

# S11MS3/ S21MS3/S21MS4

## High Density Surface Mount Type Mini-flat Package Phototriac Coupler

### ■ Features

1. Ultra-compact, mini-flat package type  
(3.6 x 4.4 x 2.0mm)
2. Built-in zero-cross circuit  
(S21MS4)
3. High isolation voltage between input and output ( $V_{iso} : 3750V_{rms}$ )
4. Recognized by UL, file No.E64380

### ■ Model Line-ups

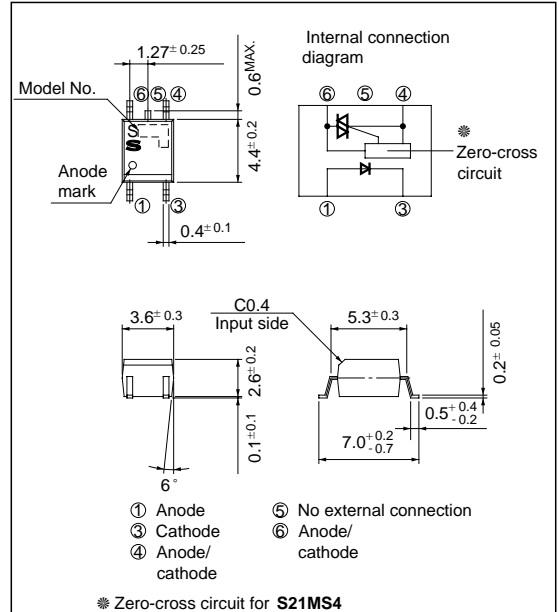
	For 100V lines	For 200V lines
No built-in zero-cross circuit	<b>S11MS3</b>	<b>S21MS3</b>
Built-in zero-cross circuit	-	<b>S21MS4</b>

### ■ Applications

1. For triggering of medium/high power triacs

### ■ Outline Dimensions

(Unit : mm)



### ■ Absolute Maximum Ratings

(Ta = 25°C)

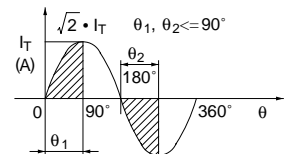
Parameter		Symbol	Rating		Unit
			S11MS3	S21MS3/S21MS4	
Input	Forward current	$I_F$	50		mA
	Reverse voltage	$V_R$	6		V
Output	*1 RMS ON-state current	$I_T$	0.05		$A_{rms}$
	*2 Peak one cycle surge current	$I_{surge}$	0.6		A
	Repetitive peak OFF-state voltage	$V_{DRM}$	400	600	V
*3 Isolation voltage		$V_{iso}$	3750		$V_{rms}$
Operating temperature		$T_{opr}$	-30 to +100		°C
Storage temperature		$T_{stg}$	-40 to +125		°C
*4 Soldering temperature		$T_{sol}$	260		°C

\*1 The definition of conduction angle  $\theta$  of effective ON current  $I_T$  should be as shown in the right drawing.

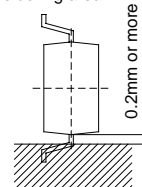
\*2 50Hz sine wave

\*3 40 to 60% RH, AC for 1 minute

\*4 For 10 seconds,



Soldering area

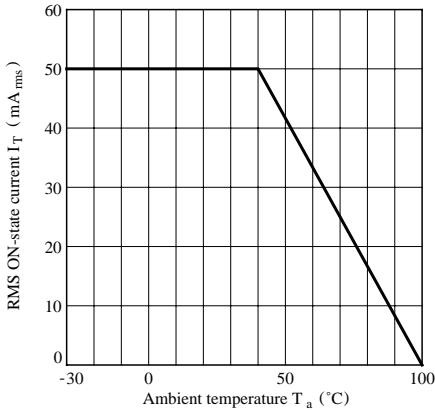


**■ Electro-optical Characteristics**

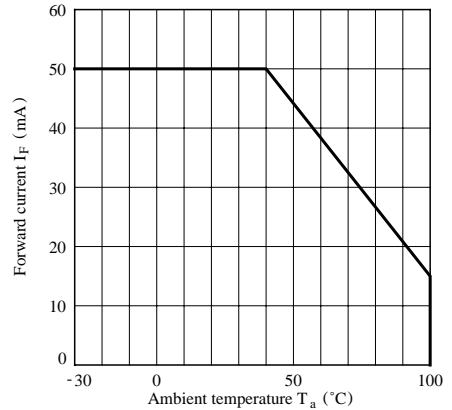
(T<sub>a</sub> = 25°C)

