

S102S11/S102S12 S202S11/S202S12

SIP Type SSR with Snubber Circuit and Mounting Capability for External Heat Sink

■ Features

1. High radiation resin mold package
2. Built-in snubber circuit
3. Built-in zero-cross circuit
(S102S12/S202S12)
4. High repetitive peak OFF-state voltage
S102S11/S102S12 $V_{DRM} : 400V$
S202S11/S202S12 $V_{DRM} : 600V$
5. RMS ON-state current
 $I_T : \text{MAX. } 8A_{rms} \text{ at } T_c \leq 88^\circ C$
(With heat sink)
6. Isolation voltage between input and output
($V_{iso} : 4\,000V_{rms}$)
7. Recognized by UL, file No. E94758
Approved by CSA, No. LR63705

■ Applications

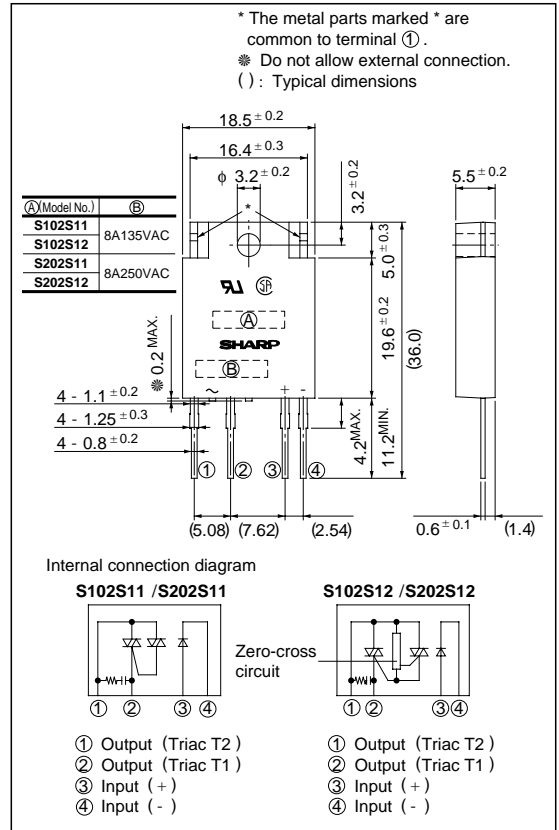
1. Automatic vending machines
2. Amusement equipment
3. Programmable controllers

■ Model line-ups

	For 100V lines	For 200V lines
Built-in snubber circuit	S102S11	S202S11
Built-in snubber circuit and zero-cross circuit	S102S12	S202S12

■ Outline Dimensions

(Unit : mm)



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	I _T	*48	A _{rms}	
	*1 Peak one cycle surge current	I _{surge}	80	A	
	Repetitive peak-OFF state voltage	S102S11/S102S12 S202S11/S202S12	V _{DRM}	400	V
				600	
	Non-repetitive peak-OFF state voltage	S102S11/S102S12 S202S11/S202S12	V _{DSM}	400	V
				600	
Critical rate of rise of ON-state current		dI _T /dt	50	A/μs	
*2 Isolation voltage		V _{iso}	4 000	V _{rms}	
Operating temperature		T _{opr}	- 20 to + 80	°C	
Storage temperature		T _{stg}	- 30 to + 100	°C	
*3 Soldering temperature		T _{sol}	260	°C	
Load supply voltage	S102S11/S102S12 S202S11/S202S12	V _{out}	135	V _{rms}	
			250		

*1 50Hz sine wave, start at T_j = 25°C

*2 60Hz AC for 1 minute, RH = 40 to 60%, 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 <= 88°C

