. Compact and thin (Single-in-line package)
2. High resistance to surge current  
S101S01/S101S03 (I<sub>surge</sub> : 71A)
3. Built-in zero-cross circuit  
(S101S02/S101S04/S201S02/S201S04)
4. High repetitive off-state voltage  
S101S01 Series (V<sub>DRM</sub> : 400V)  
S201S01 Series (V<sub>DRM</sub> : 600V)
5. Isolation voltage between input and output  
(V<sub>iso</sub> : 4,000Vrms)
6. UL recognized,  
file No. E94758 : S101S01 Series  
CSA approved  
No. 63705 : S101S01 Series  
TÜV approved No. R75165 : S201S01

### ■ Applications

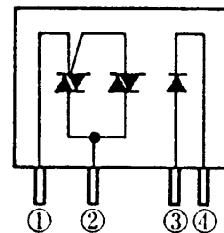
1. TVs
2. Air conditioners
3. Programmable controllers

### ■ Outline Dimensions (Unit : mm)

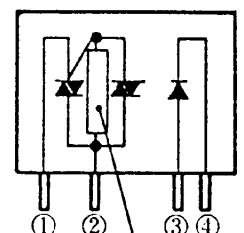


#### Internal connection diagram

S101S01/S201S01

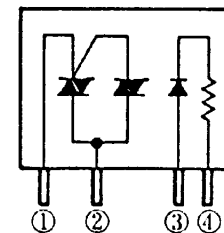


S101S02/S201S02

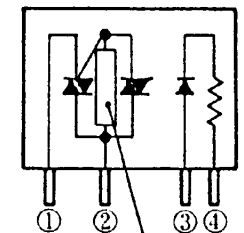


Zero-cross circuit

S101S03/S201S03



S101S04/S201S04



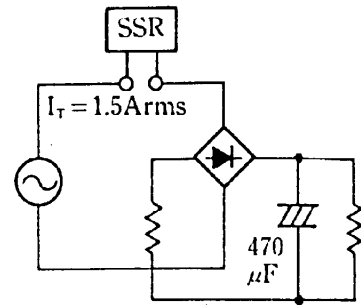
Zero-cross circuit

### Absolute Maximum Ratings

(Ta = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	S101S01/S101S02 S201S01/S201S02	I <sub>F</sub>	50 mA
	Input signal voltage	S101S03/S101S04 S201S03/S201S04	V <sub>IN</sub>	6 V
	Reverse voltage		V <sub>R</sub>	6 V
Output	RMS on-state current		I <sub>T</sub>	1.5 Arms
	*1 Surge current	S101S01/S101S03	I <sub>surge</sub>	71 A
	*2 Peak one cycle surge current	S101S02/S101S04 S201S01 Series		30 A
	Repetitive peak off-state voltage	S101S01 Series	V <sub>DRM</sub>	400 V
		S201S01 Series		600 V
	Non-repetitive peak off-state voltage	S101S01 Series	V <sub>DSM</sub>	420 V
		S201S01 Series		615 V
	Critical rate of rise of on-state current		dI <sub>T</sub> /dt	40
*3 Isolation voltage		V <sub>ISO</sub>	4,000	Vrms
Operating temperature		T <sub>opr</sub>	-25 ~ +100	°C
Storage temperature		T <sub>stg</sub>	-30 ~ +125	°C
*4 Soldering temperature		T <sub>sol</sub>	260	°C

### Basic Circuit for Surge Current



Determined by the peak value of surge current obtained when the output is on at AC 100V peak value ( $100\sqrt{2}$ ).

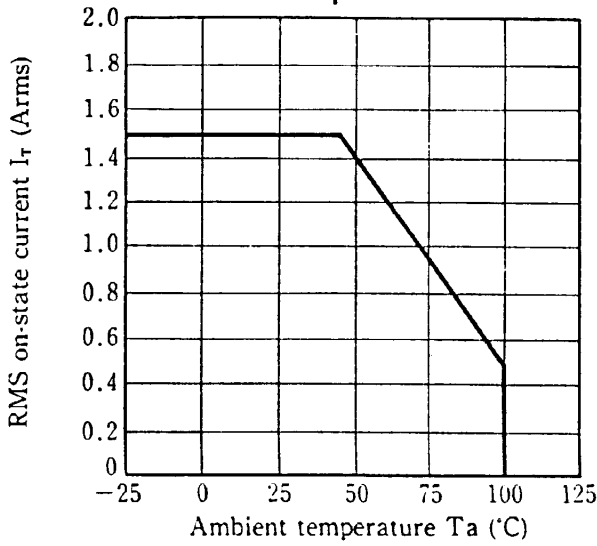
- \*1 Determined by above circuit
- \*2 60Hz, sine wave
- \*3 RH = 40 ~ 60%, AC 60Hz for 1 minute
- \*4 For 10 seconds