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	μA	
Output	Repetitive peak OFF-state current		I <sub>DRM</sub>	V <sub>DRM</sub> = Rated		1	μA	
	ON-state voltage		V <sub>T</sub>	I <sub>T</sub> = 0.05A		2.5	V	
	Holding current		I <sub>H</sub>	V <sub>D</sub> = 6V		0.1	3.5	mA
	Critical rate of rise of OFF-state voltage		dV/dt	V <sub>DRM</sub> = 1/√2 • Rated		100	1 000	V/μs
	Zero-cross voltage	<b>S21MS4</b>	V <sub>OX</sub>	I <sub>F</sub> = 15mA, Resistance load		-	35	V
	Minimum trigger current		I <sub>FT</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 100Ω		-	10	mA
Transfer characteristics	Isolation resistance		R <sub>ISO</sub>	DC500V, 40 to 60% RH		5 x 10 <sup>10</sup>	10 <sup>11</sup>	Ω
	Turn-on time	<b>S11MS3/S21MS3</b>	t <sub>on</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 100Ω ,		-	100	μs
		<b>S21MS4</b>		I <sub>F</sub> = 20mA		-	50	

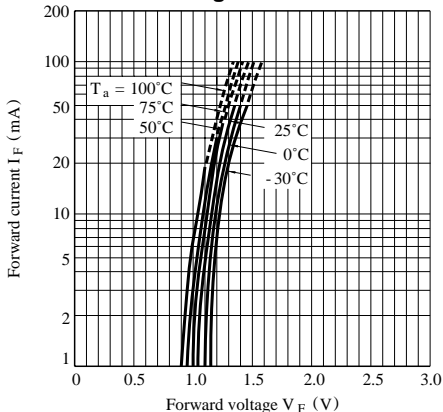
**Fig. 1 RMS ON-state Current vs. Ambient Temperature**



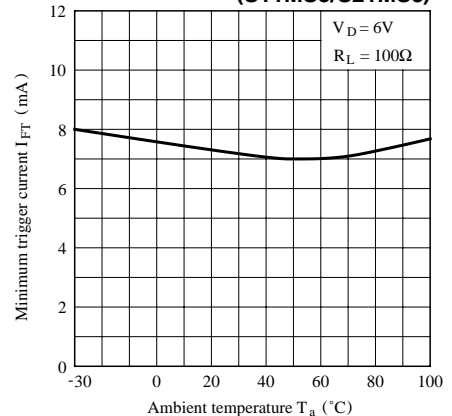
**Fig. 2 Forward Current vs. Ambient Temperature**



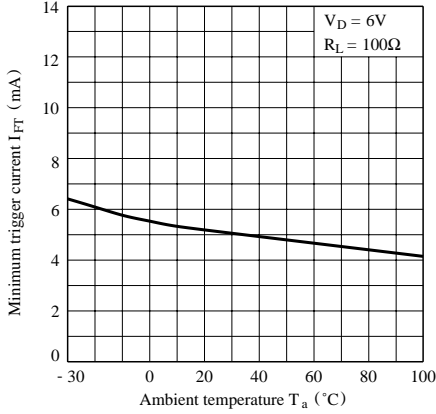
**Fig. 3 Forward Current vs. Forward Voltage**



