S112S01 Series
S116S01 Series

SIP Type SSR for Medium Power Control

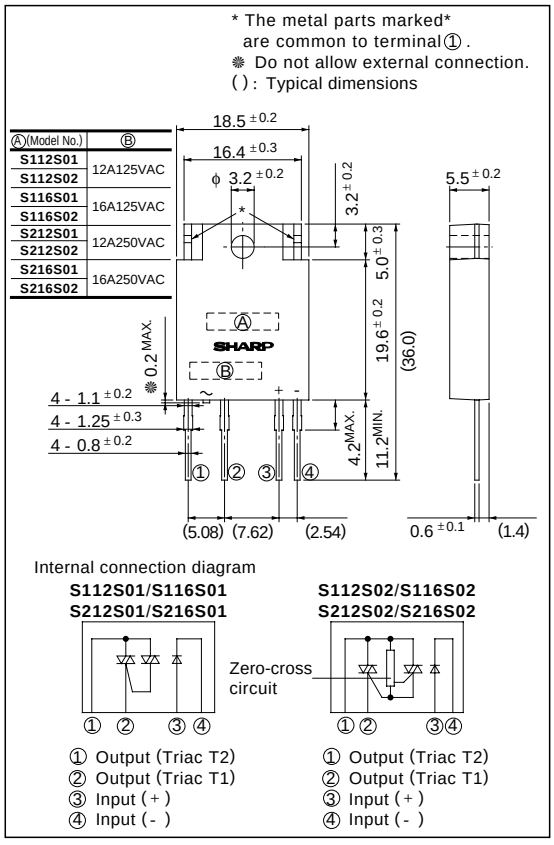
■ Features

1. Compact, high radiation resin mold package
2. RMS ON-state current
   S112S01 Series: 12Arms at T_C <= 70˚C (With heat sink)
   S116S01 Series: 16Arms at T_C <= 60˚C (With heat sink)
3. Built-in zero-cross circuit
   (S112S02 / S212S02 / S116S02 / S216S02)
4. High repetitive peak OFF-state voltage
   S112S01/ S112S02 / S116S01 / S116S02
   V_{DRM} : 400V
   S212S01 / S212S02 / S216S01 / S216S02
   V_{DRM} : 600V
5. Isolation voltage between input and output
   (V_{iso} : 4 000V_{rms})
6. Recognized by UL, file No. E94758
   S112S01 / S112S02
   S116S01 / S116S02
7. Approved by CSA, No. 63705
   S112S01 / S112S02
   S116S01 / S116S02

■ Applications

1. Copiers, laser beam printers
2. Automatic vending machines
3. FA equipment

■ Outline Dimensions (Unit : mm)



■ Model line-ups

	For 100V lines	For 200V lines
For phase control No built-in zero-cross circuit	**S112S01**	**S212S01**
	S116S01	**S216S01**
Built-in zero-cross circuit	**S112S02**	**S212S02**
	S116S02	**S216S02**

■ Absolute Maximum Ratings (Ta = 25˚C)

Parameter			Symbol	Rating	Unit
Input	Forward current		I_F	50	mA
	Reverse voltage		V_R	6	V
Output	RMS ON-state current	**S112S01 Series**	I_T	*4 12	A_{rms}
		S116S01 Series		*5 16	A_{rms}
	*1 Peak one cycle surge current	**S112S01 Series**	I_{surge}	120	A
		S116S01 Series		160	A
	Repetitive peak OFF-state voltage	**S112S01 / S112S02 S116S01 / S116S02**	V_{DRM}	400	V
		S212S01 / S212S02 S216S01 / S216S02		600	V
	Non-repetitive peak OFF-state voltage	**S112S01 / S112S02 S116S01 / S116S02**	V_{DSM}	400	V
		S212S01 / S212S02 S216S01 / S216S02		600	V
	Critical rate of rise of ON-state current		dI/dt	50	A/μ s
	Operating frequency		f	45 to 65	Hz
*2 Isolation voltage			V_{iso}	4 000	V_{rms}
Operating temperature			T_{opr}	- 25 to + 100	˚C
Storage temperature			T_{stg}	- 30 to + 125	˚C
*3 Soldering temperature			T_{sol}	260	˚C

*1 AC 60Hz sine wave, T_j = 25˚C start

*2 AC 60Hz 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.

