S11MD7T/S11MD8T/S11MD9T S21MD7T/S21MD8T/S21MD9T

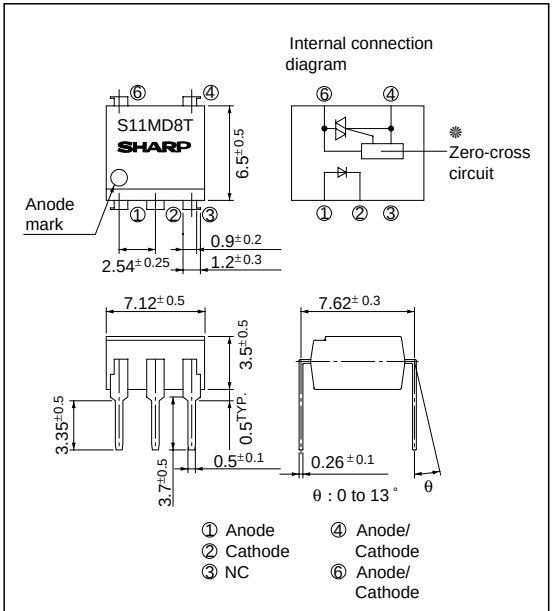
Low Input Driving Type Phototriac Coupler

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

■ Features

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

■ Outline Dimensions (Unit : mm)



∗ Zero-cross circuit for **S11MD8T** and **S21MD8T**

■ Model Line-ups

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

■ Applications

1. 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_{rms}
	*1Peak one cycle surge current	I_{surge}	1.2		A
	Repetitive peak OFF-state voltage	V_{DRM}	400	600	V
*2Isolation voltage		V_{iso}	5 000		V_{rms}
Operating temperature		T_{opr}	- 30 to +100		˚C
Storage temperture		T_{stg}	- 55 to +125		˚C
*3Soldering temperature		T_{sol}	260		˚C

∗1 50Hz 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		V_F	I_F = 20mA	-	1.2	1.4	V
	Reverse current		I_R	V_R = 3V	-	-	10^{-5}	A
Output	Repetitive peak OFF-state current		I_{DRM}	V_{DRM} = Rated	-	-	10^{-6}	A
	ON-state voltage	S11MD7T/S21MD7T S11MD9T/S21MD9T	V_T	I_T = 0.1A	-	1.5	2.5	V
		S11MD8T/S21MD8T			-	1.7	2.5	
	Holding current		I_H	V_D = 6V	0.1	0.5	3.5	mA
	Critical rate of rise of OFF-state voltage		dV/dt	V_{DRM} = $1/\sqrt{2}$ • Rated	100	-	-	V/μs
	Zere-cross voltage	S11MD8T/S21MD8T	V_{OX}	Resistance load, I_F = 10mA	-	-	35	V
Transfer characteristics	Minimum trigger current	S11MD7T/S21MD7T S11MD8T/S21MD8T	I_{FT}	V_D = 6V, R_L = 100Ω	-	-	5	mA
		S11MD9T/S21MD9T			-	-	7	
	Isolation resistance		R_{ISO}	DC500V, 40 to 60% RH	5 x 10^{10}	10^{11}	-	Ω
	Turn-on time	S11MD7T	t_{on}	V_D = 6V, R_L = 100Ω I_F = 20mA	-	70	100	μs
		S11MD9T/S21MD7T/ S21MD9T			-	60	100	
		S11MD8T/S21MD8T			-	20	50	

