

S13MD01

8-pin DIP Type SSR for Low Power Control

■ Features

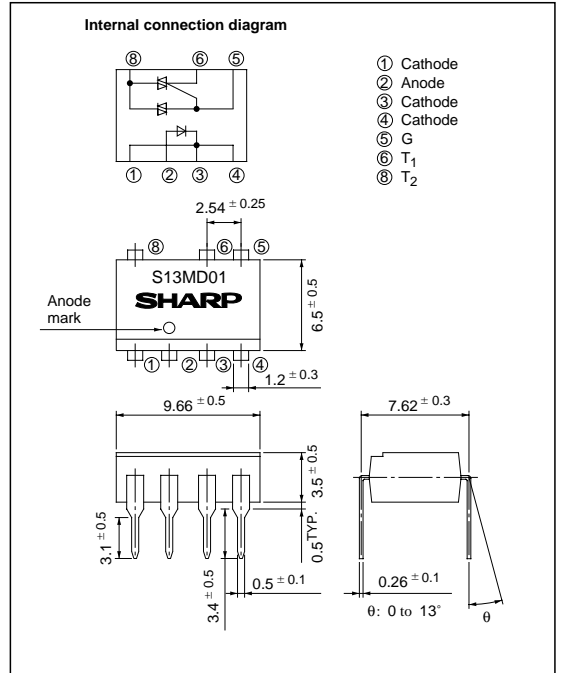
1. Compact 8-pin dual-in-line package
2. RMS ON-state current (I_T : 0.3Arms)
3. Repetitive peak OFF-state voltage is high.
4. Isolation voltage between input and output (Viso : 4000Vrms)
5. Recognized by UL (No. E94758)
6. Approved by CAS (No. LR63705)

■ Application

1. Oil fan heaters
2. Microwave ovens
3. Refrigerators

■ Outline Dimensions

(Unit : mm)



* (Note) Terminals ①, ③ and ④ are common ones of cathode.

To radiate the heat, solder all of the lead pins on the pattern of PWB.

■ 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 | 0.3 | A _{rms} |
| | *1 Peak one cycle surge current | I_{surge} | 3 | A |
| | Repetitive peak OFF-state voltage | V_{DRM} | 400 | V |
| | *2 Isolation voltage | V_{iso} | 4 000 | V _{rms} |
| Operating temperature | | T_{opr} | - 25 to +80 | °C |
| Storage temperature | | T_{sig} | - 40 to +125 | °C |
| *3 Soldering temperature | | T_{sol} | 260 | °C |

*1 50Hz sine wave

*2 40 to 60% RH, AC for 1 minute, f=60Hz

*3 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 | μA |
| Output | Repetitive peak OFF-state current | I_{DRM} | $V_{DRM} = \text{Rated}$ | - | - | 100 | μA |
| | ON-state voltage | V_T | $I_T = 0.3\text{A}$ | - | - | 3.0 | V |
| | Holding current | I_H | $V_D = 6\text{V}$ | - | - | 25 | mA |
| | Critical rate of rise of OFF-state voltage | dv/dt | $V_{DRM} = (1/\sqrt{2}) \cdot \text{Rated}$ | 100 | - | - | $\text{V}/\mu\text{s}$ |
| Transfer characteristics | Minimum trigger current | I_{FT} | $V_D = 6\text{V}, R_L = 100\Omega$ | - | - | 10 | mA |
| | Insulation resistance | R_{ISO} | DC500V, 40 to 60% RH | 5×10^{10} | 1×10^{11} | - | Ω |
| | Turn-on time | t_{on} | $V_D = 6\text{V}, R_L = 100\Omega$ $I_F = 20\text{mA}$ | - | - | 100 | μs |