### Electrical Characteristics

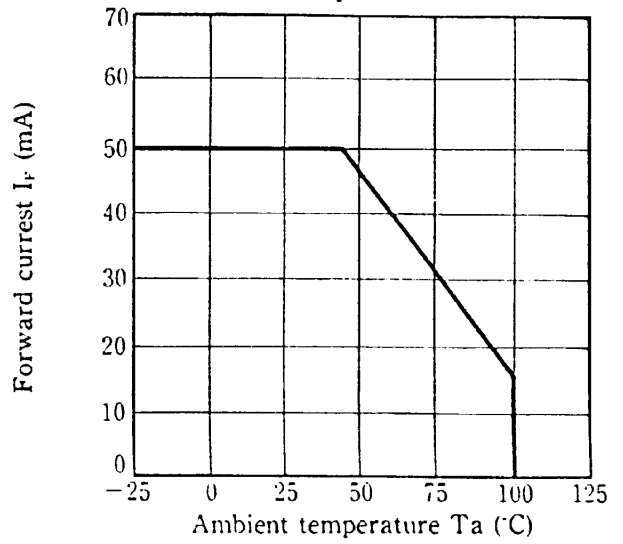
(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	S101S01/S101S02 S201S01/S201S02	V <sub>F</sub>	I <sub>F</sub> = 20mA	—	1.2	1.4 V	
	Reverse current	S101S01/S101S02 S201S01/S201S02	I <sub>R</sub>	V <sub>R</sub> = 3V	—	—	10 <sup>-4</sup> A	
	Input signal voltage	S101S03/S101S04 S201S03/S201S04	V <sub>IN</sub>	T <sub>a</sub> = T <sub>opr</sub>	4	5	6 V	
	Input resistance	S101S03/S101S04 S201S03/S201S04	R <sub>IN</sub>		117	130	143 Ω	
	Pick-up voltage	S101S03/S101S04 S201S03/S201S04	V <sub>pu</sub>	V <sub>D</sub> = 6V, R <sub>M</sub> = 30Ω	—	—	4 V	
	Drop-out voltage	S101S03/S101S04 S201S03/S201S04	V <sub>do</sub>	V <sub>D</sub> = 200V	1	—	— V	
Output	Repetitive peak off-state current		I <sub>DRM</sub>	V <sub>D</sub> = V <sub>DRM</sub>	—	—	10 <sup>-4</sup> A	
	On-state voltage		V <sub>T</sub>	I <sub>T</sub> = 1.5Arms, R load	—	—	1.5 Vrms	
	Holding current		I <sub>H</sub>		—	—	50 mA	
	Critical rate of rise of off-state voltage		dv/dt	V <sub>D</sub> = 2/3V <sub>DRM</sub>	30	—	— V/μs	
	Commutation critical rate of rise of off-state voltage		(dv/dt) <sub>c</sub>	T <sub>j</sub> = 125°C, V <sub>D</sub> = 400V dI <sub>T</sub> /dt = -1.0A/ms	4	—	— V/μs	
	Zero-cross voltage		V <sub>ox</sub>	I <sub>F</sub> = 15mA	—	—	35 V	
Transfer characteristics	Minimum trigger current	S101S01/S101S02 S201S01/S201S02	I <sub>FT</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 30Ω	—	—	15 mA	
	Isolation resistance		R <sub>ISO</sub>	DC500V, RH = 40 ~ 60%	10 <sup>10</sup>	—	— Ω	
	Turn-on time	S101S01/S101S03 S201S01/S201S03	t <sub>on</sub>	AC50Hz	—	—	1	ms
		S101S02/S101S04 S201S02/S201S04			—	—	10	
	Turn-off time		t <sub>off</sub>	AC50Hz	—	—	10	ms
Thermal resistance (between junction and ambience)		R <sub>th(j-a)</sub>		—	60	—	°C/W	

