

# S11MA01/S21MA01

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

### ■ Features

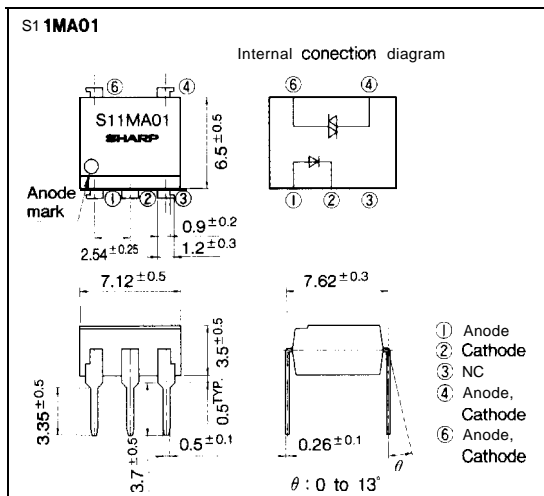
1. Low operating current type  
(MAX 60mA<sub>rms</sub>)
2. Compact 5-pin dual-in-line package type
3. Recognized by UL file No. E94758

### ■ 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 (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	$I_T$	100	mA <sub>rms</sub>	
	*1 peak one cycle surge current	$I_{\text{surge}}$	1.2	A	
	Repetitive peak OFF-state voltage	S11MA01 S21MA01	$V_{\text{DRM}}$	400 600	v
	*2 Isolation voltage	$V_{\text{iso}}$	5 000	$V_{\text{rms}}$	
Operating temperature		$T_{\text{opr}}$	-25 to +80	°C	
Storage temperature		$T_{\text{stg}}$	-55 to +125	°C	
*3 Soldering temperature		$T_{\text{sol}}$	260	°C	

\*1 50Hz sine wave

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

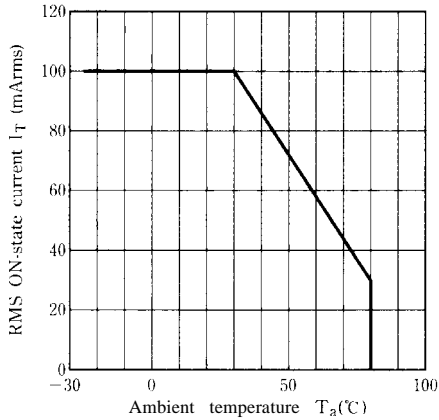
\*3 For 10 seconds

**Electro-optical Characteristics**

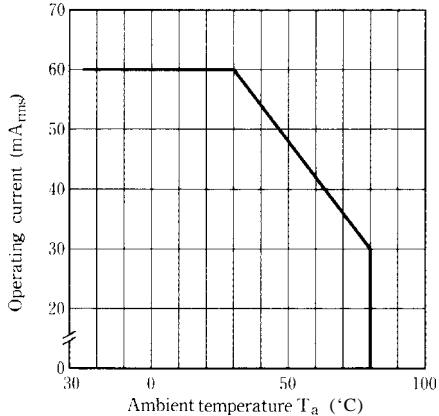
( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	-	1.2	1.4	V	
	Reverse current	$I_R$	$V_R = 3\text{V}$	-	-	$10^{-5}$	A	
output	Repetitive peak OFF-state voltage	$I_{DRM}$	$V_{DRM} = \text{Rated}$	-	-	$10^h$	A	
	ON-state voltage	$V_T$	$I_T = 0.06\text{A}$	-	-	2.5	v	
	Holding current	$I_H$	$V_D = 6\text{V}$	0.1	1.0	3.5	mA	
	Critical rate of rise of OFF-state voltage	$dV/dt$	$V_{DRM} = (1/\sqrt{2}) \cdot \text{Rated}$	500	-	-	$V/\mu\text{s}$	
	Operating current	S1 1MA01	-	AC100Vrms, 60Hz, Resistance load	-	-	-	-
		S21 MA01	-	AC200Vrms, Inductive load	-	-	60	'Arms
Transfer characteristics	Minimum trigger current	$I_{FT}$	$V_D = 6\text{V}, \therefore = 100\Omega^{\text{min}}$	-	-	10	mA	
	Isolation resistance	$R_{ISO}$	DC = 500V, 40 to 60%RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$	
	Turn-on time	$t_{on}$	$V_D = 6\text{V}, R_L = 100\Omega, I_F = 20\text{mA}$	-	-	100	$\mu\text{s}$	

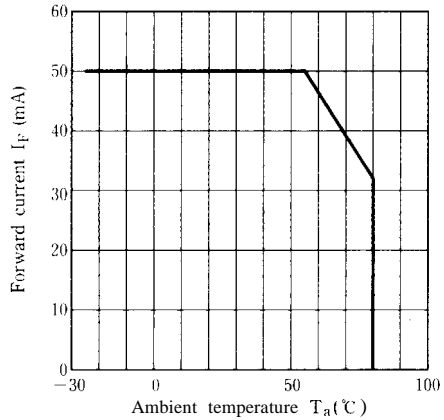
**Fig. 1 RMS ON-state Current vs. Ambient Temperature**



