

# S11MD7T/S11MD8T/S11MD9T S21MD7T/S21MD8T/S21MD9T

## Low Input Driving Type Phototriac Coupler

- \* Taping reel type of **S21MD8T** is also available (**S21MD8P**)
- \* DIN-VDE0884 approved type is also available.

### ■ Features

- Low input driving current  
(**S11MD7T / S11MD8T / S21MD7T / S21MD8T**)  
 $I_{FT}$  : MAX. 5mA  
**S11MD9T / S21MD9T**  $I_{FT}$  : MAX.7mA )
- Pin No. 5 completely molded for external noise resistance
- Built-in zero-cross circuit (**S11MD8T/S21MD8T**)
- High repetitive peak OFF-state voltage  
(**S11MD7T / S11MD8T / S11MD9T**)  
 $V_{DRM}$  : MIN. 400V  
**S21MD7T / S21MD8T / S21MD9T**  
 $V_{DRM}$  : MIN. 600V
- Isolation voltage between input and output  
( $V_{iso}$  : 5 000V<sub>rms</sub>)
- Recognized by UL, file No.E64380

### ■ Model Line-ups

	100V line	200V line
No zero-cross circuit	<b>S11MD7T/ S11MD9T</b>	<b>S21MD7T/ S21MD9T</b>
Built-in zero-cross circuit	<b>S11MD8T</b>	<b>S21MD8T</b>

### ■ Applications

- For triggering medium/high power triacs

### ■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter	Symbol	Rating		Unit
		S11MD7T/S11MD8T S11MD9T	S21MD7T/S21MD8T/ S21MD9T	
Input	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	6	V
Output	RMS ON-state current	$I_T$	0.1	A <sub>rms</sub>
	*1 Peak one cycle surge current	$I_{surge}$	1.2	A
	Repetitive peak OFF-state voltage	$V_{DRM}$	400	600
*2 Isolation voltage	$V_{iso}$		5 000	V <sub>rms</sub>
Operating temperature	$T_{opr}$		- 30 to +100	°C
Storage temperature	$T_{stg}$		- 55 to +125	°C
*3 Soldering temperature	$T_{sol}$		260	°C

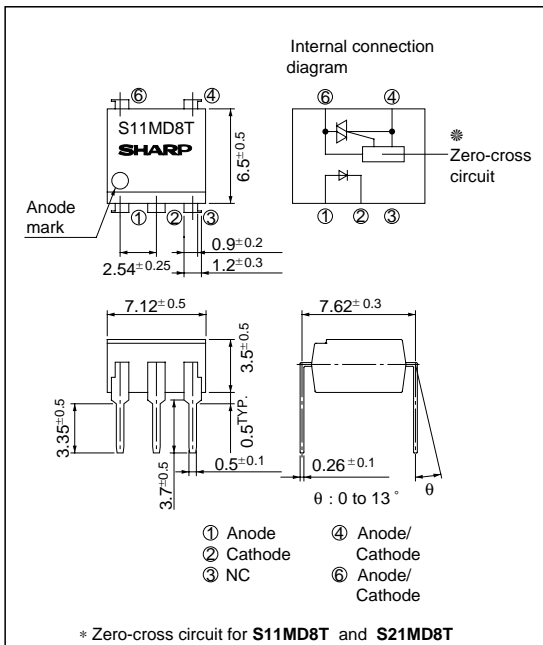
\*1 50Hz Sine wave

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

\*3 For 10 seconds

### ■ Outline Dimensions

(Unit : mm)



## Electro-optical Characteristics

(Ta = 25°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		
Repetitive peak OFF-state current		$I_{DRM}$	$V_{DRM} = \text{Rated}$	-	-	$10^{-6}$	A		
Output	ON-state voltage	S11MD7T/S21MD7T S11MD9T/S21MD9T	$I_T = 0.1\text{A}$	-	1.5	2.5	V		
		S11MD8T/S21MD8T		-	1.7	2.5			
		Holding current		$I_H$	$V_D = 6\text{V}$	0.1		0.5	3.5
	Critical rate of rise of OFF-state voltage		$dV/dt$	$V_{DRM} = 1/\sqrt{2} \cdot \text{Rated}$	100	-	-	V/ $\mu\text{s}$	
	Zero-cross voltage		S11MD8T/S21MD8T	$V_{OX}$	Resistance load, $I_F = 10\text{mA}$		-	-	35
Transfer characteristics	Minimum trigger current	S11MD7T/S21MD7T S11MD8T/S21MD8T	$I_{FT}$	$V_D = 6\text{V}, R_L = 100\Omega$	-	-	5	mA	
		S11MD9T/S21MD9T			-	-	7		
		Isolation resistance			$R_{ISO}$	DC500V, 40 to 60% RH			$5 \times 10^{10}$
	Turn-on time	S11MD7T	$t_{on}$	$V_D = 6\text{V}, R_L = 100\Omega$ $I_F = 20\text{mA}$	-	70	100	$\mu\text{s}$	
S11MD9T/S21MD7T/ S21MD9T		-			60	100			
S11MD8T/S21MD8T		-			20	50			

