

S102S11/S102S12 S202S11/S202S12

SIP Type SSR with Snubber Circuit and Mousing 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
 $I_T : \text{MAX. } 8\text{Arms at } T_c \leq 88^\circ\text{C}$
(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

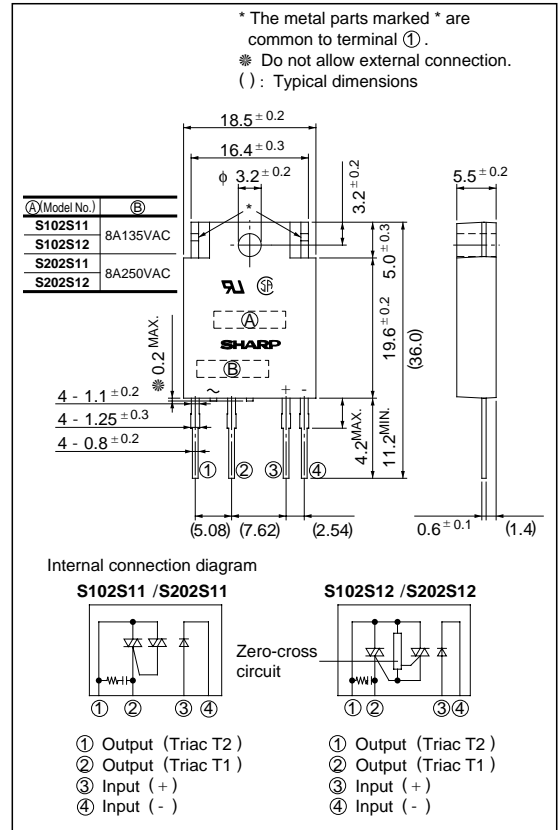
1. Automatic vending machines
2. Amusement equipment
3. Programmable controllers

■ 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 | V _{DRM} | 400 | V |
| | | S202S11/S202S12 | | 600 | |
| | Non-repetitive peak-OFF state voltage | S102S11/S102S12 | V _{DSM} | 400 | V |
| | | S202S11/S202S12 | | 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 | 135 | V _{rms} | |
| | | S202S11/S202S12 | 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 | I _{op} | V _{out} = 120V _{rms} | - | - | 50 | mA _{rms} | |
| | | | V _{out} = 240V _{rms} | | | | | |
| | Open circuit leak current | I _{leak} | V _{out} = 120V _{rms} | - | - | 5 | mA _{rms} | |
| | | | V _{out} = 240V _{rms} | | | | | |
| | 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 | 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 | 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

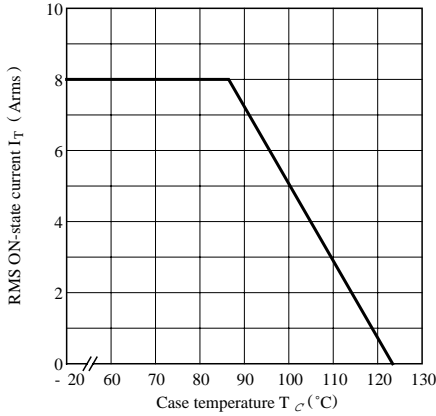


Fig. 2 RMS ON-state Current vs. Ambient Temperature

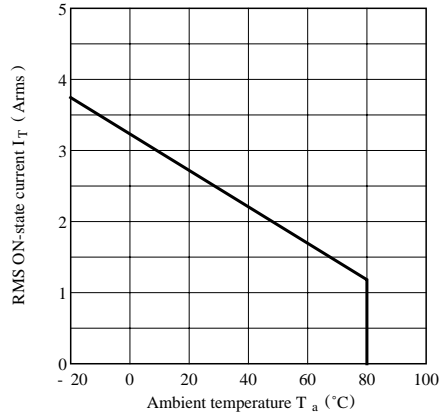


Fig. 3 Forward Current vs. Forward Voltage (Typical Value)

