

# S102S01/S102S02 S202S01/S202S02

## SIP Type SSR for Medium Power Control

### ■ Features

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

### ■ Applications

1. Automatic vending machines, programmable controllers
2. Amusement equipment

### ■ Model Line-ups

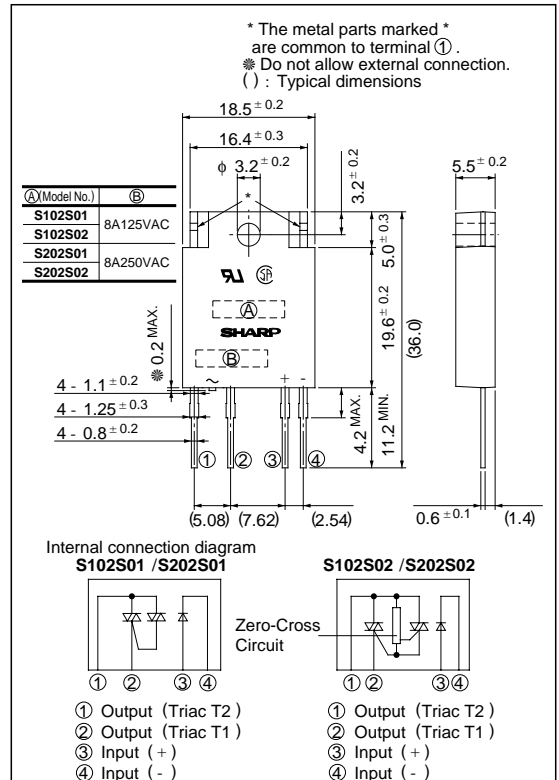
	For 100V lines	For 200V lines
For phase control No built-in zero-cross circuit	<b>S102S01</b>	<b>S202S01</b>
Built-in zero-cross circuit	<b>S102S02</b>	<b>S202S02</b>

### ■ Absolute Maximum Ratings

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/ $\mu\text{s}$
Operating frequency	f	45 to 65		Hz
*3Isolation voltage	$V_{\text{iso}}$	4 000		V <sub>rms</sub>
Operating temperature	$T_{\text{opr}}$	- 25 to + 100		$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	- 30 to + 125		$^\circ\text{C}$
*4Soldering temperature	$T_{\text{sol}}$	260		$^\circ\text{C}$

### ■ Outline Dimensions

(Unit : mm)



(Ta = 25°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.

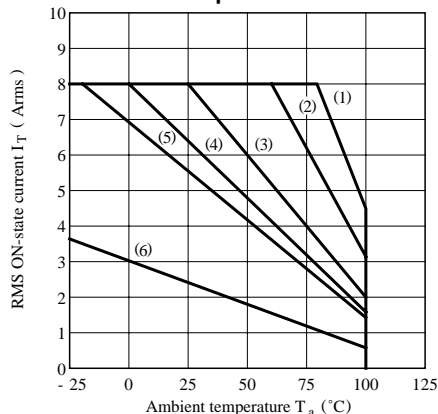
\*4 For 10 seconds

## Electro-optical Characteristics

(Ta = 25°C)

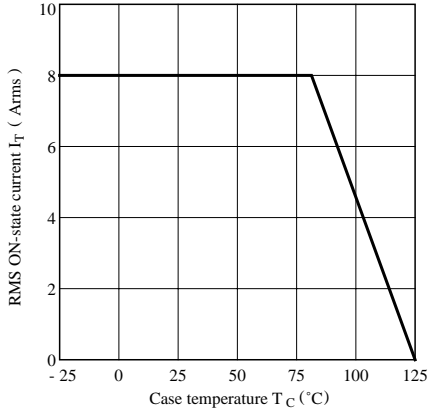
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	-	1.2	1.4	V
	Reverse current	$I_R$	$V_R = 3\text{V}$	-	-	$10^{-4}$	A
Output	Repetitive peak OFF-state current	$I_{DRM}$	$V_D = V_{DRM}$	-	-	$10^{-4}$	A
	ON-state voltage	$V_T$	Resistance load $I_F = 20\text{mA}, I_T = 2\text{Arms}$	-	-	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	-	-	$V/\mu\text{s}$
	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	-	-	$V/\mu\text{s}$
	Zero-cross voltage	$V_{OX}$	$I_F = 8\text{mA}$	-	-	35	V
	Transfer characteristics	Minimum trigger current	$I_{FT}$	$V_D = 12\text{V}, R_L = 30\Omega$	-	-	8
$I_{FT}$			$V_D = 6\text{V}, R_L = 30\Omega$	-	-	8	mA
Isolation resistance		$R_{ISO}$	DC500V, 40 to 60 % RH	$10^{10}$	-	-	$\Omega$
Turn-on time		$t_{on}$	AC 50Hz	-	-	1	ms
		$t_{on}$	AC 50Hz	-	-	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**