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

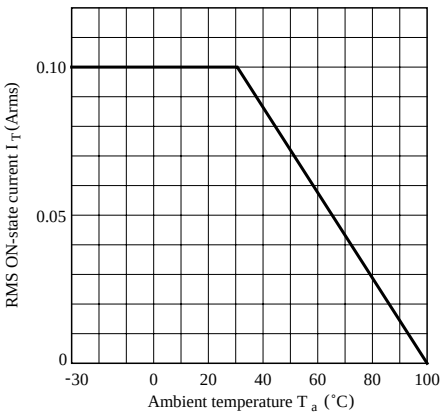


Fig. 2 Forward Current vs. Ambient Temperature

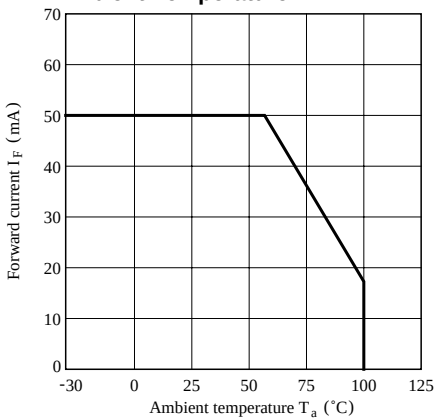


Fig. 3 Forward Current vs. Forward Voltage

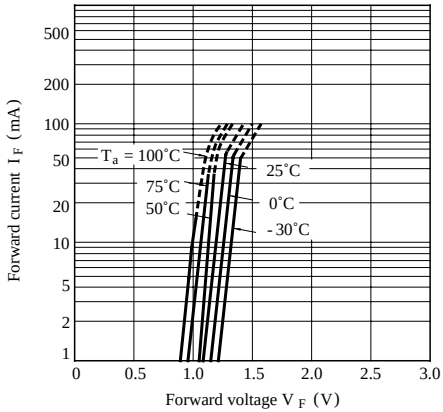


Fig. 4 Minimum Trigger Current vs. Ambient Temperature

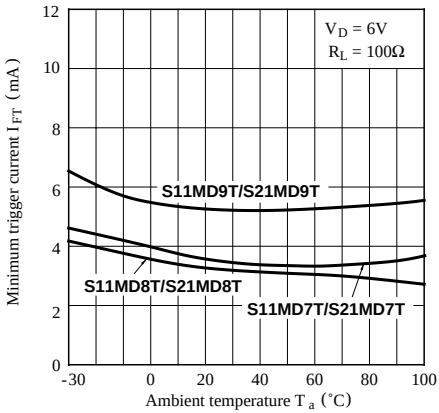


Fig. 5 Relative Repetitive Peak OFF-State Voltage vs. Ambient Temperature

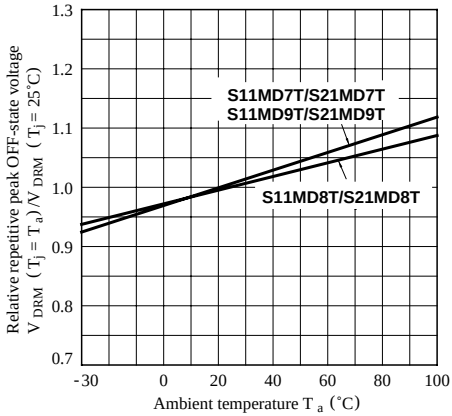


Fig. 6 ON-state Voltage vs. Ambient Temperature

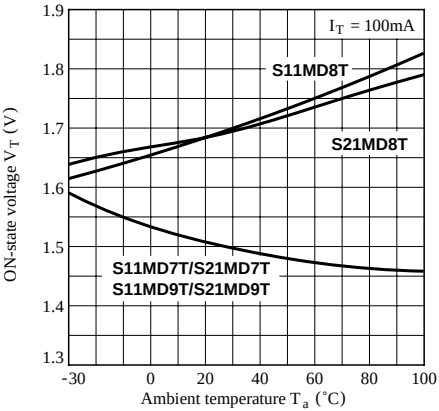


Fig. 7 Holding Current vs. Ambient Temperature

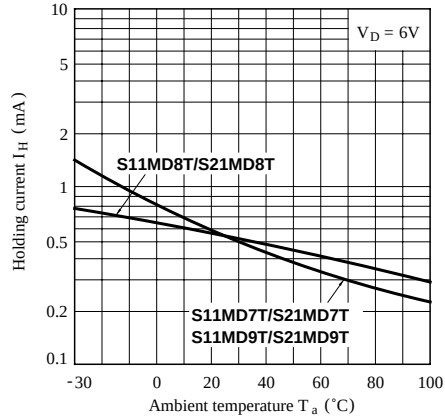


Fig. 8-a Repetitive Peak OFF-state Current vs. OFF-state Voltage (S11MD7T/S11MD9T)