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

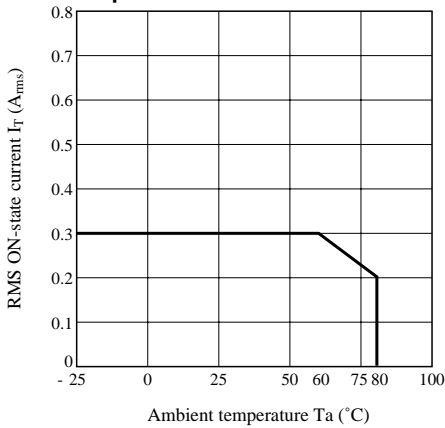


Fig. 2 Forward Current vs. Ambient Temperature

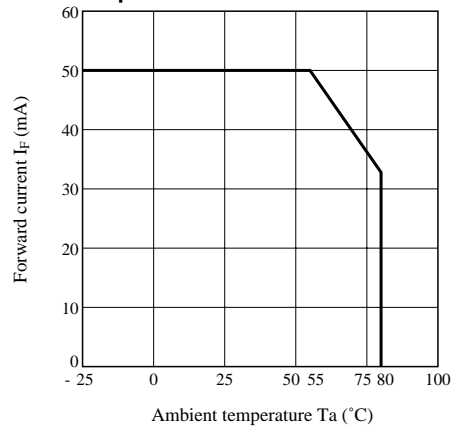


Fig. 3 Forward Current vs. Forward Voltage

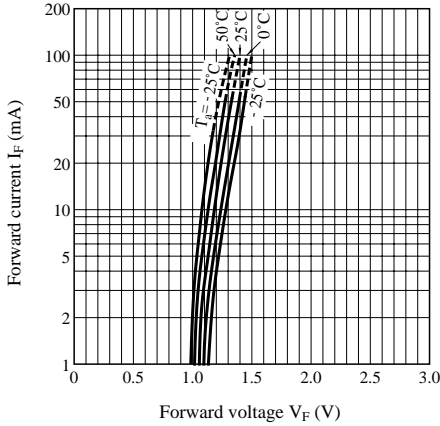


Fig. 4 Minimum Trigger Current vs. Ambient Temperature (S13MD01)

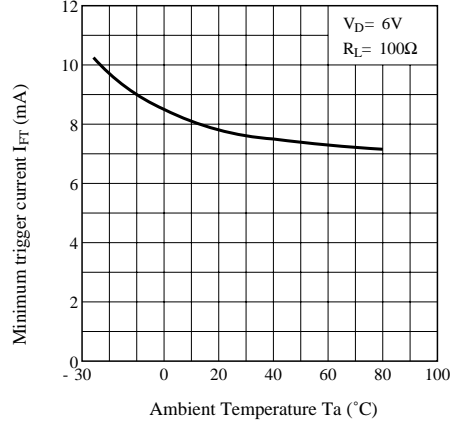


Fig. 5 ON-State Voltage vs. Ambient Temperature (S13MD01)

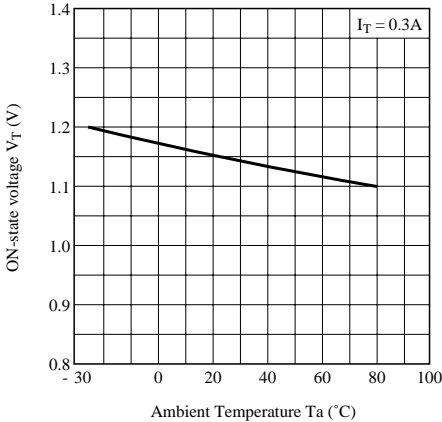


Fig. 6 Relative Holding Current vs. Ambient Temperature (S13MD01)

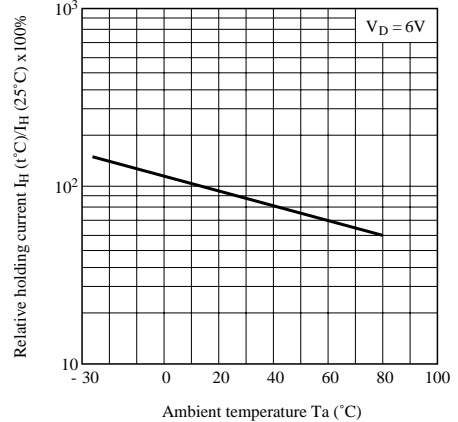


Fig. 7 ON-State Current vs. ON-State Voltage (S13MD01)

