

# S11MD5T/S21MD3TV/ S21MD4TV

## High Noise-resistance Type Phototriac Coupler

### ■ Features

1. NO.5 pin completely sealed in the mold for external noise resistance
2. Built-in zero-cross circuit (**S21MD4TV**)
3. High repetitive peak OFF-state voltage.  
 $\left( \begin{array}{l} \text{S11MD5T } V_{\text{DRM}} : \text{MIN. } 400\text{V} \\ \text{S21MD3TV/S21MD4TV } V_{\text{DRM}} : \text{MIN. } 600\text{V} \end{array} \right)$
4. Isolation voltage between input and output  
(Viso : 5 000 Vrms)
5. Recognized by UL : recognized, file No. E64380

### ■ Applications

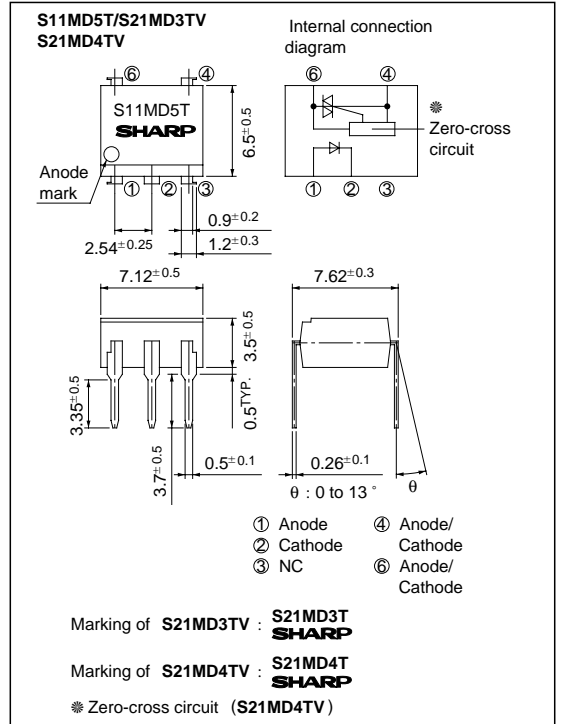
1. For triggering of power triac

### ■ Model Line-ups

100V	<b>S11MD5T</b>
200V	<b>S21MD3TV/S21MD4TV</b>

### ■ Outline Dimensions

(Unit : mm)



### ■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter	Symbol	Rating		Unit	
		S11MD5T	S21MD3TV/S21MD4TV		
Input	Forward current	IF		50	mA
	Reverse voltage	VR		6	V
Output	RMS ON-state current	IT		0.1	A <sub>rms</sub>
	*1 Peak one cycle surge current	I <sub>surge</sub>		1.2	A
	Repetitive peak OFF-state voltage	V <sub>DRM</sub>	400	600	V
*2 Isolation voltage		V <sub>iso</sub>	5 000		V <sub>rms</sub>
Operating temperature		T <sub>opr</sub>	- 30 to +100		°C
Storage temperature		T <sub>stg</sub>	- 55 to +125		°C
*3 Soldering temperature		T <sub>sol</sub>	260		°C

\*1 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	<b>S11MD5T/S21MD4TV</b> <b>S21MD3TV</b>	$I_F = 20\text{mA}$	-	1.2	1.4	V	
			$I_F = 30\text{mA}$					
	Reverse current	$I_R$	$V_R = 3\text{V}$	-	-	$10^{-5}$	A	
Output	Repetitive peak OFF-state current	$I_{DRM}$	$V_{DRM} = R_{\text{rated}}$	-	-	$10^{-6}$	A	
	ON-state voltage	<b>S11MD5T</b> <b>S21MD3TV/S21MD4TV</b>	$I_T = 0.1\text{A}$	-	1.3	2.0	V	
				-	1.7	2.5	V	
	Holding current	$I_H$	$V_D = 6\text{V}$	0.1	1	3.5	mA	
	Critical rate of rise of OFF-state voltage	<b>S11MD5T/S21MD4TV</b> <b>S21MD3TV</b>	$dV/dt$	$V_{DRM} = 1/\sqrt{2}$ Rated	100	-	-	V/ $\mu\text{s}$
500					-	-	V/ $\mu\text{s}$	
Zero-cross voltage	<b>S21MD4TV</b>	$V_{OX}$	Resistance load $I_F = 15\text{mA}$	-	-	35	V	
Transfer characteristics	Minimum trigger current	$I_{FT}$	$V_D = 6\text{V}$ $R_L = 100\Omega$	-	-	10	mA	
	Isolation resistance	$R_{ISO}$	DC500V 40 to 60% RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$	
	Turn-on time	<b>S11MD5T</b> <b>S21MD3TV</b> <b>S21MD4TV</b>	$t_{on}$	$V_D = 6\text{V}, I_F = 20\text{mA}^{*4}$ $R_L = 100\Omega$	-	80	200	$\mu\text{s}$
					-	-	100	$\mu\text{s}$
-					20	50	$\mu\text{s}$	