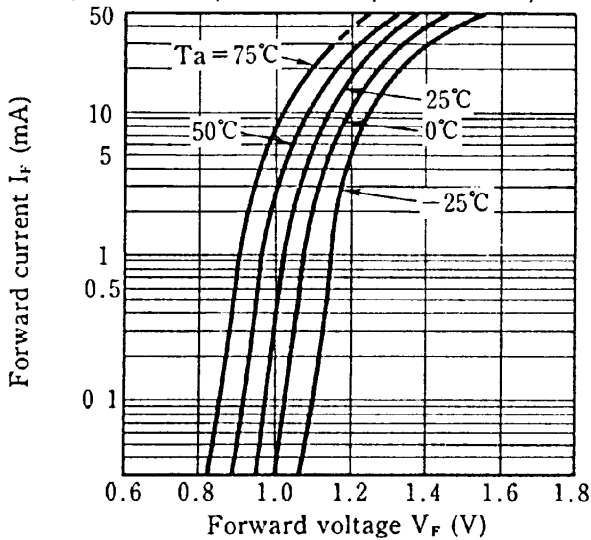
**Fig. 1 RMS On-state Current vs. Ambient Temperature**



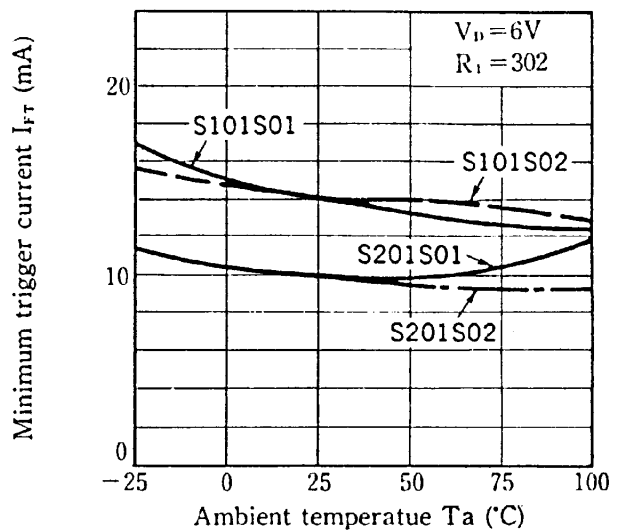
**Fig. 2 Forward Current vs. Ambient Temperature**



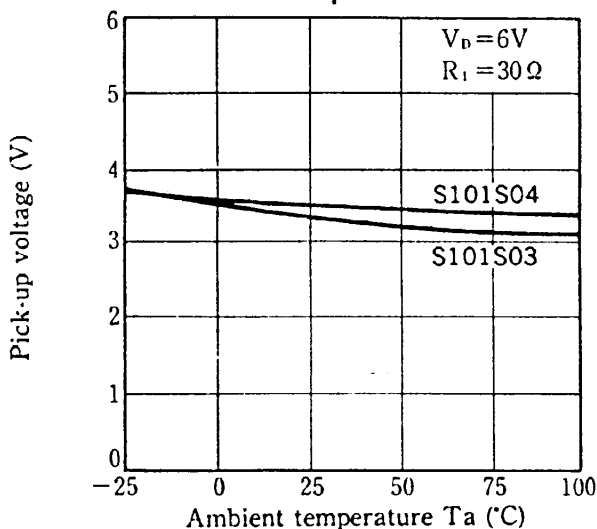
**Fig. 3 Forward Current vs. Forward Voltage**  
(S101S01/S101S02/S201S01/S201S02)



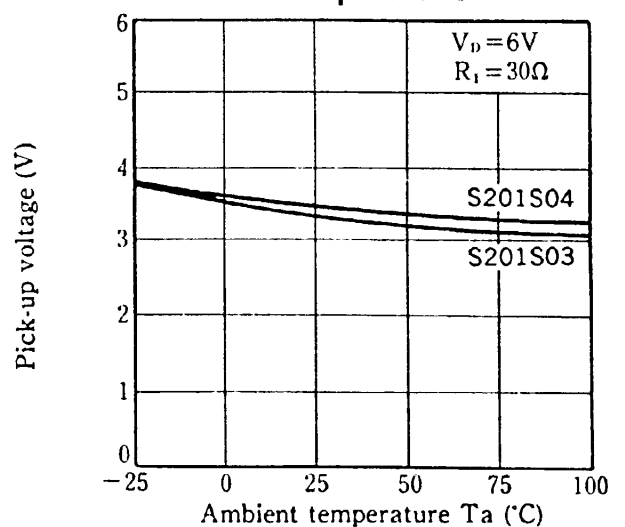
**Fig. 4 Minimum Trigger Current vs. Ambient Temperature**  
(S101S01/S101S02/S201S01/S201S02)



