

# S102S01/S102S02 S202S01/S202S02

## SIP Type SSR for Medium Power Control

### ■ Features

- High radiation resin mold package
- RMS ON-state current  
 $I_T$  : 8 Arms at  $T_C \leq 80^\circ\text{C}$   
 (With heat sink)
- Built-in zero-cross circuit  
 (S102S02/S202S02)
- High repetitive peak OFF-state voltage  
 S102S01/S102S02  $V_{DRM}$  : MIN. 400V  
 S202S01/S202S02  $V_{DRM}$  : MIN. 600V
- Isolation voltage between input and output  
 ( $V_{iso}$  : 4 000V<sub>rms</sub>)
- Approved by CSA, No. LR63705  
 Recognized by UL, file No. E94758

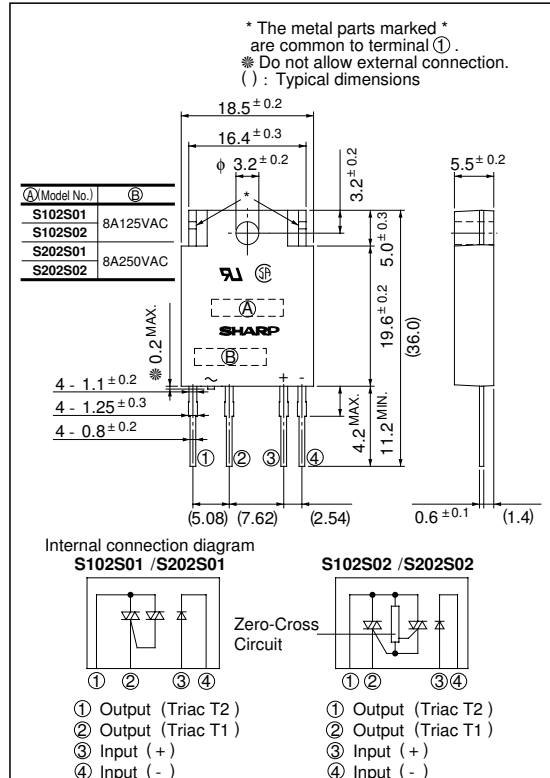
### ■ Applications

- Automatic vending machines, programmable controllers
- Amusement equipment

### ■ Model Line-ups

	For 100V lines	For 200V lines
For phase control	<b>S102S01</b>	<b>S202S01</b>
No built-in zero-cross circuit	<b>S102S01</b>	<b>S202S01</b>
Built-in zero-cross circuit	<b>S102S02</b>	<b>S202S02</b>

### ■ Outline Dimensions (Unit : mm)



### ■ Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Rating		Unit
		S102S01 S102S02	S202S01 S202S02	
Input	Forward current	50		mA
	Reverse voltage	6		V
Output	*1RMS ON-state current	8		A <sub>rms</sub>
	*2Peak one cycle surge current	80		A
	Repetitive peak OFF-state voltage	400	600	V
	Non-repetitive peak OFF-state voltage	400	600	V
	Critical rate of rise of ON-state current	50		A/μs
Operating frequency	f	45 to 65		Hz
*3Isolation voltage	V <sub>iso</sub>	4 000		V <sub>rms</sub>
Operating temperature	T <sub>opr</sub>	- 25 to + 100		°C
Storage temperature	T <sub>stg</sub>	- 30 to + 125		°C
*4Soldering temperature	T <sub>sol</sub>	260		°C

\*1  $T_C \leq 80^\circ\text{C}$   
 \*2 50Hz sine wave,  $T_j = 25^\circ\text{C}$  start  
 \*3 60Hz AC for 1 minute, 40 to 60% RH, Apply voltages between input and output, by the dielectric withstand voltage tester with zero-cross circuit. (Input and output shall be shorted respectively).  
 (Note)  
 When the isolation voltage is necessary at using external heat sink, please use the insulation sheet.  
 \*4 For 10 seconds

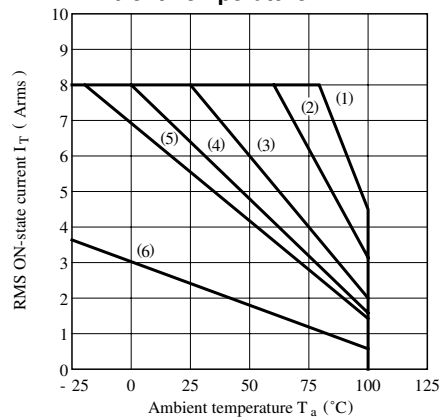
" In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device."

