

# S11MA01/S21MA01

## 6-pin DIP Type SSR for Low Power Control

### ■ Features

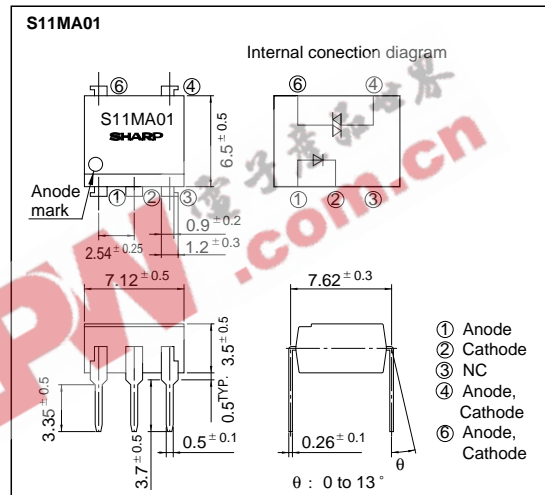
1. Low operating current type  
(MAX 60mA<sub>rms</sub>)
2. Compact 5-pin dual-in-line package type
3. Recognized by UL file No. E94758

### ■ Applications

1. Electrical dampers for refrigerator
2. Turntable controllers for microwave oven
3. Ignitions circuit for oil fan heater

### ■ Outline Dimensions

(Unit : mm)



### ■ Absolute Maximum Ratings

(T<sub>a</sub> = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	50	mA
	Reverse voltage	V <sub>R</sub>	6	V
Output	RMS ON-state current	I <sub>T</sub>	100	mA <sub>rms</sub>
	<sup>*1</sup> Peak one cycle surge current	I <sub>surge</sub>	1.2	A
	Repetitive peak OFF-state voltage	V <sub>DRM</sub>	400	V
		V <sub>DRM</sub>	600	V
<sup>*2</sup> Isolation voltage		V <sub>iso</sub>	5 000	V <sub>rms</sub>
Operating temperature		T <sub>opr</sub>	- 25 to + 80	°C
Storage temperature		T <sub>stg</sub>	- 55 to + 125	°C
<sup>*3</sup> Soldering temperature		T <sub>sol</sub>	260	°C

\*1 50Hz sine wave

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

\*3 For 10 seconds

■ Electro-optical Characteristics

(T<sub>a</sub> = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 20mA	-	1.2	1.4	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 3V	-	-	10 <sup>-5</sup>	A
	Repetitive peak OFF-state voltage	I <sub>DRM</sub>	V <sub>DRM</sub> = Rated	-	-	10 <sup>-6</sup>	A
Output	ON-state voltage	V <sub>T</sub>	I <sub>T</sub> = 0.06A	-	-	2.5	V
	Holding current	I <sub>H</sub>	V <sub>D</sub> = 6V	0.1	1.0	3.5	mA
	Critical rate of rise of OFF-state voltage	dV/dt	V <sub>DRM</sub> = (1/√2) • Rated	500	-	-	V/μs
	Operating current	S11MA01 S21MA01	-	-	-	60	mA <sub>rms</sub>
Transfer characteristics	Minimum trigger current	I <sub>FT</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 100 Ω	-	-	10	mA
	Isolation resistance	R <sub>ISO</sub>	DC = 500V, 40 to 60% RH	5 × 10 <sup>10</sup>	10 <sup>11</sup>	-	Ω
	Turn-on time	t <sub>on</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 100Ω, I <sub>F</sub> = 20mA	-	-	100	μs

