

# S22MD1V/S22MD3

※ Lead forming type (I type) and taping reel type (P type) of **S22MD1V** are also available (**S22MD1VI/S22MD1P**)

※ TÜV (DIN-VDE0884) approved type is also available as an option.

## ■ Features

1. High repetitive peak OFF-state voltage  
(  $V_{DRM}$  : MIN. 600V )
2. Low trigger current  
(  $I_{FT}$  : MAX. 10mA at  $R_G = 20k\Omega$  )
3. High isolation voltage between input and output  
**S22MD1V** ...  $V_{iso}$  : 5 000V<sub>rms</sub>  
**S22MD3V** ...  $V_{iso}$  : 2 500V<sub>rms</sub>
4. **S22MD1V** and **S22MD3** are for 200V line.
4. Recognized by UL, file NO. 64380

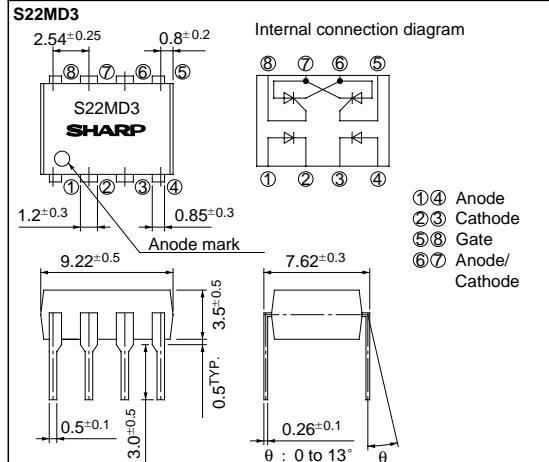
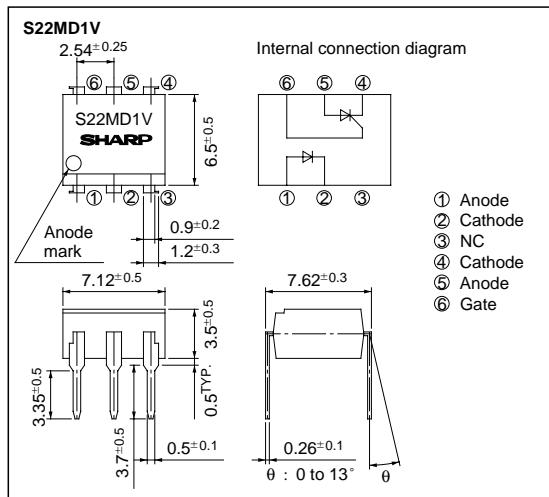
## ■ Applications

1. ON-OFF operation for a low power load
2. For triggering high power thyristor and triac

## Photothyristor Coupler

### ■ Outline Dimensions

(Unit : mm)



<sup>1</sup> In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device..

## ■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter		Symbol	Rating		Unit
			S22MD1V	S22MD3	
Input	Forward current	I <sub>F</sub>	50		mA
	Reverse voltage	V <sub>R</sub>	6		V
Output	RMS ON-state current	I <sub>T</sub>	200		mA <sub>rms</sub>
	*1 Peak one cycle surge current	I <sub>surge</sub>	2		A
	*2 Repetitive peak OFF-state voltage	V <sub>DRM</sub>	600		V
	*2 Repetitive peak reverse voltage	V <sub>RRM</sub>	600	-	V
*3 Isolation voltage		V <sub>iso</sub>	5 000	2 500	V <sub>rms</sub>
Operating temperature		T <sub>opr</sub>	-30 to +100	-30 to +100	°C
Storage temperature		T <sub>stg</sub>	-55 to +125	-40 to +125	°C
*4 Soldering temperature		T <sub>sol</sub>	260		°C

\*1 50H z, sine wave

\*2 R<sub>G</sub> = 20kΩ

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

\*4 For 10 seconds

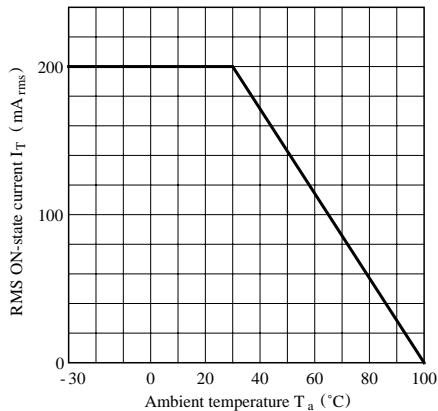
## ■ Electro-optical Characteristics

(Ta = 25°C)

