S1 1MD7T/S11MD8T/S1 1 MD9T Low Input Driving Type
S21 MD7T/S21MD8T/S21 MD9T Phototriac Coupler

※Taping reel type of s21 MD8T is also available (S21 MD8P)(Page 656)
※DIN-VDE0884 approved type is also available.

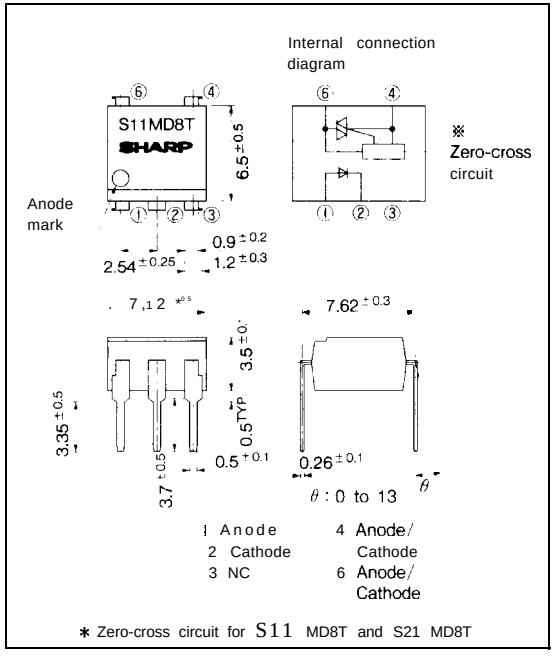
■ Features

1. Low input driving current
   (S1 1MD7T/S11 MD8T/S21MD7T/S21 MD8T
   I_{FT} : MAX. 5mA
   S11 MD9T/S21 MD9T I_{FT} : MAX.7mA)
2. Pin No. 5 completely molded for external noise resistance
3. Built-in zero-cross circuit (S1 1MD8T/S21MD8T)
4. High repetitive peak OFF-state voltage
   (s1 1MD7T/S11MD8T/S11MD9T
   V_{DRM} : MIN. 400V
   S21 MD7T/S21MD8T/S21 MD9T
   V_{DRM} : MIN. 600V
5. Isolation voltage between input and output (V,.(, :5 000V_{rms})
6. Recognized by UL, file No. E64380

■ Model Line-ups

	100V line	200V line
No zero-cross circuit	S11 MD7T/ S11MD9T	S21MD7T/ S21 MD9T
Built-in zero-cross circuit	S11 MD8T	S21 MD8T

■ Outline Dimensions (Unit : mm)



※ Zero-cross circuit for S11 MD8T and S21 MD8T

■ Applications

1. For triggering medium/high power triacs

■ Absolute Maximum Ratings (Ta=25℃)

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

*150Hz Sine wave
*2 40 to 60 %RH, AC for 1 minute, f 60Hz
*3 For 10 seconds

■ Electro-optical Characteristics

(Ta = 25℃)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	IF= 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	VO=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 charac teristics	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	5×10^{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