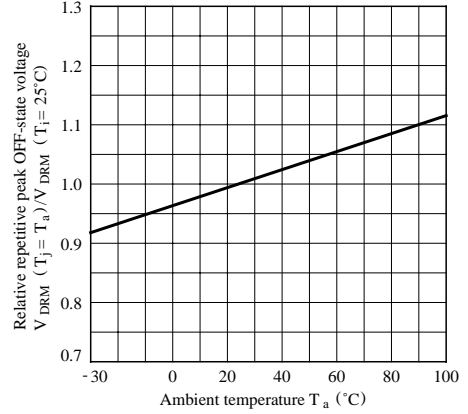
**Fig. 4-a Minimum Trigger Current vs. Ambient Temperature (S11MS3/S21MS3)**



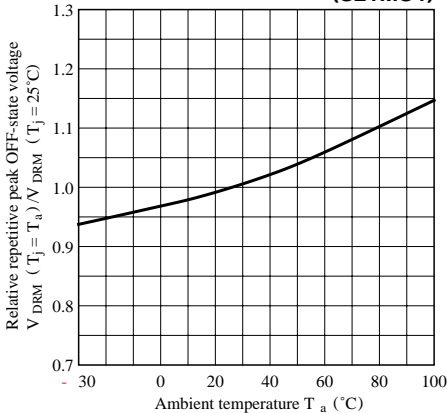
**Fig. 4-b Minimum Trigger Current vs. Ambient Temperature (S21MS4)**



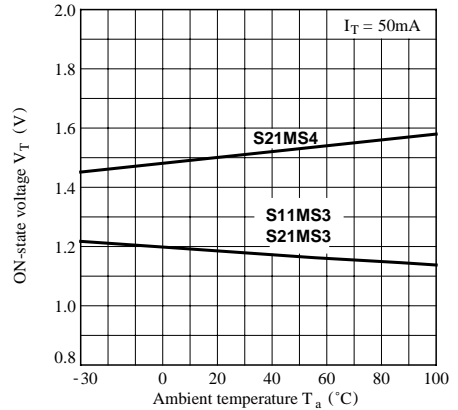
**Fig. 5-a Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature (S11MS3/S21MS3)**



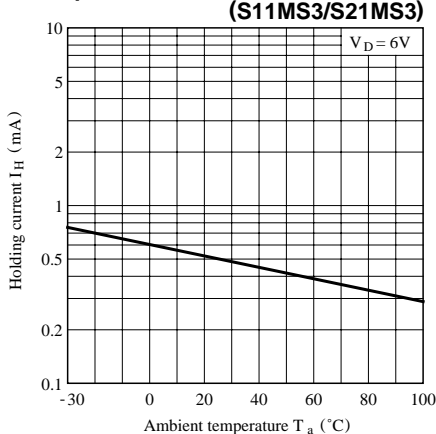
**Fig. 5-b Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature (S21MS4)**



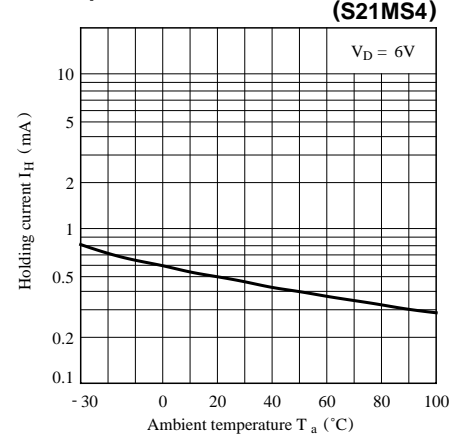
**Fig. 6 ON-state Voltage vs. Ambient Temperature**



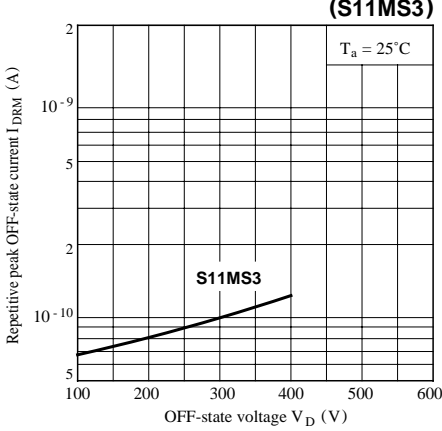
**Fig. 7-a Holding Current vs. Ambient Temperature (S11MS3/S21MS3)**