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

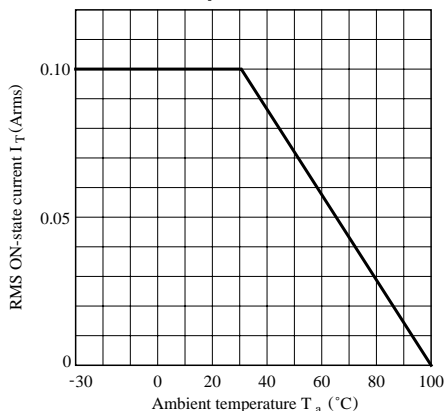
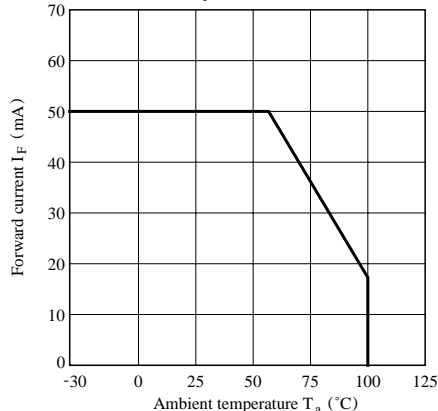
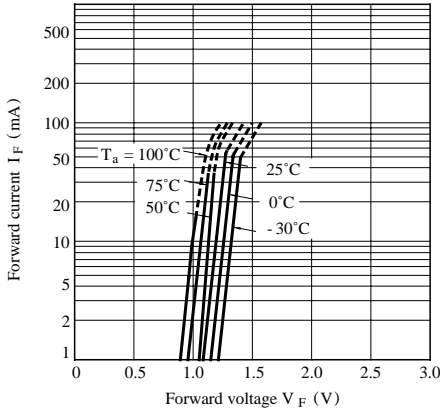


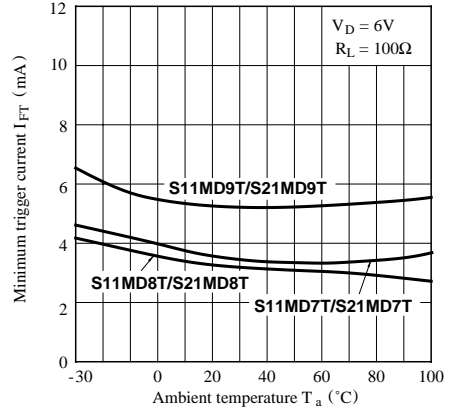
Fig. 2 Forward Current vs. Ambient Temperature



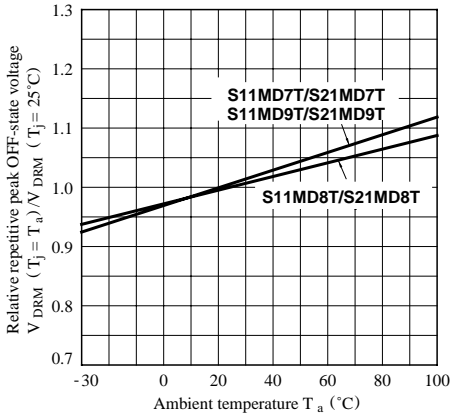
**Fig. 3 Forward Current vs. Forward Voltage**



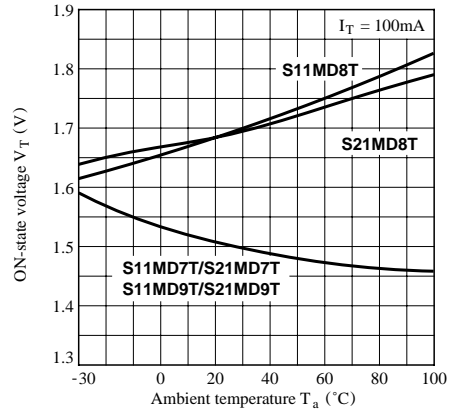
**Fig. 4 Minimum Trigger Current vs. Ambient Temperature**



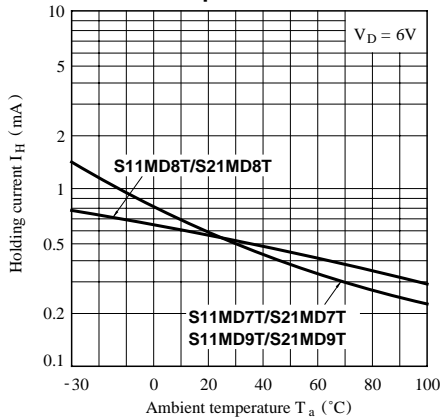
**Fig. 5 Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature**