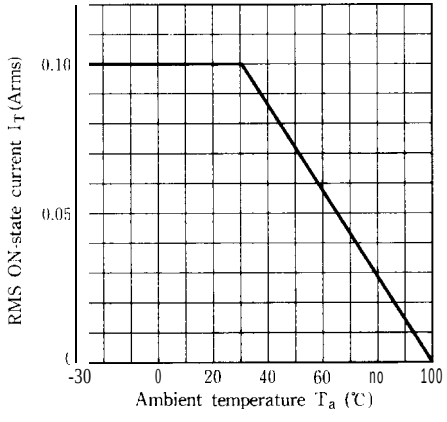


Fig. 2 Forward Current vs. Ambient Temperature

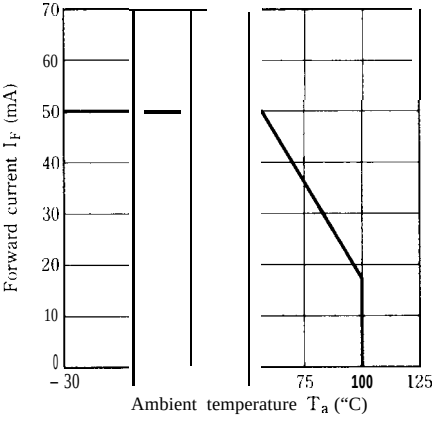


Fig. 3 Forward Current vs. Forward Voltage

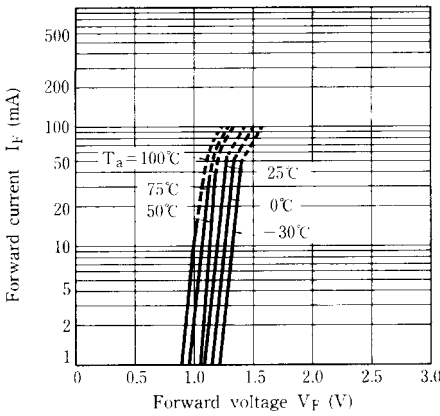


Fig. 4 Minimum Trigger Current vs. Ambient Temperature

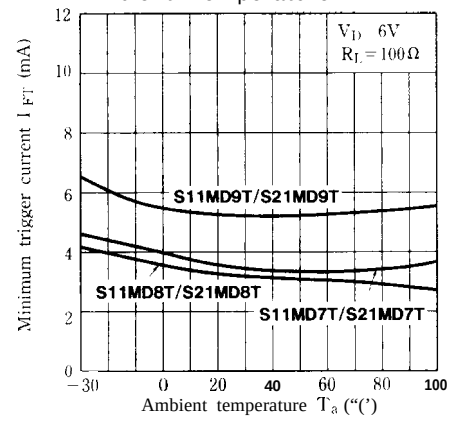


Fig. 5 **Relative Repetitive Peak OFF-State Voltage vs. Ambient Temperature**

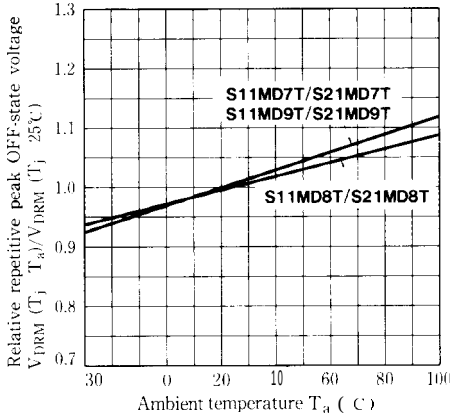


Fig. 6 ON-state Voltage vs. Ambient Temperature

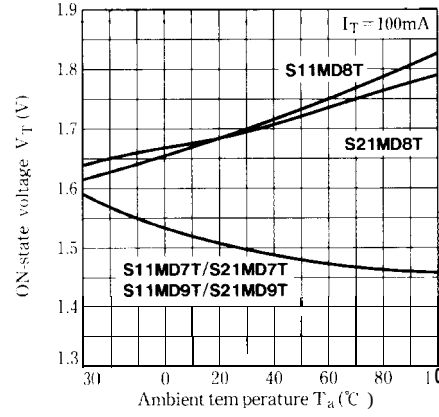


Fig. 7 Holding Current vs. Ambient Temperature

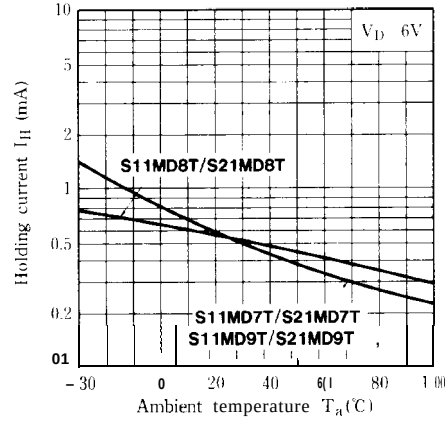


Fig. 8-a Repetitive Peak OFF-state Current vs. OFF-state Voltage (S11MD7T/S11MD9T)

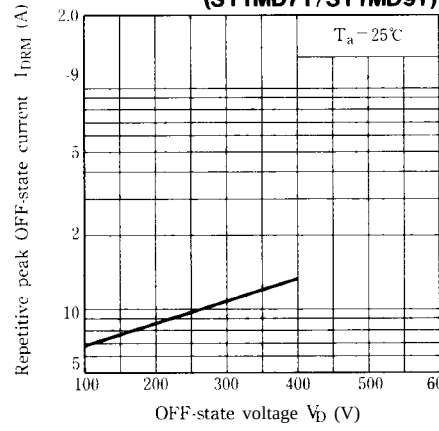


Fig. 8-b Repetitive Peak OFF-state Current vs. OFF-state Voltage (S11MD8T/S21MD8T)