\*4 **S21MD3TV** :  $I_F=30\text{mA}$ 

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

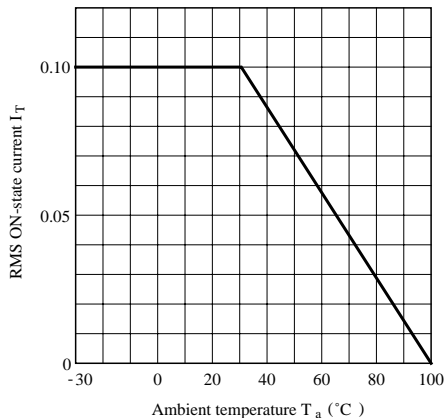
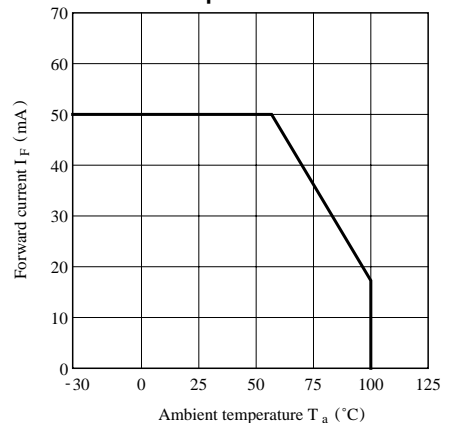
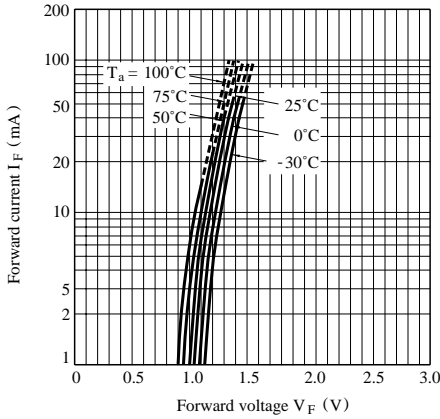


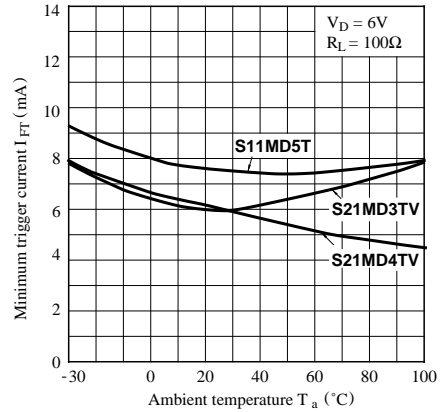
Fig. 2 Forward Current vs. Ambient Temperature



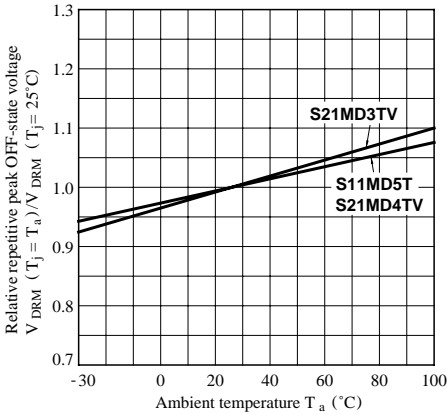
**Fig. 3 Forward Current vs. Forward Voltage**



