S101D01/S101D02 S201D01/S201D02

16-Pin DIP Type SSR for Low Power Control

■ Features

1. Compact
   (16-pin dual-in-line package type)
2. RMS ON-state current I_T : 1.2Arms
3. Built-in zero-cross circuit
   (S101D02 , S201D02)
4. Recognised by UL, file No. E94758
5. Approved by CSA, No. LR63705

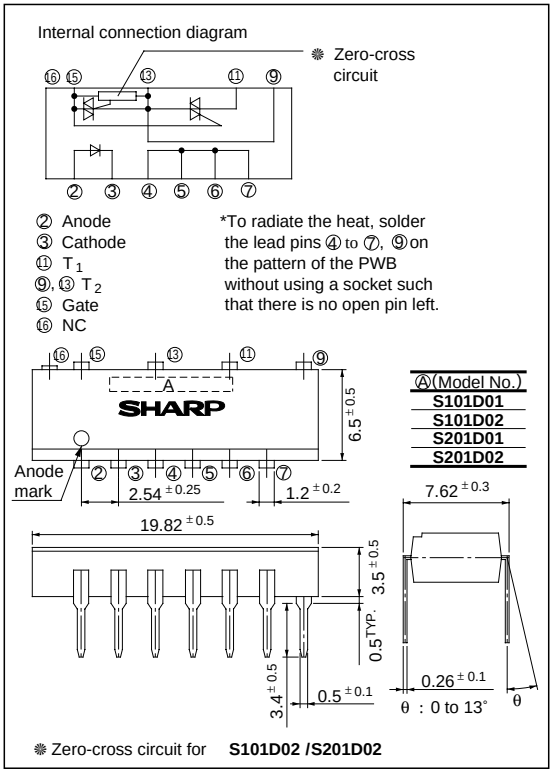
■ Applications

1. Fan heaters
2. Microwave ovens
3. Refrigerators
4. Air conditioners

■ Model Line-ups

	For 100V lines	For 200V lines
For phase control No built-in zero-cross circuit	**S101D01**	**S201D01**
Built-in zero-cross circuit	**S101D02**	**S201D02**

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (Ta = 25°C)

Parameter		Symbol	Rating		Unit
			S101D01/S101D02	S201D01/S201D02	
Input	Forward current	I_F	50		mA
	Reverse voltage	V_R	6		V
Output	RMS ON-state current	I_T	1.2		A_{rms}
	*1 Peak one cycle surge current	I_{surge}	12		A
	Repetitive peak OFF-state voltage	V_{DRM}	400	600	V
*2 Isolation voltage		V_{iso}	4 000		V_{rms}
Operating temperature		T_{opr}	- 25 to + 85		°C
Storage temperature		T_{stg}	- 40 to + 125		°C
*3 Soldering temperature		T_{sol}	260		°C

*1 50Hz, sine wave
*2 40 to 60% RH, AC 60Hz for 1 minute
*3 For 10 seconds

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■ 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^{-5}	A
Output	Repetitive peak OFF-state current	**S101D01 / S101D02**	I_{DRM}	V_{DRM} = 400V	-	-	10^{-4}	A
		S201D01 / S201D02		V_{DRM} = 600V	-	-	10^{-4}	A
	ON-state voltage		V_T	I_T = 1.2A	-	-	1.7	V
	Holding current		I_H	V_D = 6V	-	-	25	mA
	Zero-cross voltage	**S101D02 / S201D02**	V_{OX}	Resistance load, I_F = 15mA	-	-	35	V
	Critical rate of rise of OFF-state voltage	**S101D01 / S101D02**	dV/dt	V_{DRM} = 1/$\sqrt{2}$ • 400V	200	-	-	V/μs
		S201D01 / S201D02		V_{DRM} = 1/$\sqrt{2}$ • 600V	100	-	-	V/μs
Transfer characteristics	Minimum trigger current		I_{FT}	V_D = 6V, R_L = 100Ω	-	-	10	mA
	Isolation resistance		R_{ISO}	DC500V, 40 to 60% RH	5×10^{10}	10^{11}	-	Ω
	Turn-on time		t_{on}	V_D = 6V, R_L = 100Ω, I_F = 20mA	-	-	100	μs