*3 For 10 seconds

*4 T_C<=70˚C

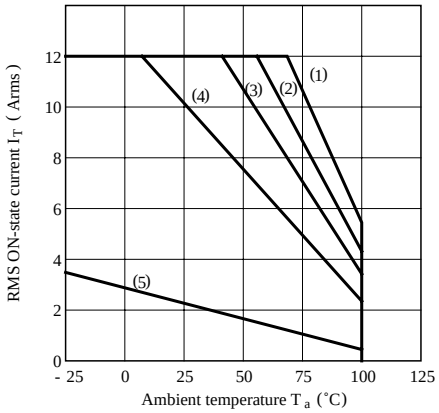
*5 T_C<=60˚C

■ Electrical Characteristics (Ta = 25˚C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F = 20mA	-	1.2	1.4	V
	Reverse current		I_R	V_R = 3V	-	-	10^{-4}	A
Output	Repetitive peak OFF-state current		I_{DRM}	$V_D = V_{DRM}$	-	-	10^{-4}	A
	ON-state voltage	**S112S01 Series**	V_T	Resistance load I_F = 20mA, I_T = 12Arms	-	-	1.5	V_{rms}
		S116S01 Series		Resistance load I_F = 20mA, I_T = 16Arms	-	-	1.5	V_{rms}
	Holding current		I_H	-	-	-	50	mA
	Critical rate of rise of OFF-state voltage		dV/dt	V_D = 2/3 • V_{DRM}	30	-	-	V/μ s
	Critical rate of rise of commutating OFF-state voltage		$(dV/dt)_C$	T_j = 125˚C, V_D = 400V, *6	5	-	-	V/μ s
	Zero-cross voltage	**S112S02 / S212S02 S116S02 / S216S02**	V_{OX}	I_F = 8mA	-	-	35	V
Transfer characteristics	Minimum trigger current	**S112S01 / S212S01 S116S01 / S216S01**	I_{FT}	V_D = 12V, R_L = 30Ω	-	-	8	mA
		S112S02 / S212S02 S116S02 / S216S02		V_D = 6V, R_L = 30Ω	-	-	8	mA
	Isolation resistance		R_{ISO}	DC500V, RH = 40 to 60 %	10^{10}	-	-	Ω
	Turn-on time	**S112S01 / S212S01 S116S01 / S216S01**	t_{on}	AC 50Hz	-	-	1	ms
		S112S02 / S212S02 S116S02 / S216S02			-	-	10	ms
	Turn-off time		t_{off}	AC 50Hz	-	-	10	ms
Thermal resistance (Between junction and case)		**S112S01 series**	$R_{th(j-c)}$	-	-	3.8	-	˚C/W
		S116S01 series		-	-	3.3	-	˚C/W
Thermal resistance (Between junction and ambience)			$R_{th(j-a)}$	-	-	40	-	˚C/W

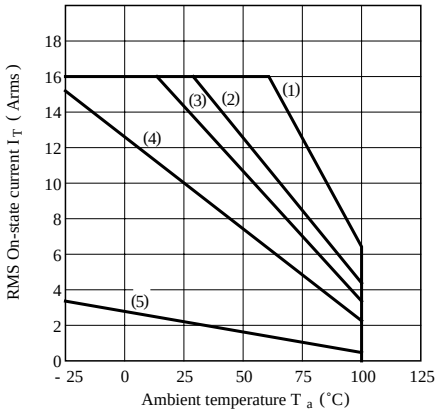
*6 **S112S01 Series**: dI_T/dt = - 6A/ms
S116S01 Series: dI_T/dt = - 8A/ms

Fig. 1 RMS ON-state Current vs. Ambient Temperature (S112S01Series)



(1) With infinite heat sink
(2) With heat sink (280 x 280 x 2 mm Al plate)
(3) With heat sink (200 x 200 x 2 mm Al plate)
(4) With heat sink (100 x 100 x 2 mm Al plate)
(5) Without heat sink

Fig. 2 RMS ON-state Current vs. Ambient Temperature (S116S01Series)



(1) With infinite heat sink
(2) With heat sink (280 x 280 x 2 mm Al plate)
(3) With heat sink (200 x 200 x 2 mm Al plate)
(4) With heat sink (100 x 100 x 2 mm Al plate)
(5) 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. 3 RMS ON-state Current vs. Case Temperature

