# S101S15V/S101S16V S201S15V/S201S16V

## SIP Type SSR with Built-in Snubber Circuit

### ■ Features

1. High radiation resin mold package
   $I_T$: MAX. 3A $_{rms}$
2. Isolation voltage between input and output
   $V_{iso}$: 3 000 $V_{rms}$
3. Built-in zero-cross circuit
   (S101S16V/ S201S16V)
4. Built-in snubber circuit
5. Recognized by UL, file No. E94758
   Approved by CSA, file No. LR63705

### ■ Applications

1. Air conditioners
2. OA equipment

### ■ Model Line-ups

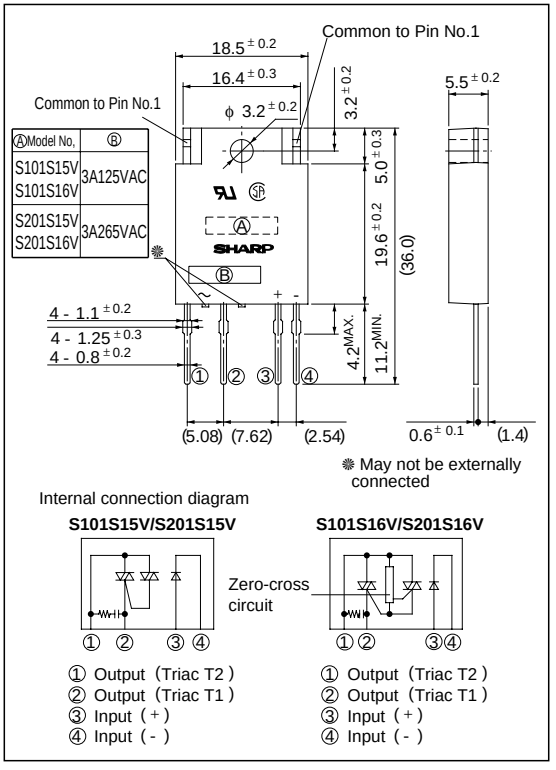
| | For 100V lines | For 200V lines |
|---|---|---|
| No built-in zero-cross circuit | **S101S15V** | **S201S15V** |
| Built-in zero-cross circuit | **S101S16V** | **S201S16V** |

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

| Parameter | | Symbol | Ratings | | Unit |
|---|---|---|---|---|---|
| | | | 100V line | 200V line | |
| Input | Forward current | $I_F$ | 50 | | mA |
| | Reverse current | $V_R$ | 6 | | V |
| Output | RMS ON-state current | $I_T$ | 3 ($T_C$<=100˚C) | | A $_{rms}$ |
| | *1 Peak one cycle surge current | $I_{surge}$ | 30 | | A |
| | Repetitive peak OFF-state voltage | $V_{DRM}$ | 400 | 600 | V |
| | Critical rate of rise of ON-state current | $dI_T/dt$ | 40 | | A/μ s |
| | Operating frequency | f | 45 to 65 | | H $_Z$ |
| Operating temperature | | $T_{opr}$ | - 20 to + 80 | | ˚C |
| Storage temperature | | $T_{stg}$ | - 30 to + 100 | | ˚C |
| *2 Isolation voltage | | $V_{iso}$ | 3.0 | | kV $_{rms}$ |
| *3 Soldering temperature | | $T_{sol}$ | 260 | | ˚C |

*1 60H $_Z$ sine wave, $T_j$ = 25˚C
*2 AC 60Hz for 1 minute, 40 to 60% RH
Isolation voltage measuring method:
(1) Dielectric withstand tester, with zero-cross circuit shall be used.
(2) The waveform of applied voltage shall be sine wave.
(3) It shall be applied voltage between input and output.
(Input and output shall be short-circuited respectively)
*3 For 10 seconds

### ■ Outline Dimensions (Unit : mm)



## ■ Electrical Characteristics

(Ta = 25˚C)