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

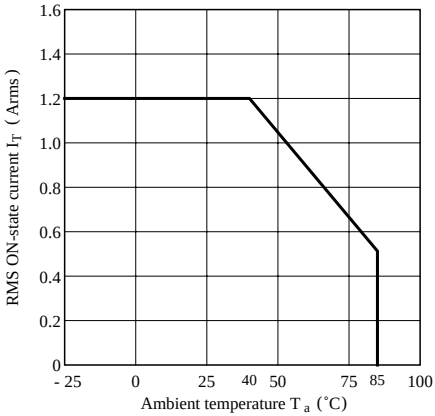


Fig. 2 Forward Current vs. Ambient Temperature

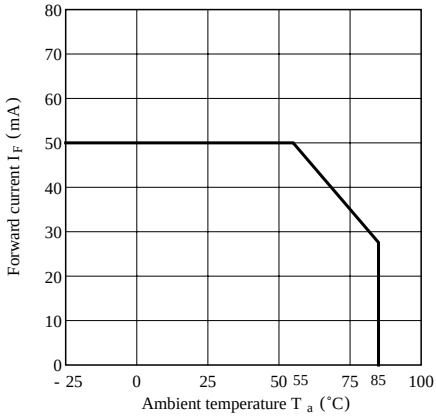


Fig. 3 Forward Current vs. Forward Voltage

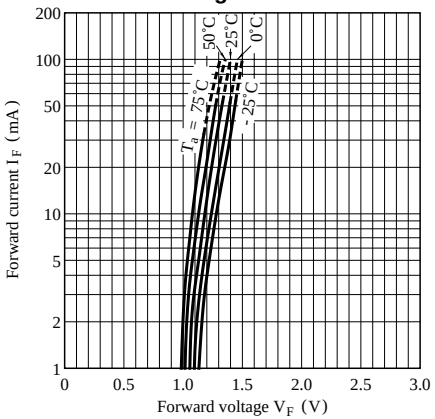


Fig. 4 Minimum Trigger Current vs. Ambient Temperature (S101D01)

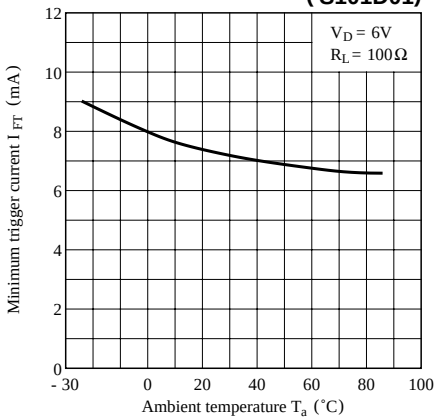


Fig. 5 Minimum Trigger Current vs. Ambient Temperature (S101D02 , S201D02)

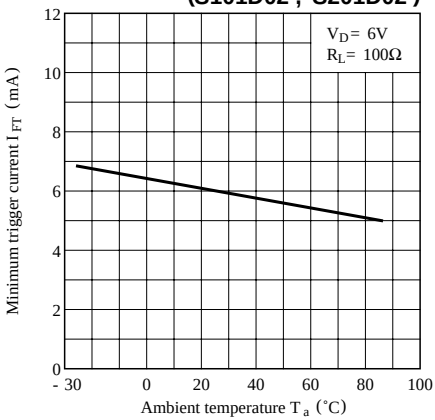


Fig. 6 Minimum Trigger Current vs. Ambient Temperature (S201D01)