Electro-optical 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	ON-state voltage	V _T	I _T = 2Arms	-	-	1.5	V _{rms}	
	Minimum Operating current	S102S11/S102S12 S202S11/S202S12	I _{op}	V _{out} = 120Vrms	-	-	50	mA _{rms}
				V _{out} = 240Vrms				
	Open circuit leak current	S102S11/S102S12 S202S11/S202S12	I _{leak}	V _{out} = 120Vrms	-	-	5	mA _{rms}
				V _{out} = 240Vrms	-	-	10	
	Critical rate of rise of OFF-state voltage		dV/dt	V _D = 2/3V _{DRM}	30	-	-	V/μs
	Critical rate of rise of Commutating OFF-state voltage		(dV/dt) _C	T _j = 125°C dI _T /dt = -4.0A/ms, *5	5	-	-	V/μs
Zero-cross voltage		S102S12/S202S12 V _{OX}	I _F = 8mA	-	-	35	V	
Transfer characteristics	Minimum trigger current	S102S11/S202S11 S102S12/S202S12	I _{FT}	V _D = 12V, R _L = 30Ω	-	-	8	mA
				V _D = 6V, R _L = 30Ω	-	-	8	mA
	Isolation resistance		R _{ISO}	DC500V, RH = 40 to 60%	10 ¹⁰	-	-	Ω
	Turn-on time	S102S11/S202S11 S102S12/S202S12	t _{on}	AC60Hz	-	-	1	ms
					-	-	9.3	ms
Turn-off time		t _{off}	AC60Hz	-	-	9.3	ms	
Thermal resistance (Between junction and case)		R _{th(j-c)}	-	-	4.0	-	°C/W	
Thermal resistance (Between junction and ambience)		R _{th(j-a)}	-	-	40	-	°C/W	

*5 S102S11/S102S12: V_D = 400V S202S11/S202S12: V_D = 600V

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

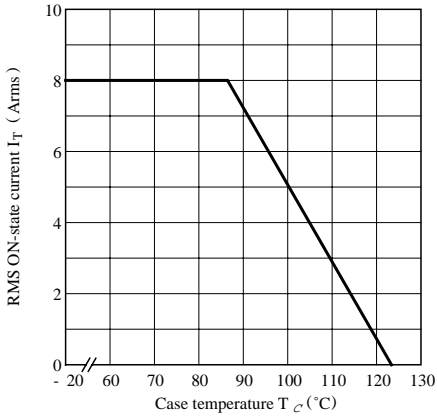


Fig. 2 RMS ON-state Current vs. Ambient Temperature

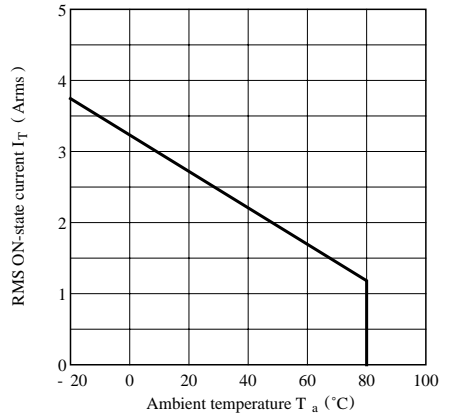


Fig. 3 Forward Current vs. Forward Voltage (Typical Value)

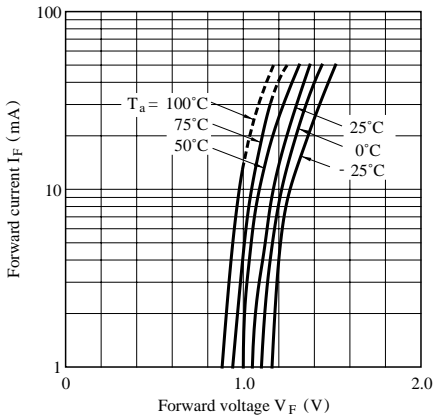


Fig. 4 Surge Current vs. Power-on Cycle

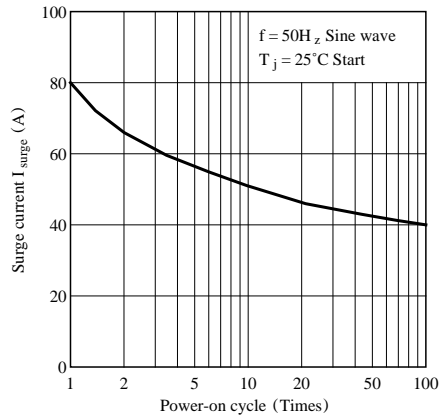


Fig. 5 Maximum ON-state Power Dissipation vs. RMS ON-state Current (Typical Value)