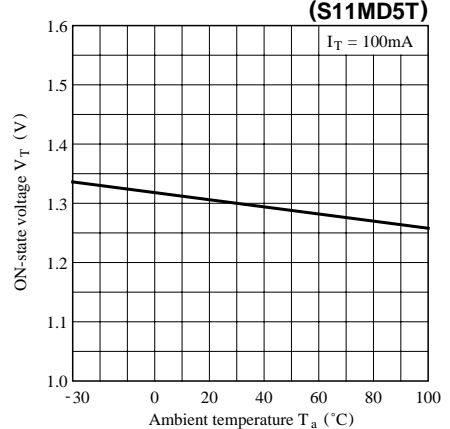
**Fig. 4 Minimum Trigger Current vs. Ambient Temperature**



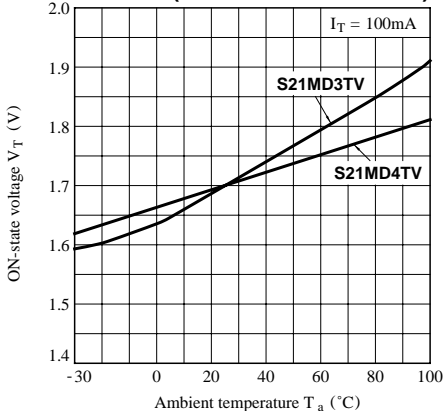
**Fig. 5 Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature**



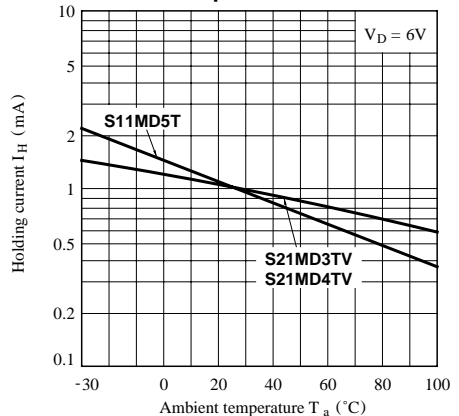
**Fig. 6-a ON-state Voltage vs. Ambient Temperature (S11MD5T)**



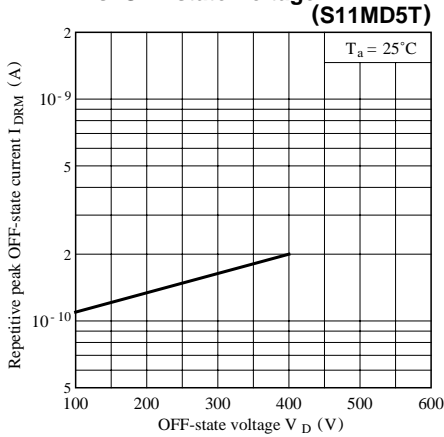
**Fig. 6-b ON-state Voltage vs. Ambient Temperature (S21MD3TV/S21MD4TV)**



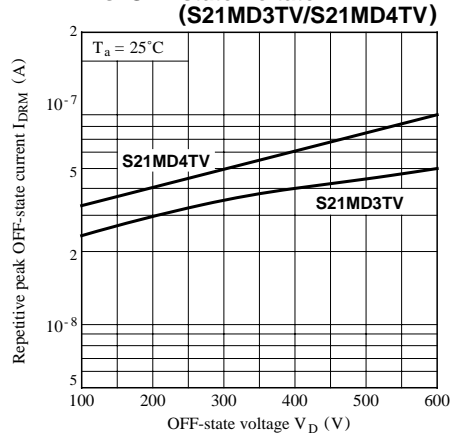
**Fig. 7 Holding Current vs. Ambient Temperature**



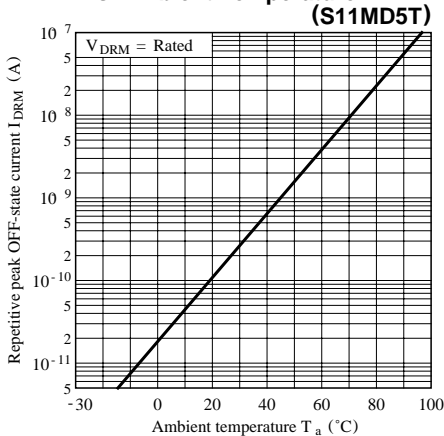
**Fig. 8-a Repetitive Peak OFF-state Current vs. OFF-state Voltage**