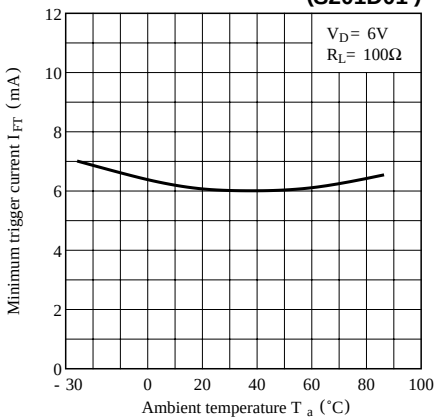


Fig. 7 ON-state Voltage vs. Ambient Temperature

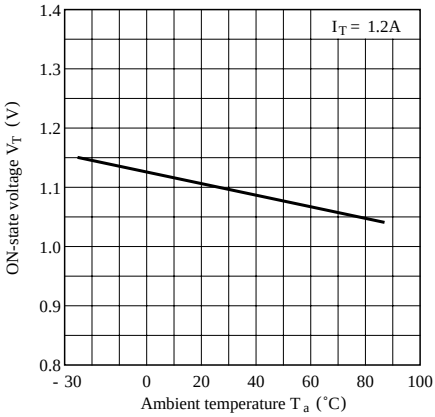


Fig. 8 Relative Holding Current vs. Ambient Temperature

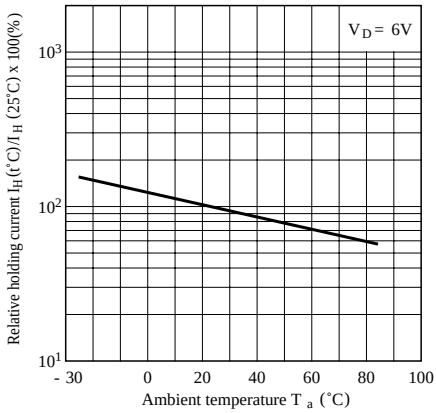


Fig. 9 ON-state Current vs. ON-state Voltage

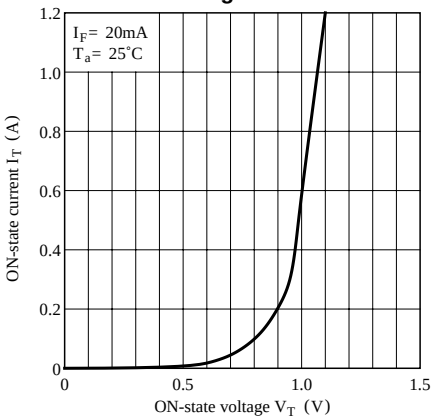


Fig.10 Turn-on Time vs. Forward Current (S101D01)

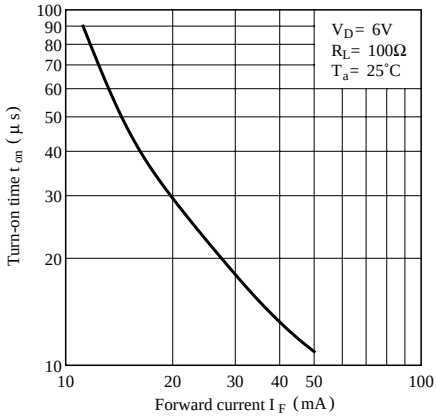


Fig.11 Turn-on Time vs. Forward Current (S101D02 , S201D02)

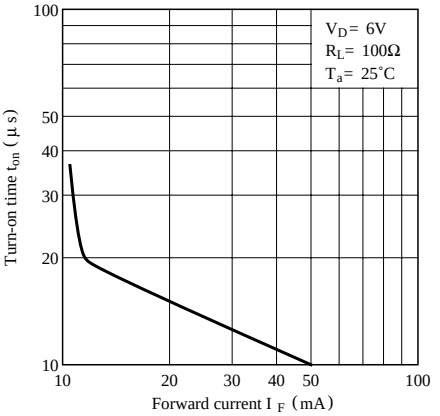
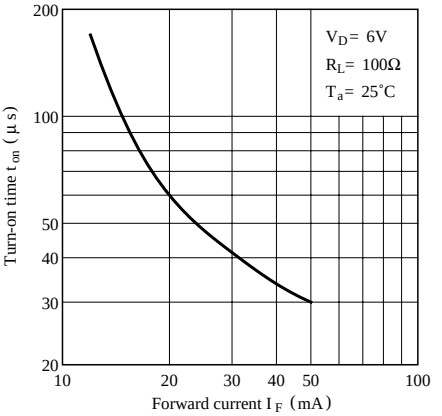
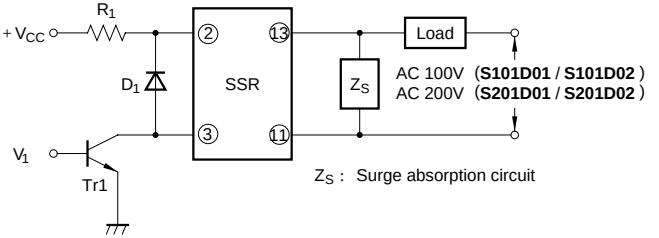
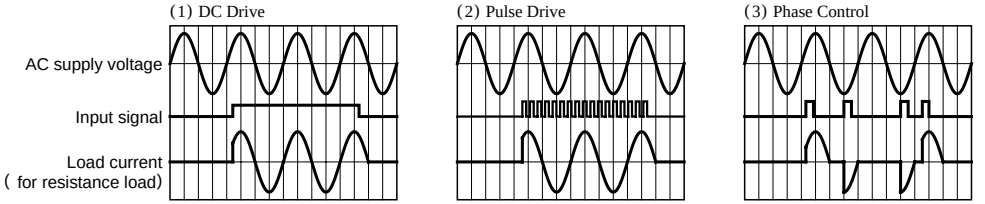


Fig.12 Turn-on Time vs. Forward Current (S201D01)



■ 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 60mA.

(Precautions for Use)

1) All pins must be soldered since they are also used as heat sinks (heat radiation fins). In designing, take into the heat radiation from the mounted SSR.
2) For higher radiation efficiency that allows wider thermal margin, secure a wider round pattern for Pin 13 when designing mounting pattern. The rounded part of Pin 15 (gate) must be as small as possible. Pulling the gate pattern around increases the change of being affected by external noise.
3) As for other general cautions, refer to the chapter " Precautions for Use "

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— Telecommunication equipment [terminal]
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— Consumer electronics

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