■ Electro-optical Characteristics

(Ta = 25°C)

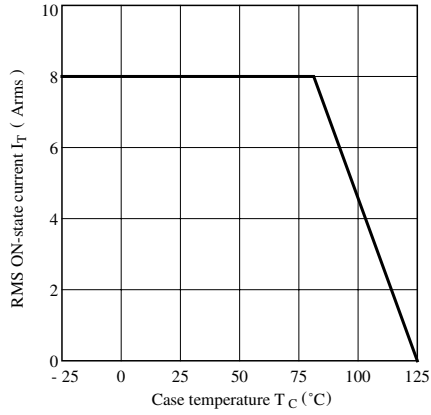
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	-	1.2	1.4	V	
	Reverse current	$I_R$	$V_R = 3\text{V}$	-	-	$10^{-4}$	A	
Output	Repetitive peak OFF-state current	$I_{DRM}$	$V_D = V_{DRM}$	-	-	$10^{-4}$	A	
	ON-state voltage	$V_T$	Resistance load $I_F = 20\text{mA}, I_T = 2\text{Arms}$	-	-	1.5	$V_{rms}$	
	Holding current	$I_H$	-	-	-	50	mA	
	Critical rate of rise of OFF-state voltage	$dV/dt$	$V_D = 2/3 \cdot V_{DRM}$	30	-	-	$V/\mu s$	
	Critical rate of rise of commutating OFF-state voltage	$(dV/dt)_C$	$T_J = 125^\circ\text{C}, dI_T/dt = 4.0\text{A/ms}, V_D = 400\text{V}$	5	-	-	$V/\mu s$	
	Zero-cross voltage	$V_{OX}$	$I_F = 8\text{mA}$	-	-	35	V	
Transfer characteristics	Minimum trigger current	S102S01 S202S02	$I_{FT}$	$V_D = 12\text{V}, R_L = 30\Omega$	-	-	8	mA
		S102S02 S202S02		$V_D = 6\text{V}, R_L = 30\Omega$	-	-	8	mA
	Isolation resistance	$R_{ISO}$	DC500V, 40 to 60 % RH	$10^{10}$	-	-	$\Omega$	
	Turn-on time	S102S01 S202S01	$t_{on}$	AC 50Hz	-	-	1	ms
		S102S02 S202S02			-	-	10	ms
	Turn-off time	$t_{off}$	-	-	-	-	10	ms
Thermal resistance (Between junction and case)	$R_{th(j-c)}$	-	-	-	4.5	-	$^\circ\text{C/W}$	
Thermal resistance (Between junction and ambience)	$R_{th(j-a)}$	-	-	-	40	-	$^\circ\text{C/W}$	

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

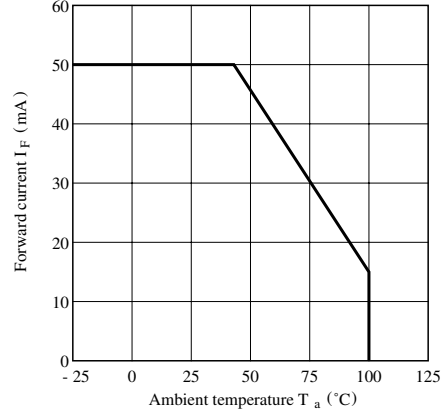


- (1) With infinite heat sink
- (2) With heat sink (200 x 200 x 2 mm Al plate)
- (3) With heat sink (100 x 100 x 2 mm Al plate)
- (4) With heat sink (75 x 75 x 2 mm Al plate)
- (5) With heat sink (50 x 50 x 2 mm Al plate)
- (6) Without heat sink
- (Note) With the Al heat sink set up vertically, tighten the device at the center of the Al heat sink with a torque of 0.4N·m and apply thermal conductive silicone grease on the heat sink mounting plate. Forcible cooling shall not be carried out.