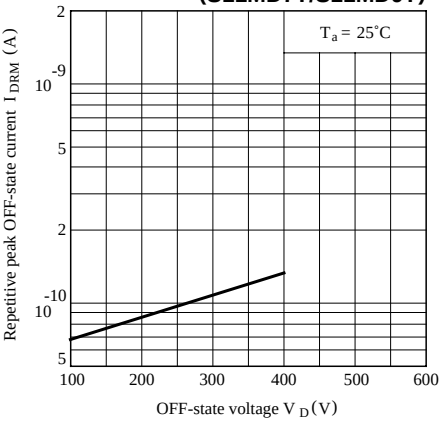


Fig. 8-b Repetitive Peak OFF-state Current vs. OFF-state Voltage (S11MD8T/S21MD8T)

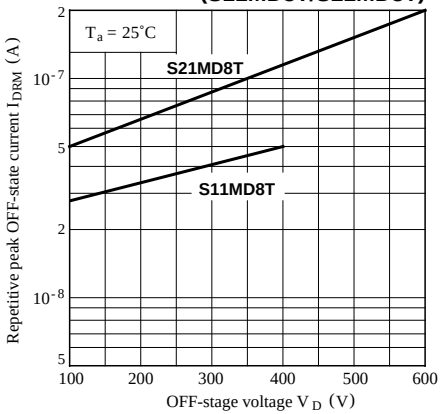


Fig. 8-c Repetitive Peak OFF-state Current vs. OFF-state Voltage (S21MD7T/S21MD9T)

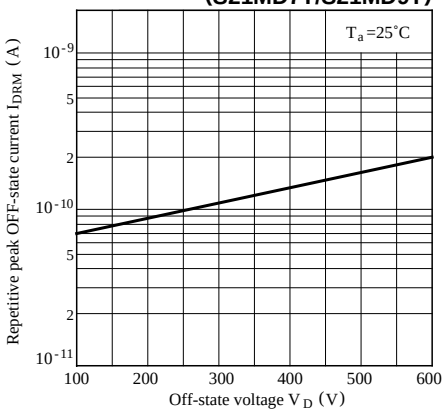


Fig. 9-a Repetitive Peak OFF-state Current vs. Ambient Temperature (S11MD7T/S11MD9T/S21MD7T/S21MD9T)

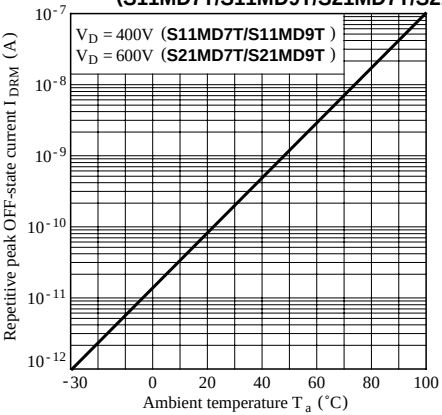


Fig. 9-b Repetitive Peak OFF-state Current vs. Ambient Temperature (S11MD8T/S21MD8T)

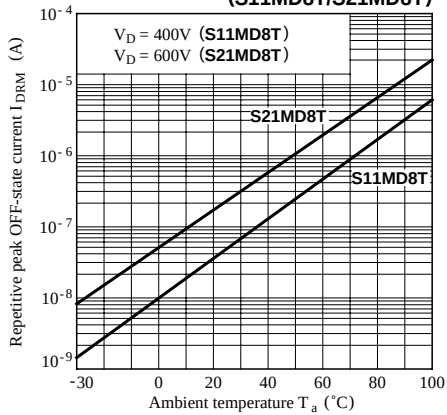


Fig.10 Zero-cross Voltage vs. Ambient Temperature (S11MD8T/S21MD8T)

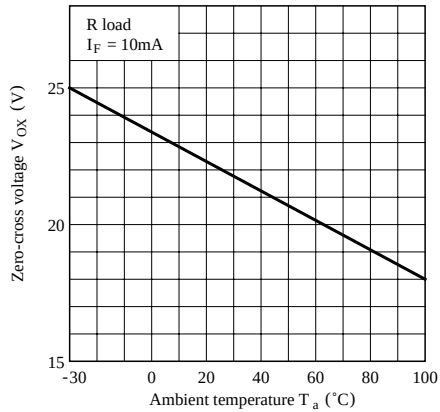


Fig.11-a Turn-on Time vs. Forward Current (S11MD7T)