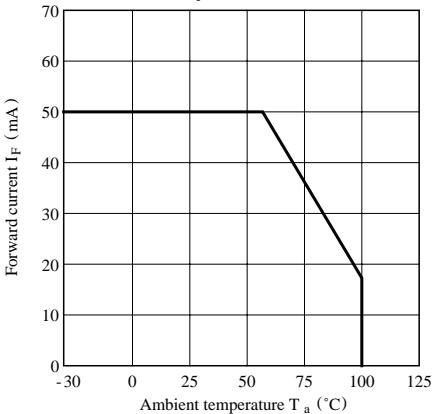
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 30mA	-	1.2	1.4	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 3V	-	-	10 <sup>-5</sup>	A
Output	Repetitive peak OFF-state current	I <sub>DRM</sub>	V <sub>DRM</sub> = Rated, R <sub>G</sub> = 20kΩ	-	-	10 <sup>-6</sup>	A
	*5 Repetitive peak reverse current	I <sub>RRM</sub>	V <sub>RRM</sub> = Rated, R <sub>G</sub> = 20kΩ	-	-	10 <sup>-6</sup>	A
	ON-state voltage	V <sub>T</sub>	I <sub>T</sub> = 200mA	-	1.0	1.4	V
	Holding current	I <sub>H</sub>	V <sub>D</sub> = 6V, R <sub>G</sub> = 20kΩ	-	0.2	1	mA
	Critical rate of rise of OFF-state voltage	S22MD1V S22MD3	dV/dt	V <sub>DRM</sub> = 1/√2 Rated, R <sub>G</sub> = 20kΩ	5	-	-
				V <sub>DRM</sub> = 1/√2 Rated, R <sub>G</sub> = 20kΩ	3	-	-
Transfer charac- teristics	Minimum trigger current	I <sub>FT</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 100Ω, R <sub>G</sub> = 20kΩ	-	-	10	mA
	Isolation resistance	R <sub>ISO</sub>	DC500V, 40 to 60% RH	5 × 10 <sup>10</sup>	10 <sup>11</sup>	-	Ω
	Turn-on time	t <sub>on</sub>	V <sub>D</sub> = 6V, R <sub>G</sub> = 20kΩ, R <sub>L</sub> = 100Ω, I <sub>F</sub> = 30mA	-	20	50	μs

\*5 Applies only to S22MD1V

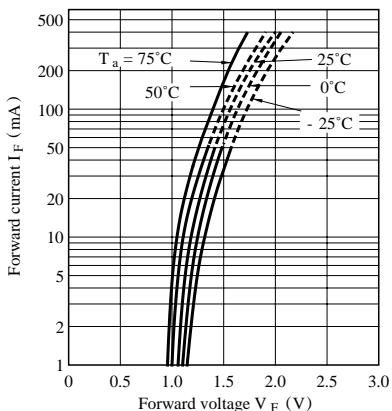
**Fig. 1 RMS ON-state Current vs. Ambient Temperature**



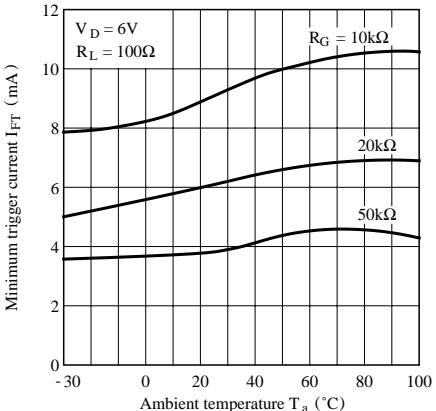
**Fig. 2 Forward Current vs. Ambient Temperature**



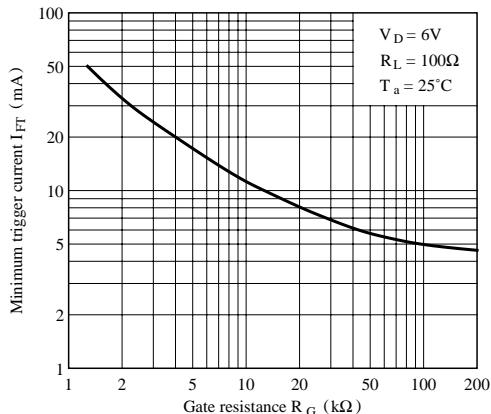
**Fig. 3 Forward Current vs. Forward Voltage**



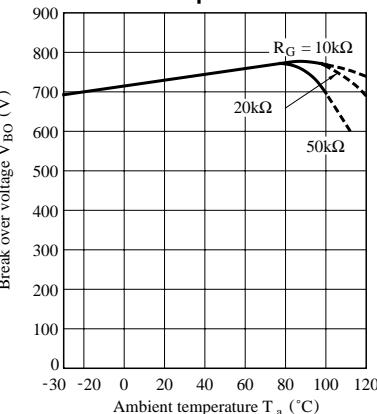
**Fig. 4 Minimum Trigger Current vs. Ambient Temperature**



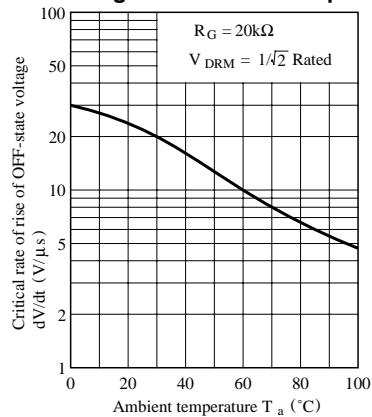
**Fig. 5 Minimum Trigger Current vs. Gate Resistance**