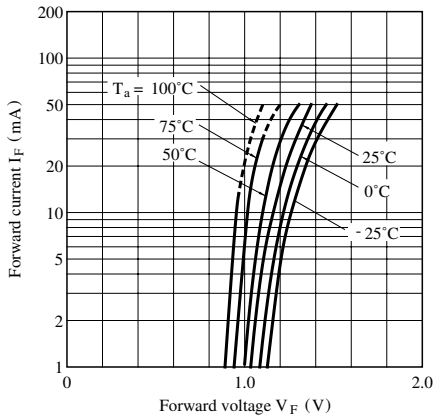
**Fig. 2 RMS ON-state Current vs. Case Temperature**



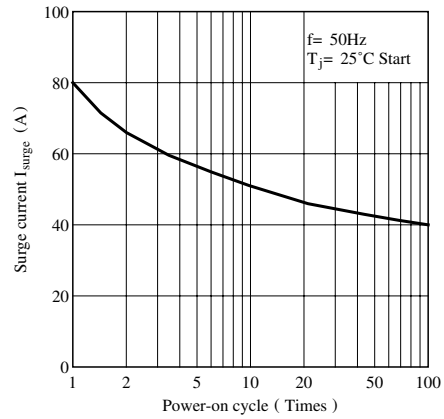
**Fig. 3 Forward Current vs. Ambient Temperature**



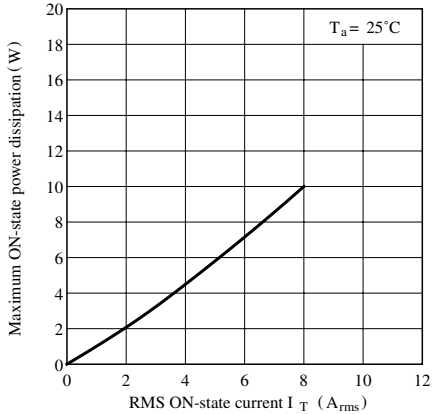
**Fig. 4 Forward Current vs. Forward Voltage**



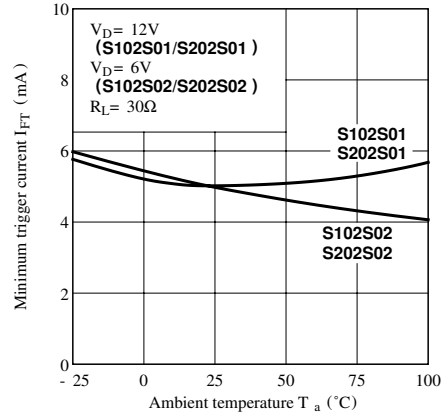
**Fig. 5 Surge Current vs. Power-on Cycle**



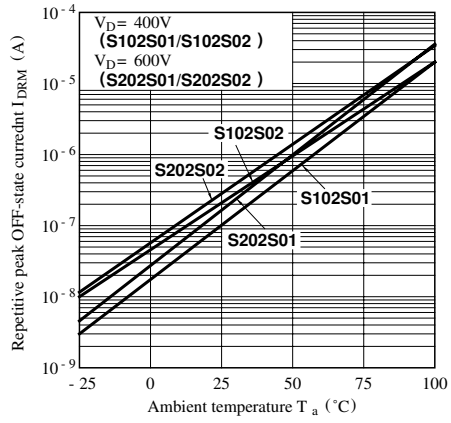
**Fig. 6 Maximum ON-state Power Dissipation vs. RMS ON-state Current (Typical Value)**



**Fig. 7 Minimum Trigger Current vs. Ambient Temperature (Typical Value)**



**Fig. 8 Repetitive Peak OFF-state Current vs. Ambient Temperature (Typical Value)**



● Please refer to the chapter “Precautions for Use”