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

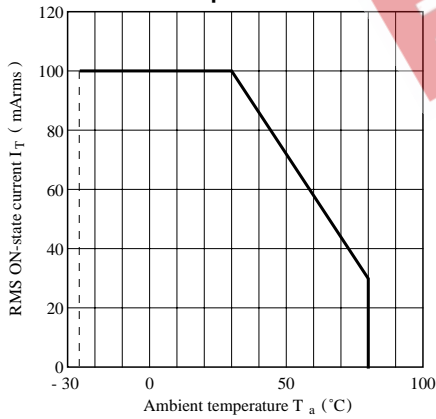


Fig. 2 Forward Current vs. Ambient Temperature

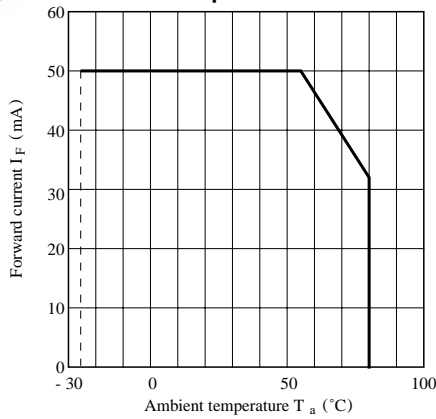


Fig. 3 Operating Current vs. Ambient Temperature

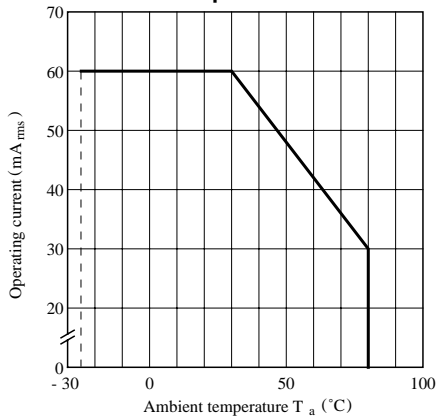
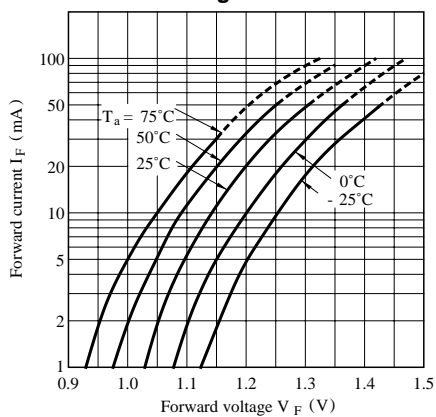
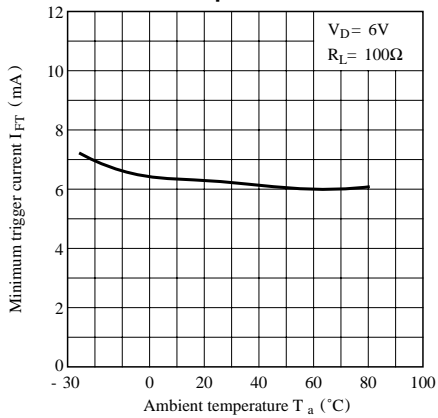


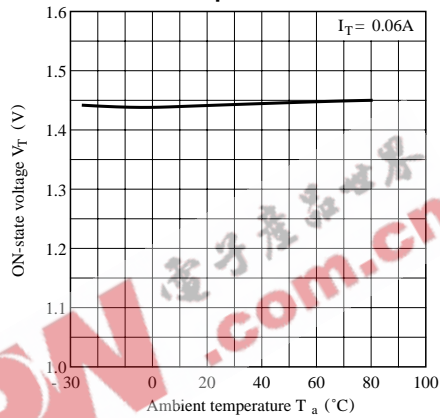
Fig. 4 Forward Current vs. Forward Voltage



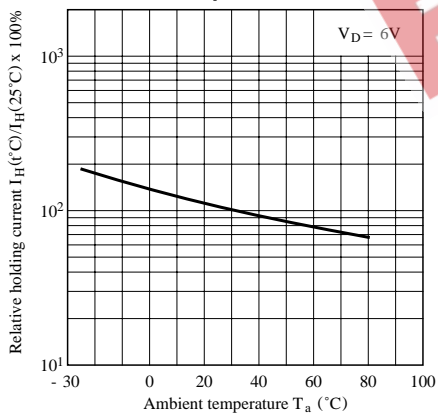
**Fig. 5 Minimum Trigger Current vs. Ambient Temperature**



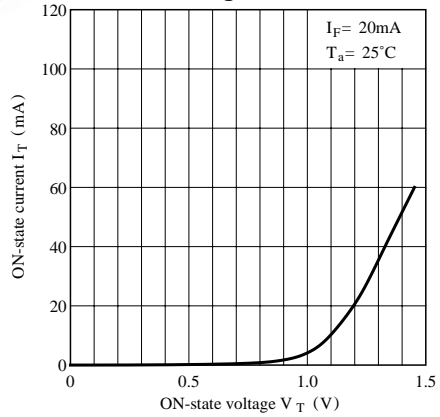
**Fig. 6 ON-state Voltage vs. Ambient Temperature**



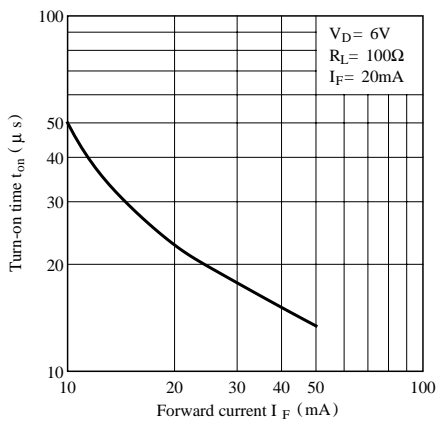
**Fig. 7 Relative Holding Current vs. Ambient Temperature**



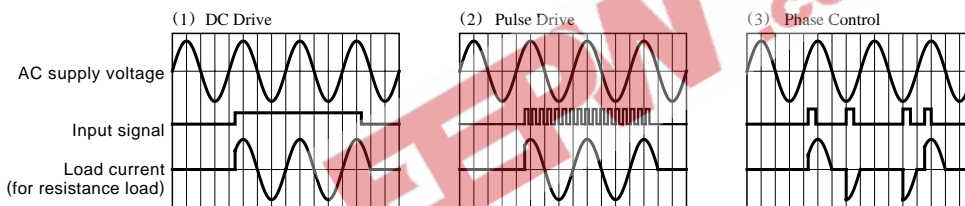
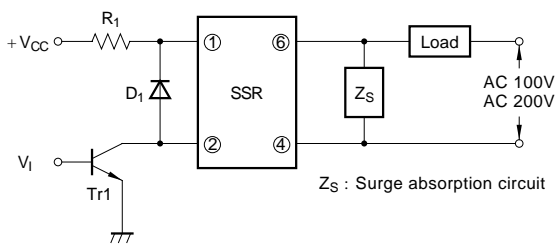
**Fig. 8 ON-state Current vs. ON-state Voltage**



**Fig. 9 Turn-on Time vs. Forward Current**



### 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 1 and 2 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 10mA.

● Please refer to the chapter “Precautions for Use”