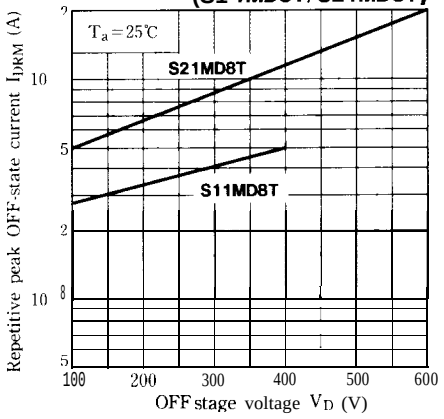


Fig. 8-c Repetitive Peak OFF-state Current vs. OFF-state Voltage (S21MD7T/S21MD9T)

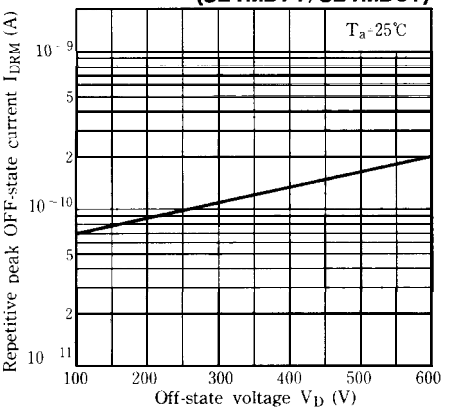


Fig. 9-a Repetitive Peak OFF-state Current vs. Ambient Temperature (S11MD7T/S11MD9T/S21MD7T/S21MD9T)

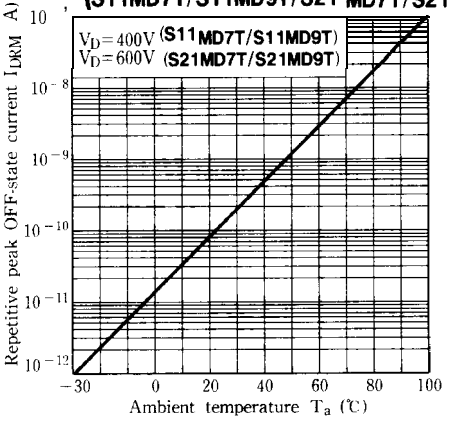
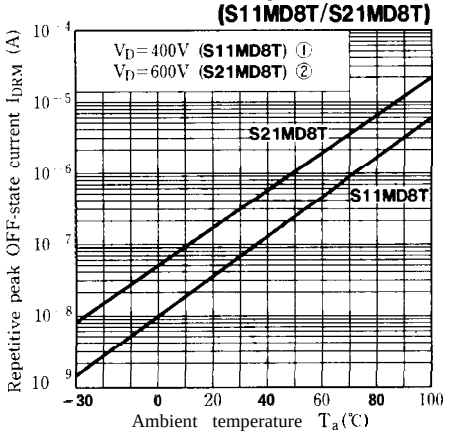


Fig. 9-b Repetitive Peak OFF-state Current vs. Ambient Temperature (S11MD8T/S21MD8T)



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

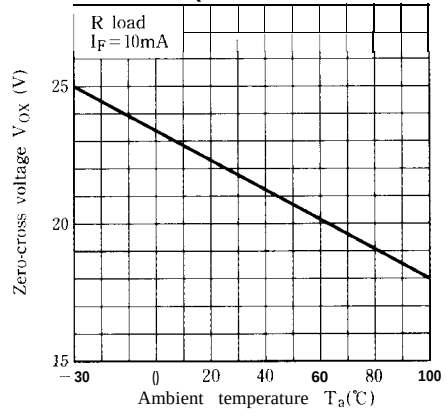
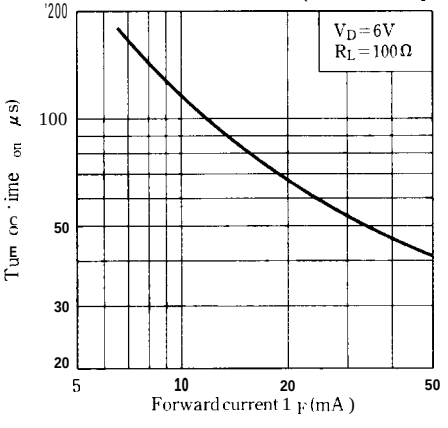