| Parameter | | | Symbol | Condition | 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 | | $V_T$ | Resistance load, $I_F$ = 20mA, $I_T$ = 1.5A rms | - | - | 1.5 | V rms |
| | Minimum operating current | S101S15V/16V | $I_{OP}$ | $V_{OUT}$ = 120V rms | - | - | 50 | mA rms |
| | | S201S15V/16V | | $V_{OUT}$ = 240V rms | | | | |
| | Open circuit leak current | S101S15V/16V | $I_{leak}$ | $V_{OUT}$ = 120V rms | - | - | 5 | mA rms |
| | | S201S15V/16V | | $V_{OUT}$ = 240V rms | - | - | 10 | |
| | Critical rate of rise of OFF-state voltage | | dV/dt | $V_D$ = 2/3V $_{DRM}$ | 30 | - | - | V/μ s |
| | Commutation critical rate of rise of OFF-state voltage | | (dV/dt)c | $T_j$ = 125˚C, $V_D$= 400V, $dI_T/d_t$ = -1.5A/ms | 4 | - | - | V/μ s |
| Transfer characteristics | Minimum trigger current | S101S15V/S201S15V | $I_{FT}$ | $V_D$ = 12V, $R_L$ = 30Ω | - | - | 15 | mA |
| | | S101S16V/S201S16V | | $V_D$ = 6V, $R_L$ = 30Ω | | | | |
| | Isolation resistance | | $R_{ISO}$ | DC500V, $R_H$ = 40 to 60% | $10^{10}$ | - | - | Ω |
| | Zero-cross voltage | S101S16V | $V_{OX}$ | $I_F$ = 15mA | - | - | 35 | V |
| | | S201S16V | | | - | - | 35 | |
| | Turn-on time | S101S15V/S201S15V | ton | AC50H $_Z$ | - | - | 1 | ms |
| | | S101S16V/S201S16V | | | - | - | 10 | |
| | Turn-off time | | toff | AC50H $_Z$ | - | - | 10 | ms |
| | Thermal resistance Between junction and case | | $R_{th\ (j-c)}$ | - | - | 6 | - | ˚C/W |
| | Thermal resistance Between junction and ambient | | $R_{th\ (j-a)}$ | - | - | 45 | - | ˚C/W |