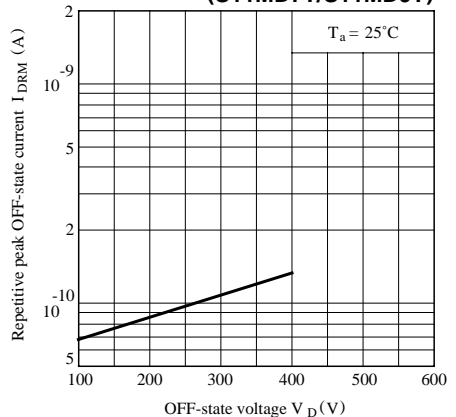
**Fig. 6 ON-state Voltage vs. Ambient Temperature**



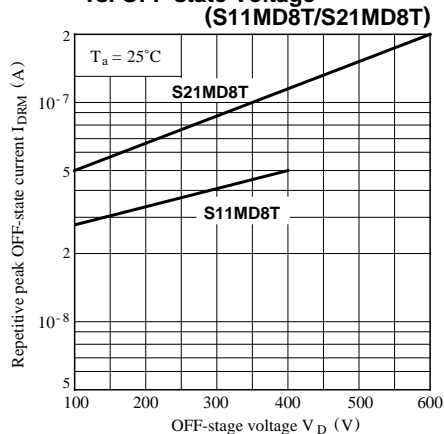
**Fig. 7 Holding Current vs. Ambient Temperature**



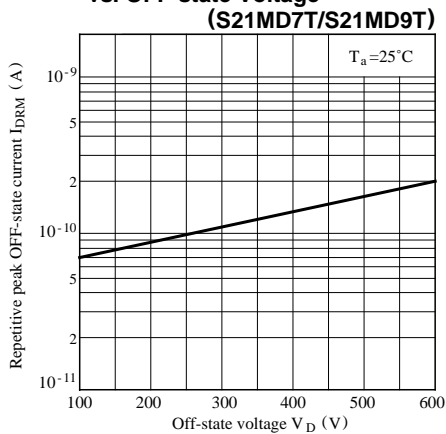
**Fig. 8-a Repetitive Peak OFF-state Current vs. OFF-state Voltage (S11MD7T/S11MD9T)**



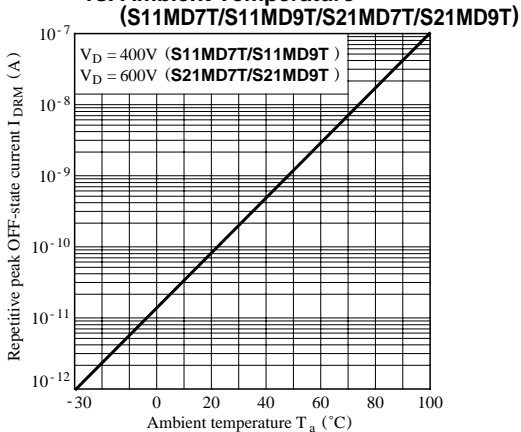
**Fig. 8-b Repetitive Peak OFF-state Current vs. OFF-state Voltage**



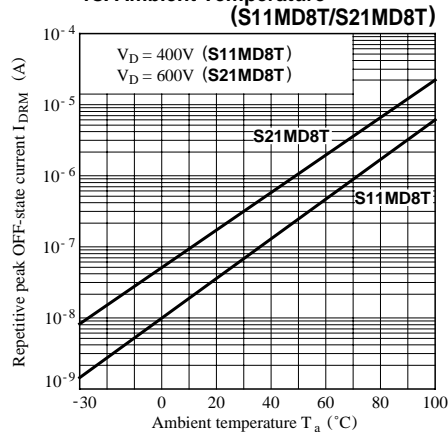
**Fig. 8-c Repetitive Peak OFF-state Current vs. OFF-state Voltage**



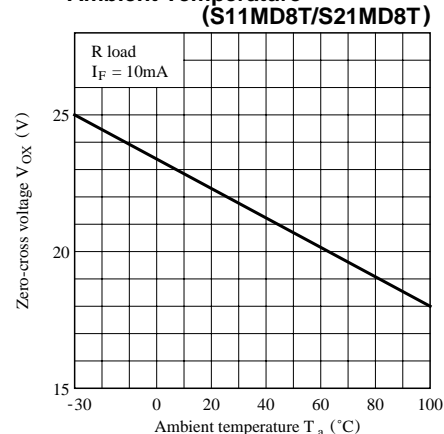
**Fig. 9-a Repetitive Peak OFF-state Current vs. Ambient Temperature**