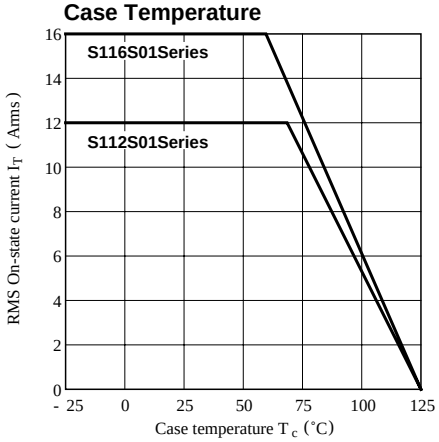


Fig. 4 Forward Current vs. Ambient Temperature

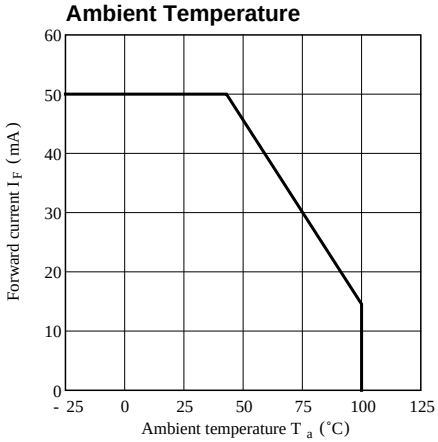


Fig. 5 Forward Current vs. Forward Voltage

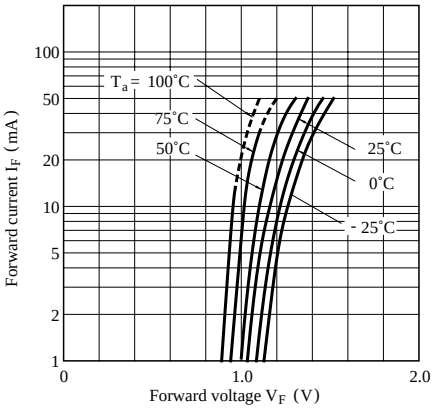


Fig. 6 Surge Current vs. Power-on Cycle

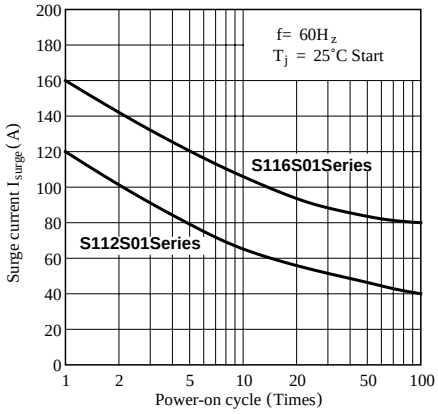


Fig. 7 Maximum ON-state Power Dissipation vs. RMS ON-state Current (S112S01Series)

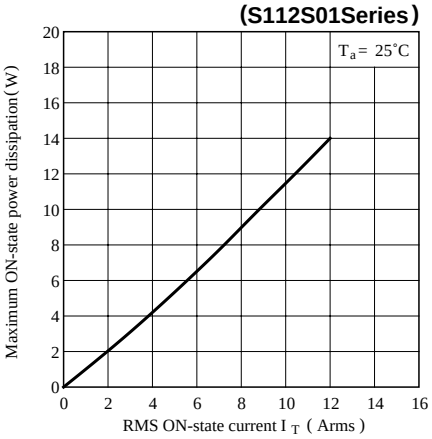


Fig. 8 Maximum ON-state Power Dissipation vs. RMS ON-state Current (S116S01Series)

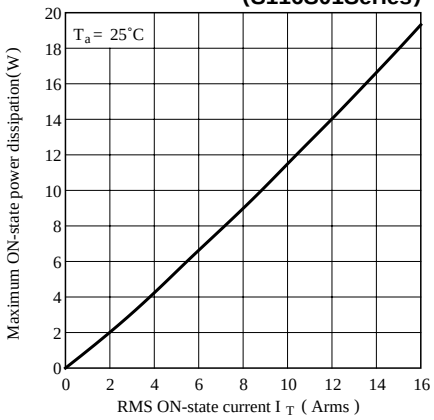


Fig. 9 Minimum Trigger Current vs. Ambient Temperature

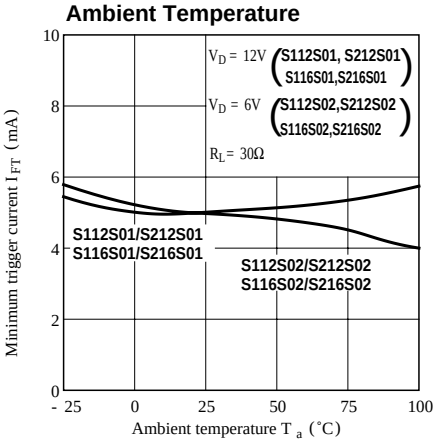


Fig.10 Repetitive Peak OFF-state Current vs. Ambient Temperature (S112S01/S112S02/S116S01/S116S02)

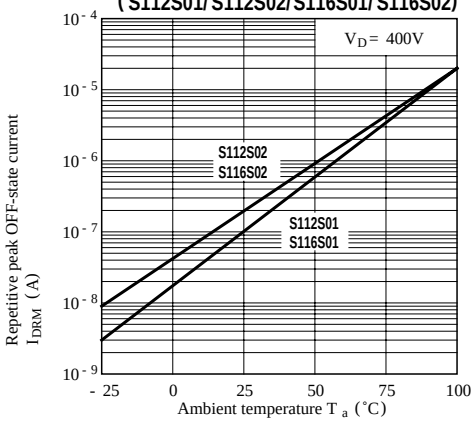
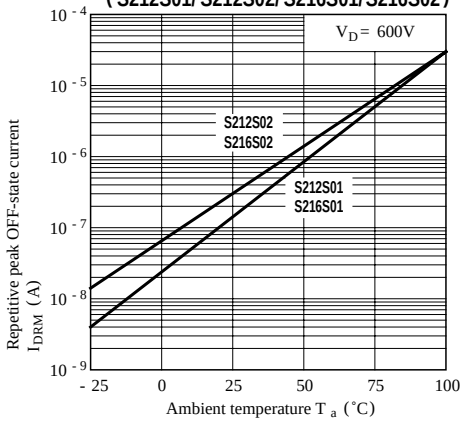


Fig.11 Repetitive Peak OFF-state Current vs. Ambient Temperature
（S212S01/ S212S02/ S216S01/ S216S02）



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