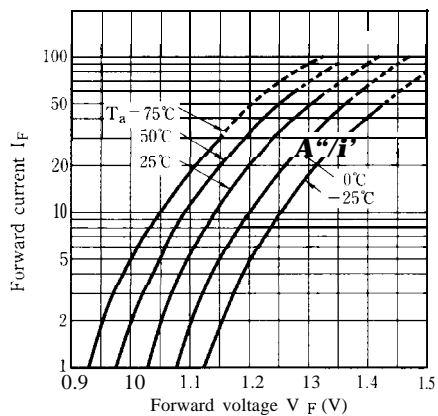
**Fig. 3 operating Current vs. Ambient Temperature**



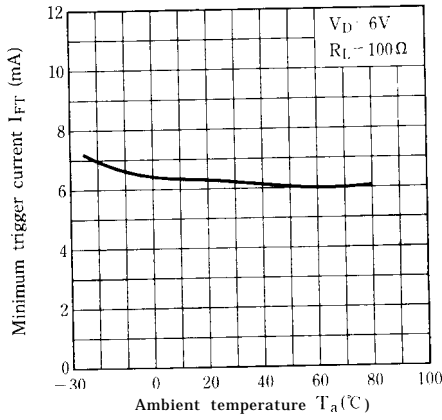
**Fig. 2 Forward Current vs. Ambient Temperature**



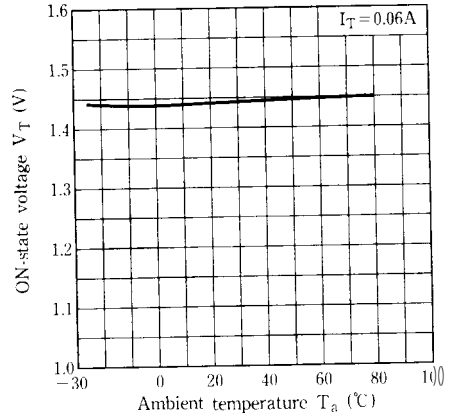
**Fig. 4 Forward Current vs. Forward Voltage**



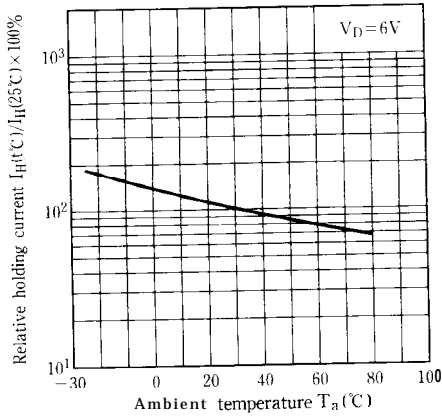
**Fig. 5 Minimum Trigger Current vs. Ambient Temperature**



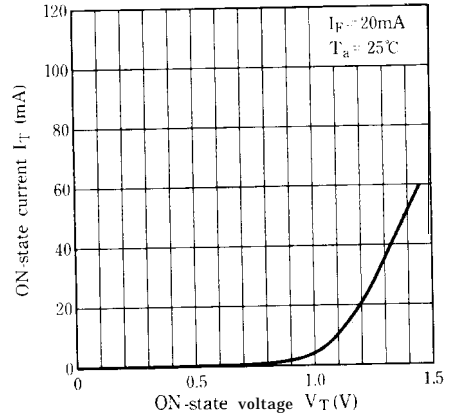
**Fig. 6 ON-state Voltage vs. Ambient Temperature**



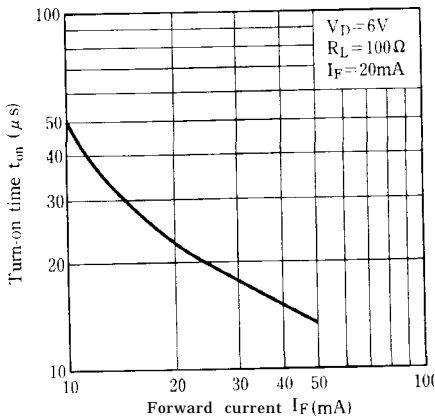
**Fig. 7 Relative Holding Current vs. Ambient Temperature**



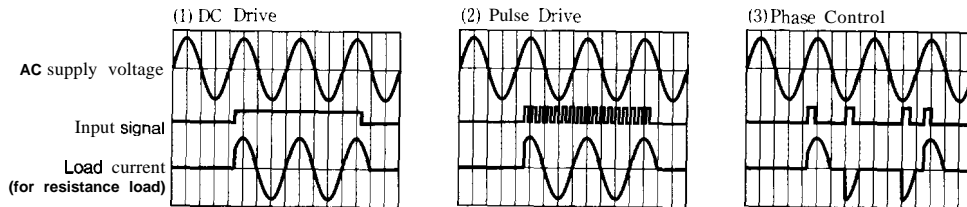
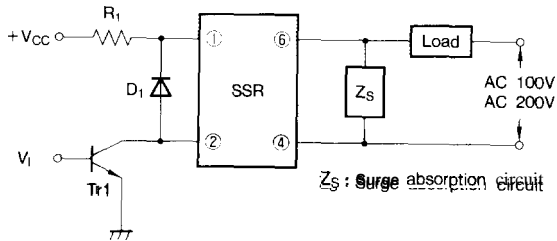
**Fig. 8 ON-state Current vs. ON-state Voltage**



**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 inure than 1 mA.

● Please refer to the chapter "Precautions for Use" (Page 78 to 93)