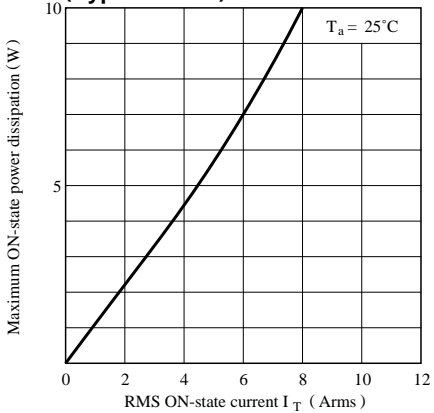


Fig. 6 Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S102S11/S202S11)

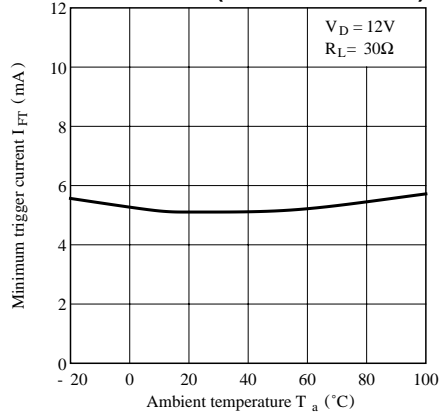


Fig. 7 Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S102S12 / S202S12)

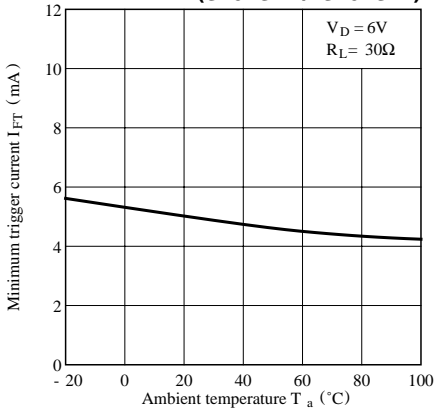


Fig. 8 Open Circuit Leak Current vs. Supply Voltage (Typical Value) (S102S11/S102S12)

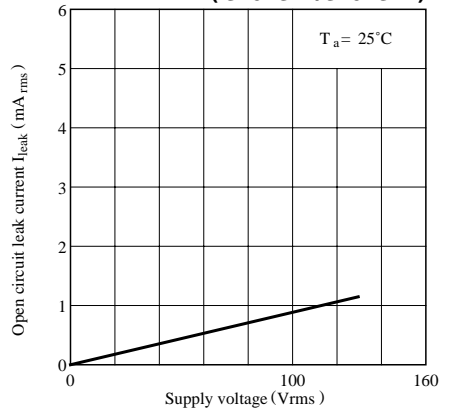
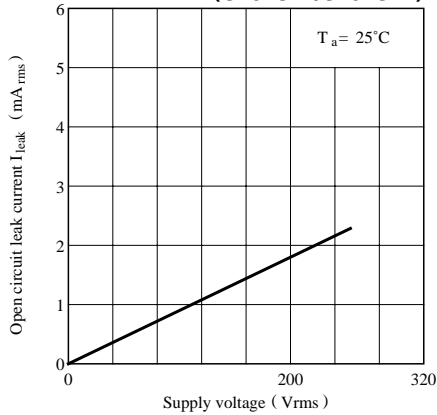


Fig. 9 Open Circuit Leak Current vs. Supply Voltage (Typical Value) (S202S11/S202S12)



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