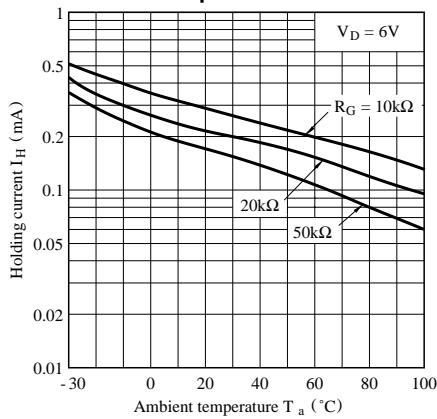
**Fig. 6 Break Over Voltage vs. Ambient Temperature**



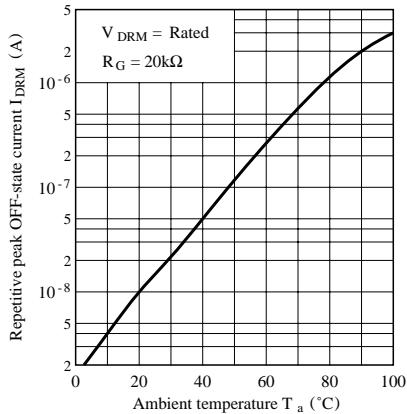
**Fig. 7 Critical Rate of Rise of OFF-state Voltage vs. Ambient Temperature**



**Fig. 8 Holding Current vs. Ambient Temperature**



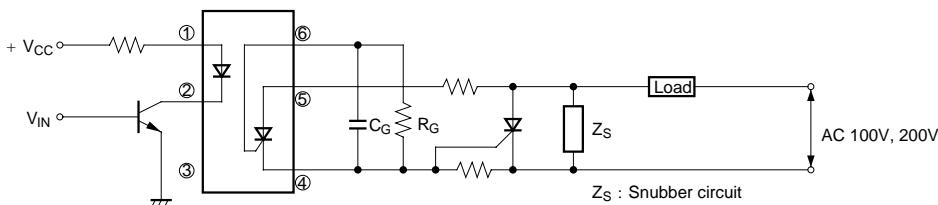
**Fig. 9 Repetitive Peak OFF-state Current vs. Ambient Temperature**



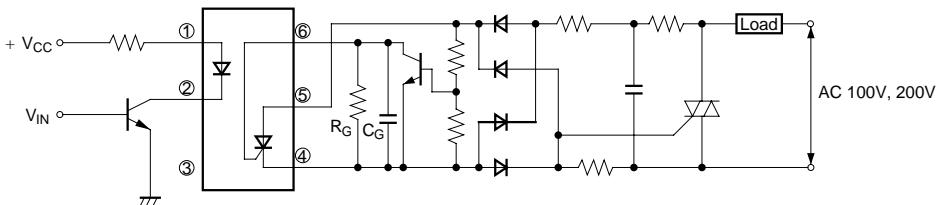
## ■ Basic Operation Circuit

### ● S22MD1V

Medium/High Power Thyristor Drive Circuit

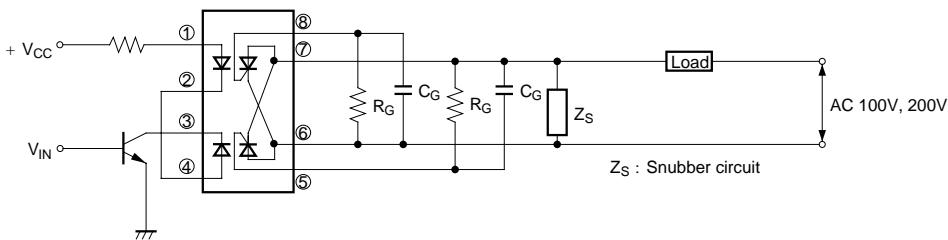


Medium/High Power Triac Drive Circuit (Zero-cross Operation)

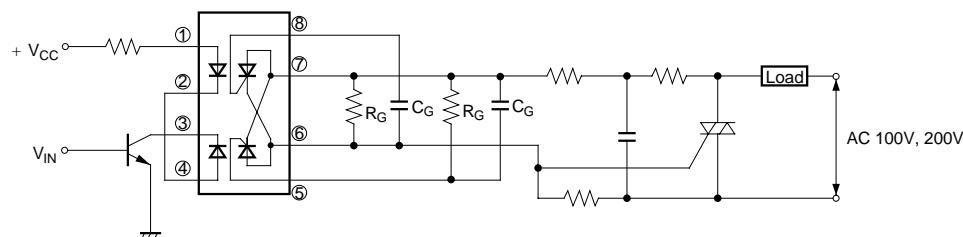


### ● S22MD3

Low Power Load Drive Circuit



Medium/High Power Triac Drive Circuit



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