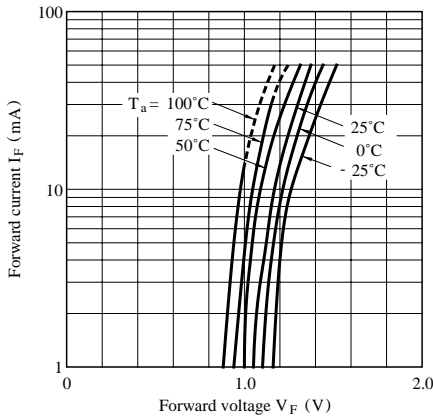


Fig. 4 Surge Current vs. Power-on Cycle

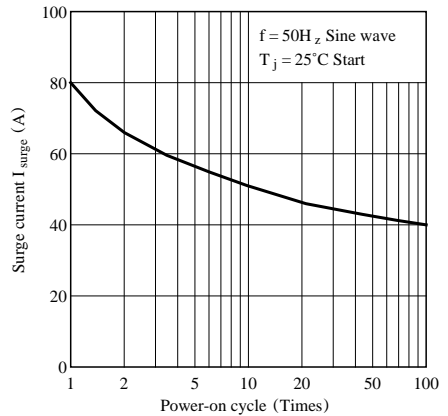


Fig. 5 Maximum ON-state Power Dissipation vs. RMS ON-state Current (Typical Value)

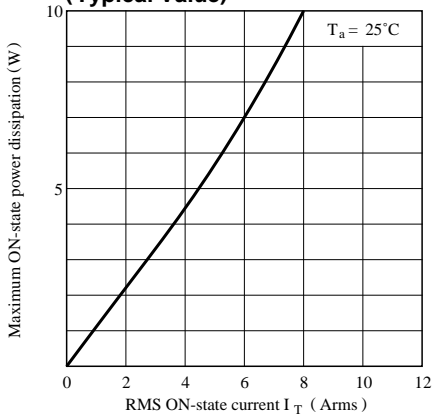


Fig. 6 Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S102S11/S202S11)

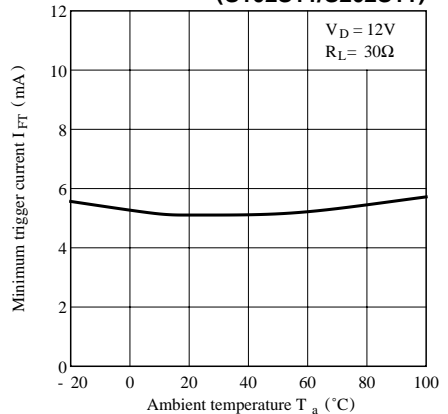


Fig. 7 Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S102S12/ S202S12)

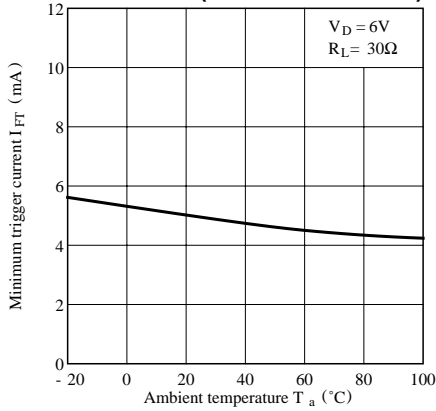


Fig. 8 Open Circuit Leak Current vs. Supply Voltage (Typical Value) (S102S11/S102S12)

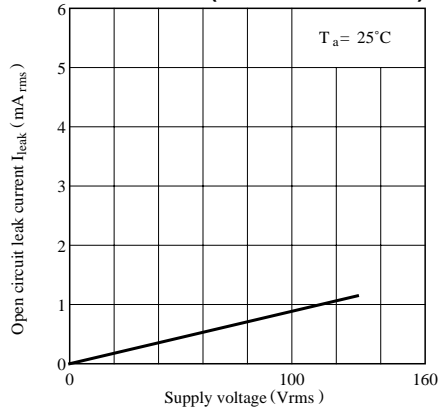
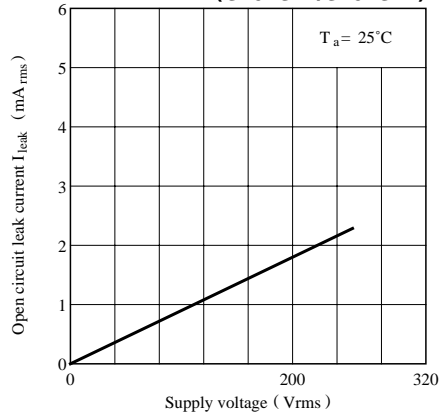


Fig. 9 Open Circuit Leak Current vs. Supply Voltage (Typical Value) (S202S11/S202S12)



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