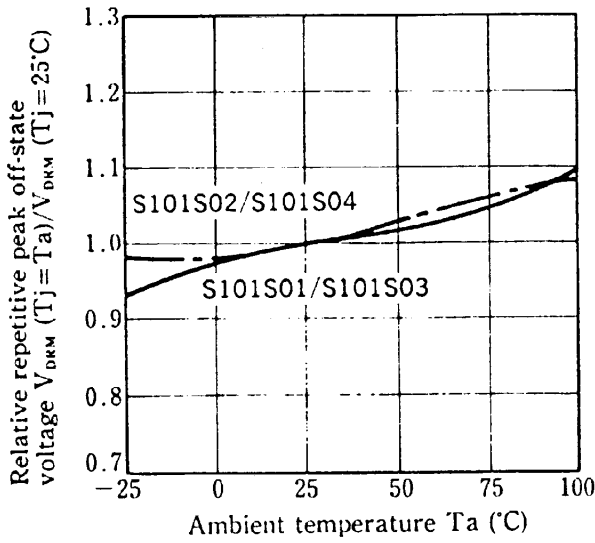
**Fig. 5 Pick-up Voltage vs. Ambient Temperature**



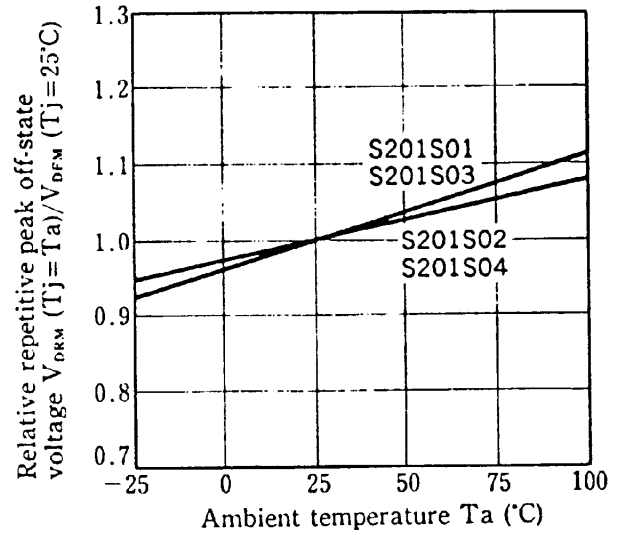
**Fig. 6 Pick-up Voltage vs. Ambient Temperature**



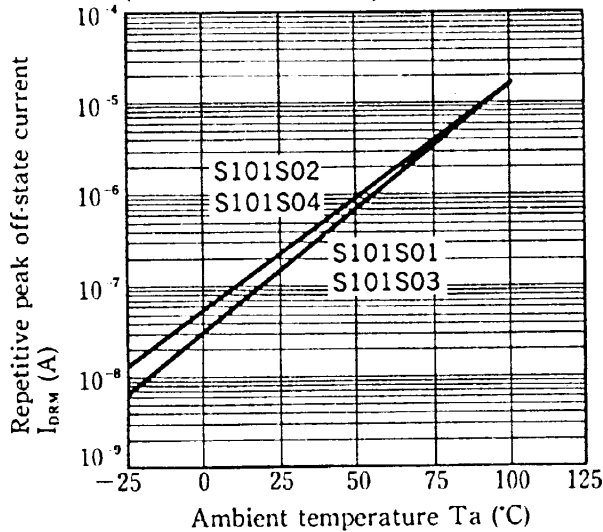
**Fig. 7 Relative Repetitive Peak Off-state Voltage vs. Ambient Temperature (S101S01 Series)**



**Fig. 8 Relative Repetitive Peak Off-state Voltage vs. Ambient Temperature (S201S01 Series)**



**Fig. 9 Repetitive Peak Off-state Current vs. Ambient Temperature (S101S01 Series)**



**Fig. 10 Repetitive Peak Off-state Current vs. Ambient Temperature (S201S01 Series)**