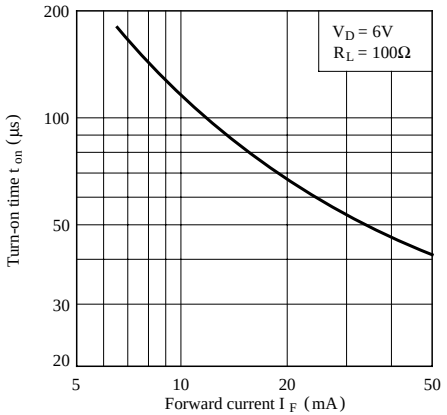


Fig.11-b Turn-on Time vs. Forward Current (S11MD8T/S21MD8T)

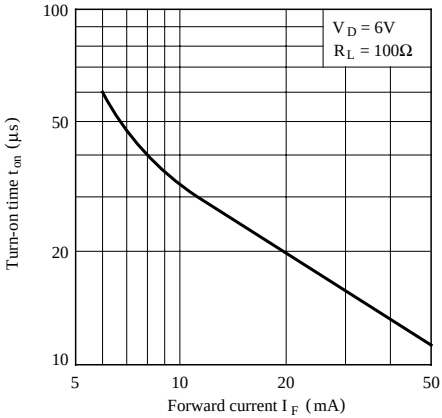


Fig.11-c Turn-on Time vs. Forward Current (S11MD9T/S21MD7T/S21MD9T)

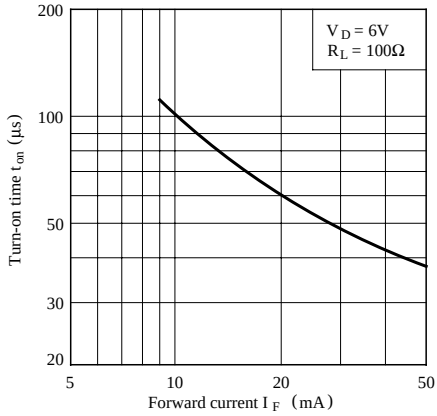


Fig.12-a ON-state Current vs. ON-state Voltage (S11MD7T/S21MD7T/S11MD9T/S21MD9T)

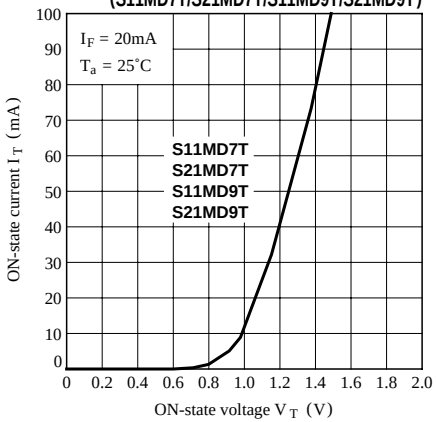
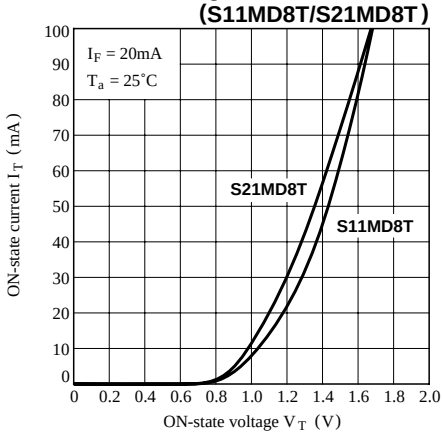
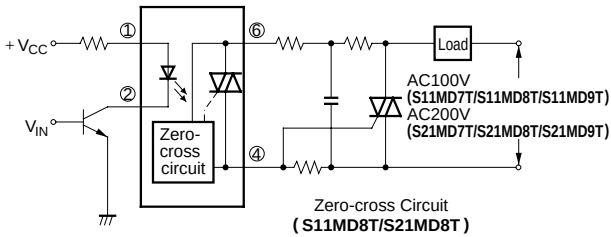


Fig.12-b ON-state Current vs. ON-state Voltage (S11MD8T/S21MD8T)



■ Basic Operation Circuit

S11MD7T/S11MD8T/S11MD9T
S21MD7T/S21MD8T/S21MD9T



Zero-cross Circuit
(S11MD8T/S21MD8T)

- Please refer to the chapter " Precautions for Use."

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