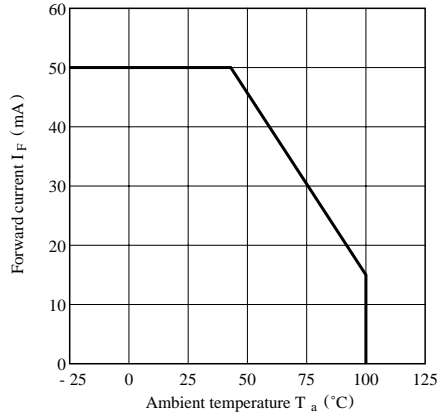


- (1) With infinite heat sink
  - (2) With heat sink (200 x 200 x 2 mm Al plate)
  - (3) With heat sink (100 x 100 x 2 mm Al plate)
  - (4) With heat sink (75 x 75 x 2 mm Al plate)
  - (5) With heat sink (50 x 50 x 2 mm Al plate)
  - (6) Without heat sink
- (Note) With the Al heat sink set up vertically, 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.

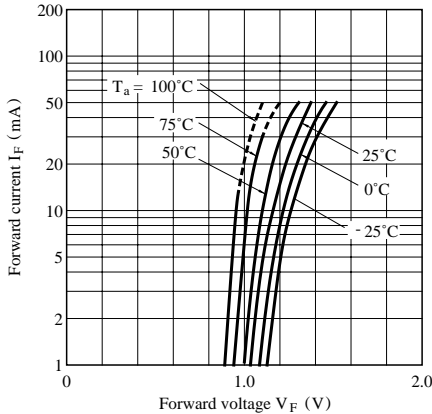
**Fig. 2 RMS ON-state Current vs. Case Temperature**



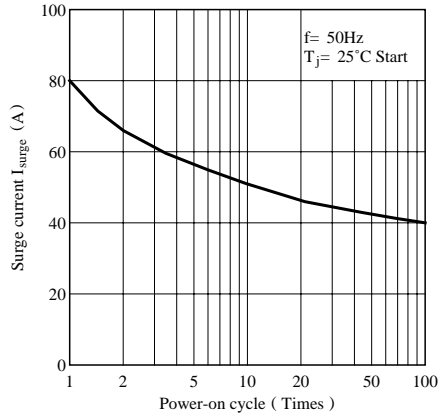
**Fig. 3 Forward Current vs. Ambient Temperature**



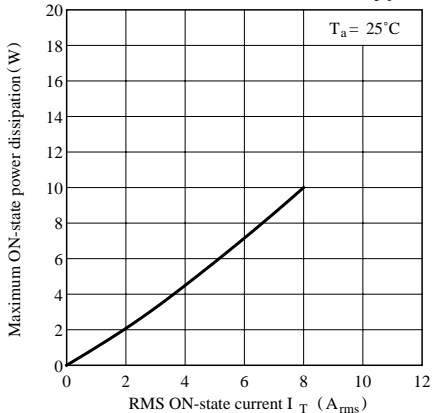
**Fig. 4 Forward Current vs. Forward Voltage**



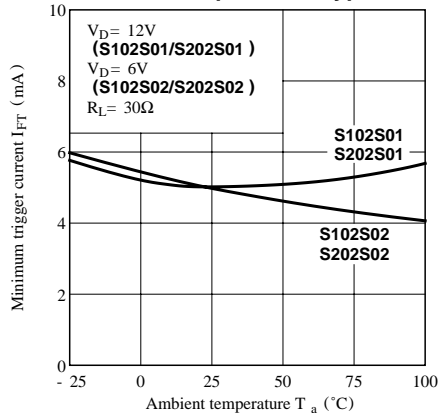
**Fig. 5 Surge Current vs. Power-on Cycle**



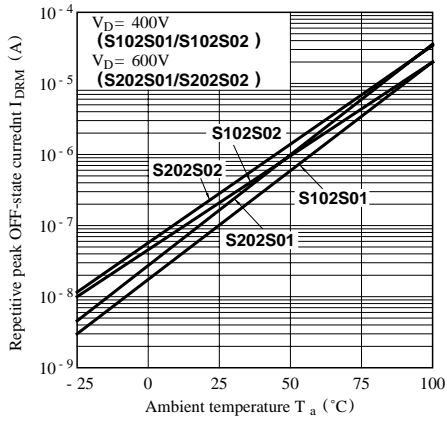
**Fig. 6 Maximum ON-state Power Dissipation vs. RMS ON-state Current (Typical Value)**



**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”

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