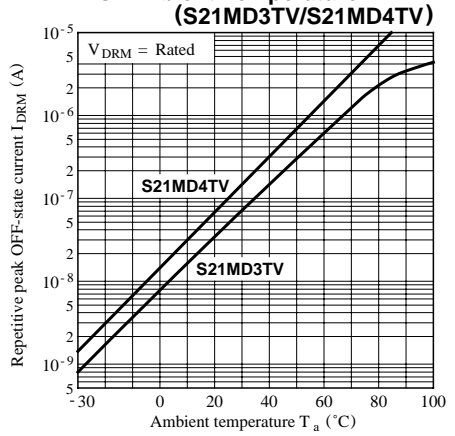
**Fig. 8-b Repetitive Peak OFF-state Current vs. OFF-state Voltage**



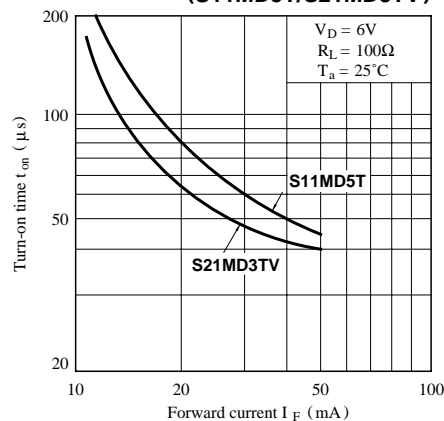
**Fig. 9-a Repetitive Peak OFF-state Current vs. Ambient Temperature**



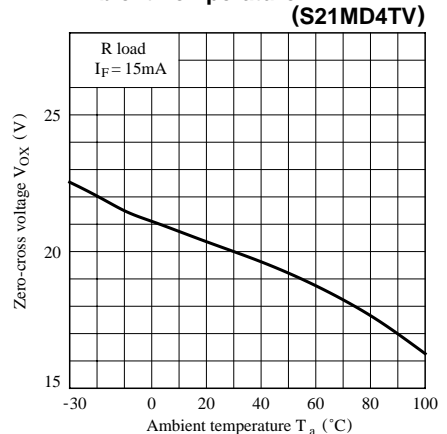
**Fig. 9-b Repetitive Peak OFF-state Current vs. Ambient Temperature**



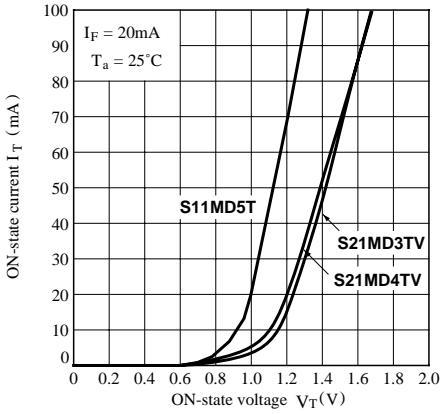
**Fig.10 Turn-on Time vs. Forward Current**



**Fig.11 Zero-cross Voltage vs. Ambient Temperature**

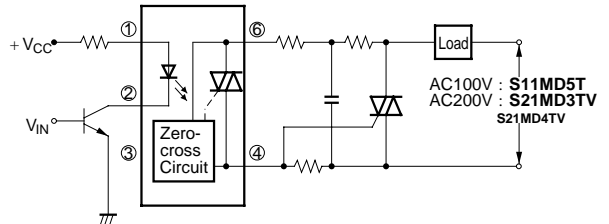


**Fig.12 ON-state Current vs. ON-state Voltage**



**Basic Operation Circuit**

**Medium/High Power Triac Drive Circuit**



Note) Please use on condition of the triac for power triggers.  
Zero-cross circuit is applied to **S21MD4TV**.

- Please refer to the chapter “Precautions for Use.”