Fig.11-a Turn-on Time vs. Forward Current (s11 MD7T)



7

Phototriac Couplers

Fig.11-b Turn-on Time vs. Forward Currant (S1 1MD8T/S21MD8T)

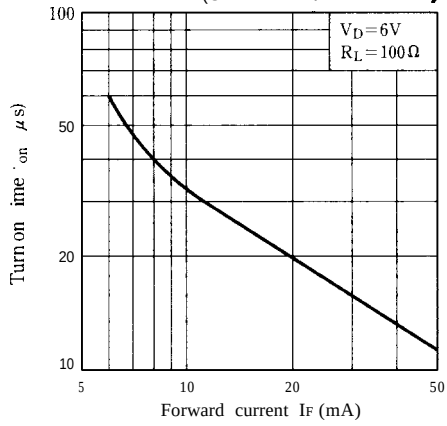


Fig.11-c Turn-on Time vs. Forward Current (S1 IMD9T/S21MD7T/S21 MD9T)

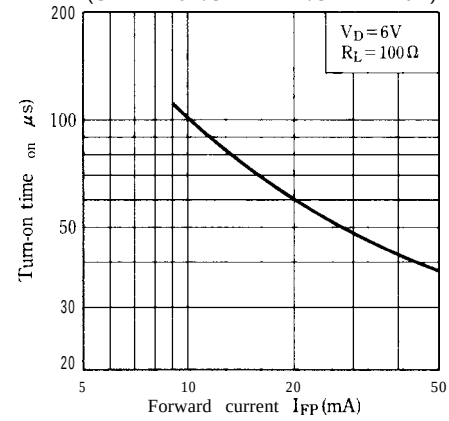


Fig.12-a ON-state Current vs. ON-state Voltage (S11MD7T/S21MD7T/S11MD9T/S21MD9T)

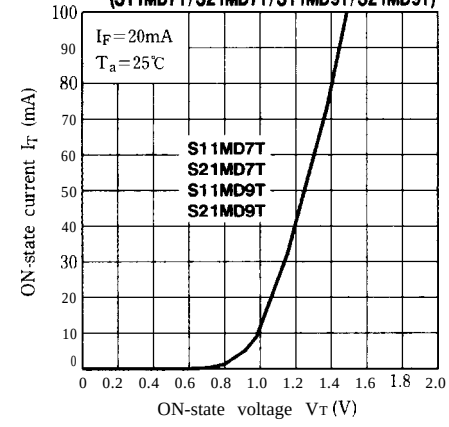
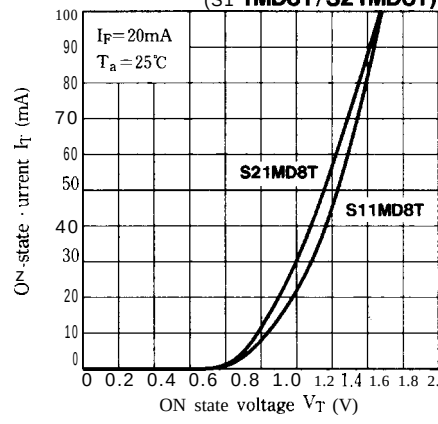
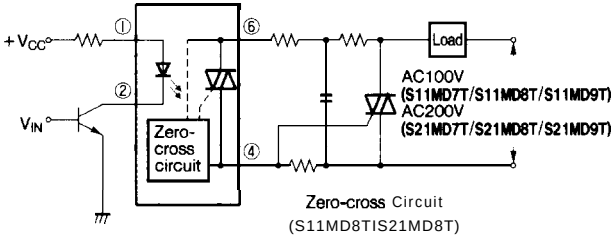


Fig.12-b ON-state Current vs. ON-state Voltage (S1 1MD8T/S21MD8T)



■ Basic Operation Circuit

S11 MD7T/sl1MD8TIS11 MD9T
S21MD7TIS21MD8T/S21MD9T



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