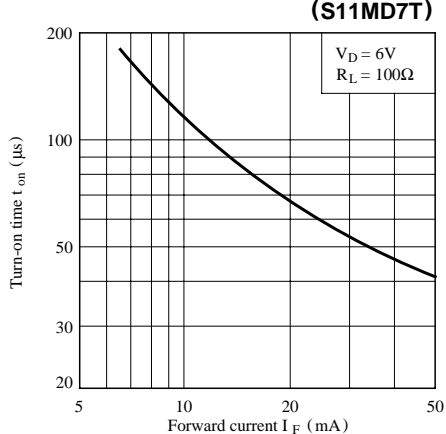
**Fig. 9-b Repetitive Peak OFF-state Current vs. Ambient Temperature**



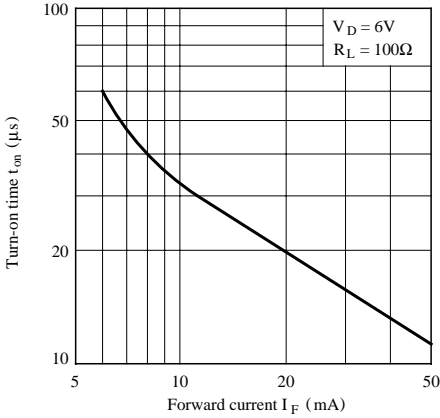
**Fig.10 Zero-cross Voltage vs. Ambient Temperature**



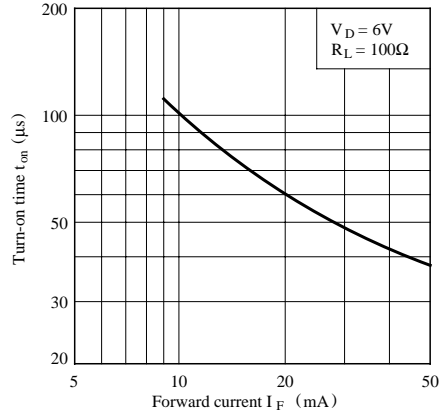
**Fig.11-a Turn-on Time vs. Forward Current**



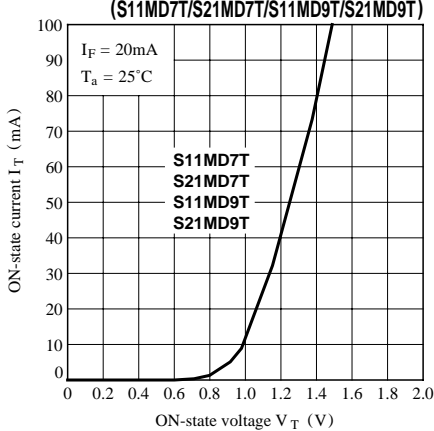
**Fig.11-b Turn-on Time vs. Forward Current (S11MD8T/S21MD8T)**



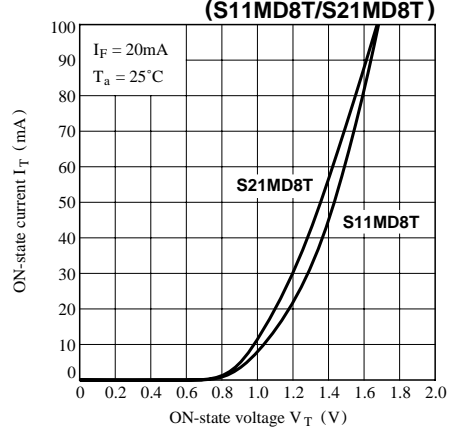
**Fig.11-c Turn-on Time vs. Forward Current (S11MD9T/S21MD7T/S21MD9T)**



**Fig.12-a ON-state Current vs. ON-state Voltage (S11MD7T/S21MD7T/S11MD9T/S21MD9T)**

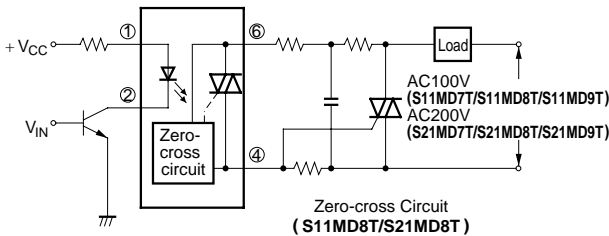


**Fig.12-b ON-state Current vs. ON-state Voltage (S11MD8T/S21MD8T)**



**Basic Operation Circuit**

**S11MD7T/S11MD8T/S11MD9T  
S21MD7T/S21MD8T/S21MD9T**



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