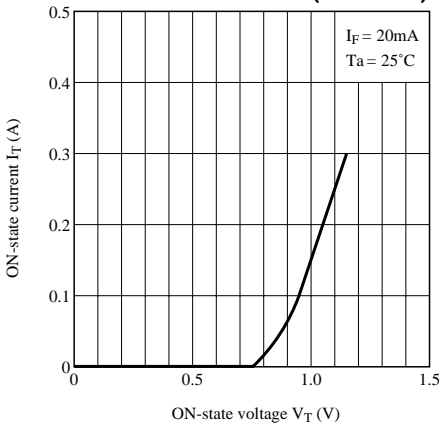
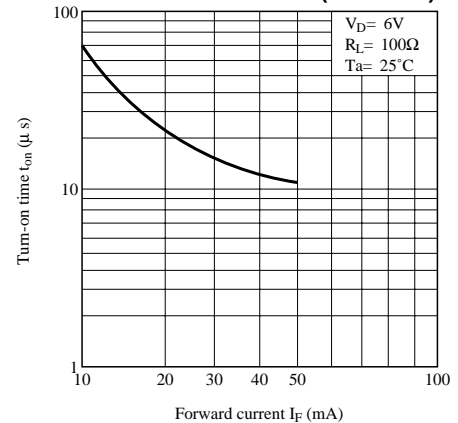
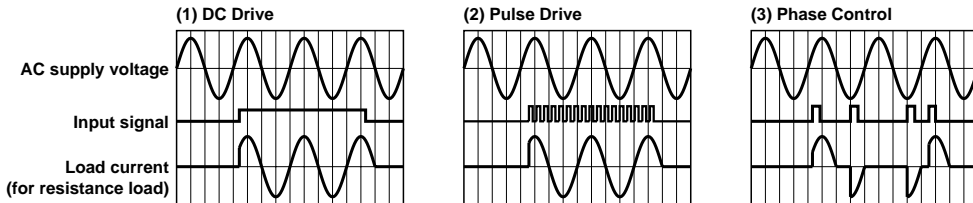
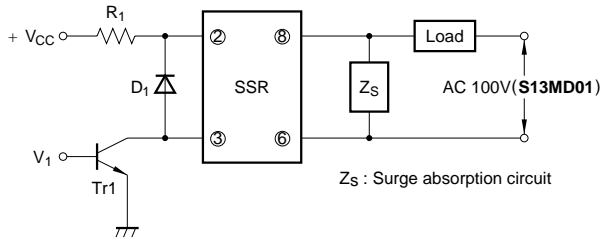


Fig. 8 Turn-on Time vs. Forward Current (S13MD01)



Basic Operation Circuit



Notes (1) If large amount of surge is loaded onto V_{CC} or the driver circuit, add a diode D_1 between terminals 2 and 3 to prevent reverse bias from being applied to the infrared LED.

(2) Be sure to install a surge absorption circuit. An appropriate circuit must be chosen according to the load (for CR, choose its constant). This must be carefully done especially for an inductive load.

(3) For phase control, adjust such that the load current immediately after the input signal is applied will be more than 30mA.

Precautions for Use

(1) All pins must be soldered since they are also used as heat sinks (heat radiation fins).

In designing, consider the heat radiation from the mounted SSR.

(2) For higher radiation efficiency that allows wider thermal margin, secure a wider round pattern for Pin No. 8

when designing mounting pattern. The rounded part of Pin No. 5 (gate) must be as small as possible.

Pulling the gate pattern around increases the change of being affected by external noise.

● As for other general cautions, refer to the chapter "Precautions for Use" (Page 78 to 93).