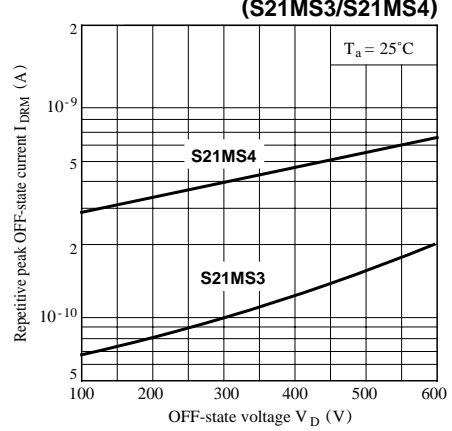
**Fig. 7-b Holding Current vs. Ambient Temperature (S21MS4)**



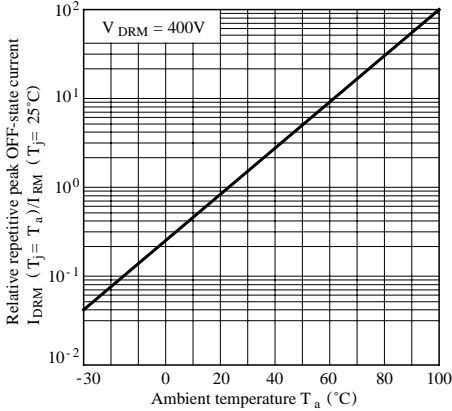
**Fig. 8-a Repetitive Peak OFF-state Current vs. OFF-state Voltage (S11MS3)**



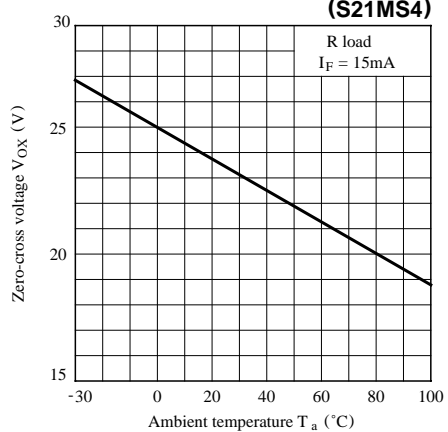
**Fig. 8-b Repetitive Peak OFF-state Current vs. OFF-state Voltage (S21MS3/S21MS4)**



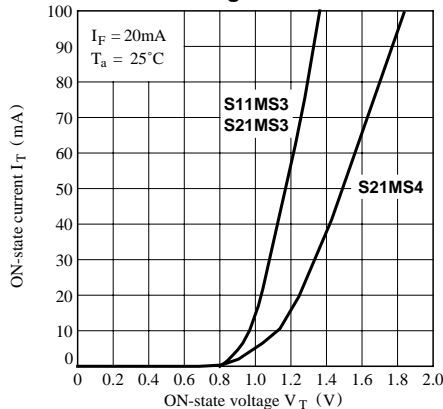
**Fig. 9 Relative Repetitive Peak OFF-state Current vs. Ambient Temperature**



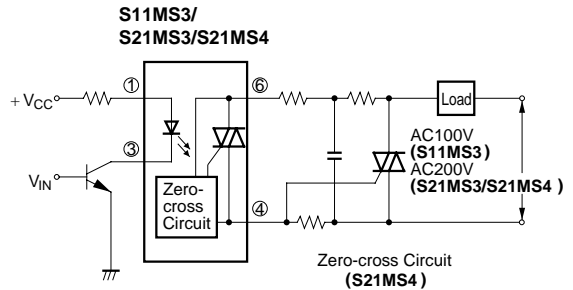
**Fig.10 Zero-cross Voltage vs. Ambient Temperature (S21MS4)**



**Fig.11 ON-state Current vs. ON-state Voltage**



**Basic Operation Circuit**



● Please refer to the chapter  
“Precautions for Use.” (Page 78 to 93).