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

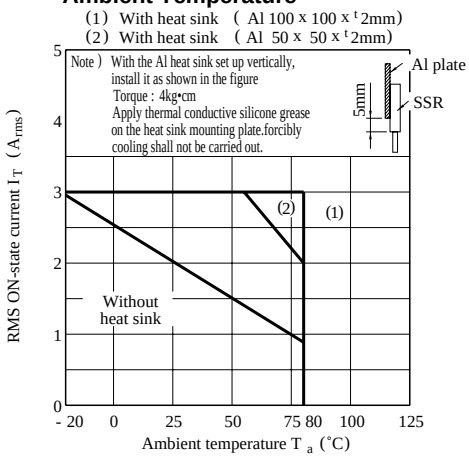



**Fig. 2 RMS ON-state Current vs. Case Temperature**

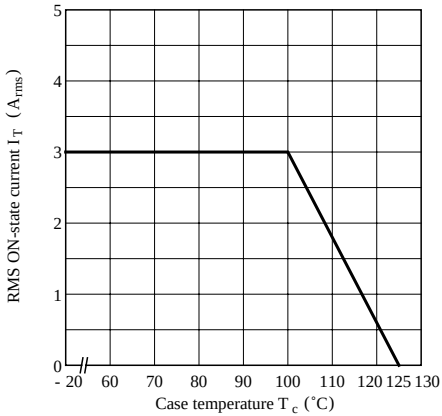


**Fig. 3 Forward Current vs. Ambient Temperature**

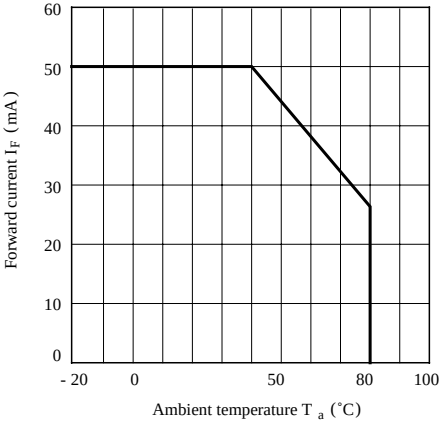



**Fig. 5 Forward Current vs. Forward Voltage**

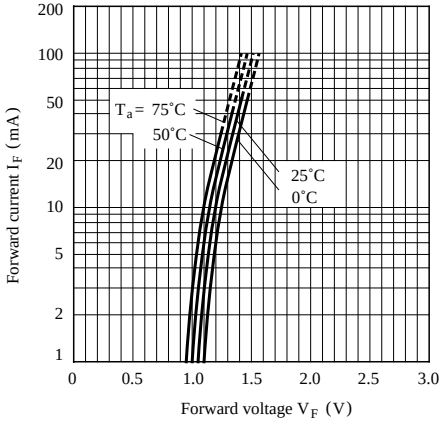



**Fig. 5 Surge Current vs. Power-on cycle**

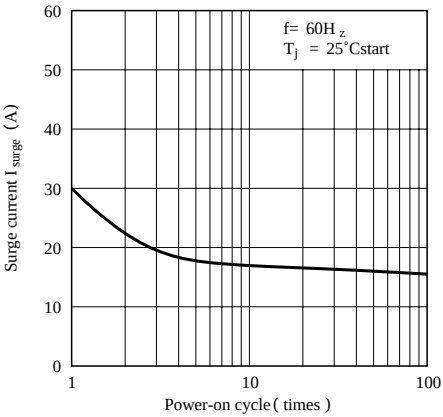



**Fig. 6 Maximum ON-state Power Dissipation vs. RMS ON-state Current (Typical Value)**

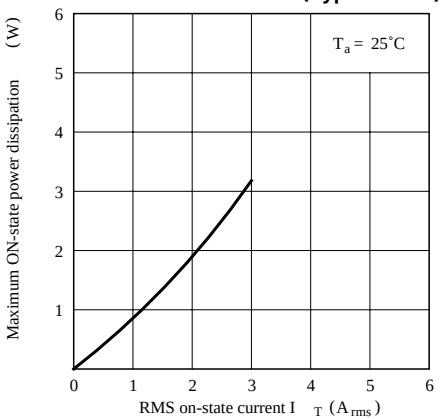



**Fig. 7-a Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S101S15V/S201S15V)**

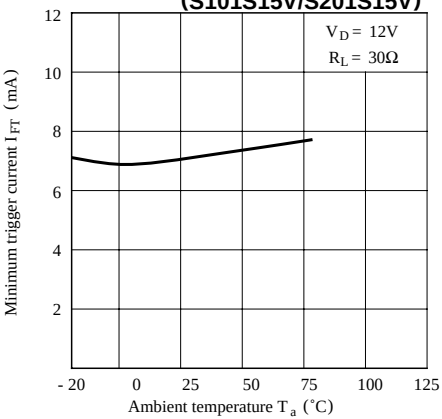



**Fig. 7-b Minimum Trigger Current vs. Ambient Temperature (Typical Value) (S101S16V/S201S16V)**

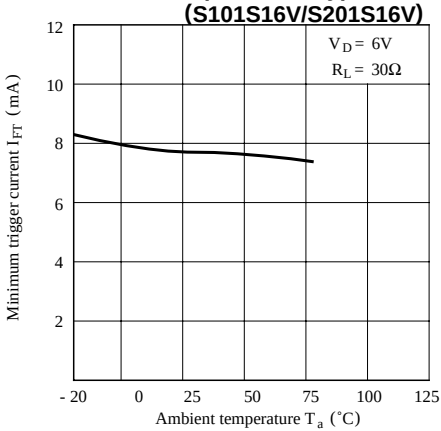


**Fig. 8-a Open Circuit Leak Current vs. Supply Voltage（Typical Value）(S101S15V, S101S16V)**

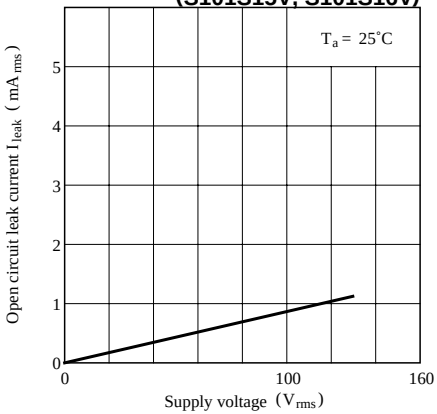
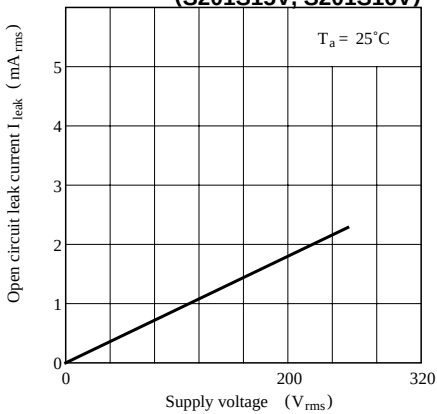



**Fig. 8-b Open Circuit Leak Current vs. Supply Voltage（Typical Value）(S201S15V, S201S16V)**




● Please refer to the chapter " Precautions for Use."