

# S22MD1V/S22MD3

## Photothyristor Coupler

※ Lead forming type (I type) and taping reel type (P type) of S22MD1V are also available (S22MD1VI/S22MD1PI) (Page 656)  
 ※ TUV (DIN VDE0884) approved type is also available as an option.

### Features

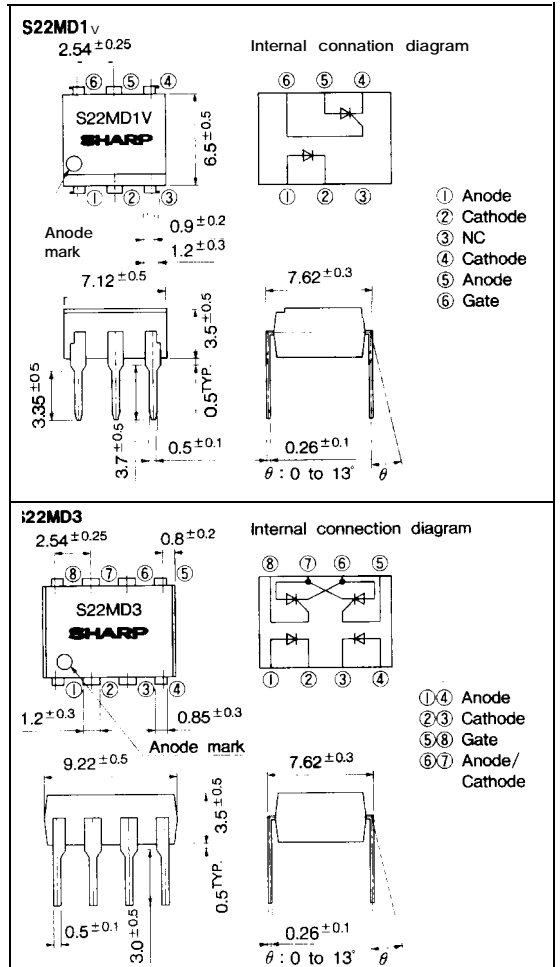
1. High repetitive peak OFF-state voltage ( $V_{DRM}$  : MIN. 600V)
2. Low trigger current ( $I_{FT}$  : MAX. 10mA at  $R_G=20k\Omega$ )
3. High isolation voltage between input and output  
 S22MD1V ...  $V_{iso}$  : 5 000V<sub>rms</sub>  
 S22MD3V ...  $V_{iso}$  : 2 500V<sub>rms</sub>
- ※ S22MD1 V 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

### Outline Dimensions

(Unit : mm)



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Photothyristor Couplers

## 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
	*3 Repetitive peak reverse voltage	V <sub>RRM</sub>	600	—	v
Isolation voltage		V <sub>iso</sub>	5000	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
Soldering temperature		T <sub>sol</sub>	260		°C

\*1 50 HZ, sine wave

\*2 R<sub>G</sub> = 20k Ω

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

\*4 For 10 seconds

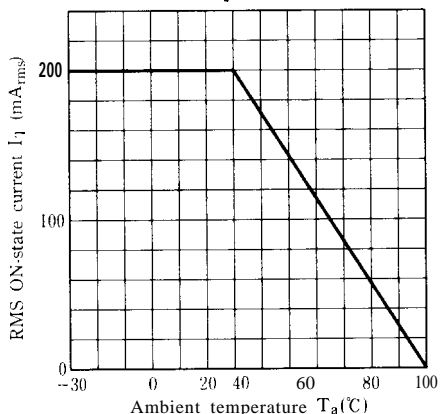
## Electro-optical Characteristics

(Ta = 25°C)

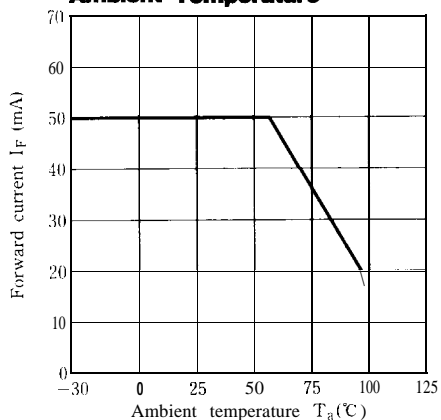
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 30mA	·	1.2	1.4	v
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 3V	—	—	10 <sup>-5</sup>	A
output	Repetitive peak OFF-state current	I <sub>DRM</sub>	V <sub>DRM</sub> = Rated, R <sub>G</sub> = 20k Ω	—	—	10 <sup>-6</sup>	A
	Repetitive peak reverse current	I <sub>RRM</sub>	V <sub>RRM</sub> = Rated, R <sub>G</sub> = 20k Ω	—	—	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> = 20k Ω	—	0.2	1	mA
	Critical rate of rise of OFF-state voltage	dV/dt	V <sub>DRM</sub> = 1/√2 Rated, R <sub>G</sub> = 20k Ω	5	—	—	V/μs
	3			—	—		
Transfer characteristics	Minimum trigger current	I <sub>FT</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 100Ω, R <sub>G</sub> = 20k Ω	—	—	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> = 20k Ω, R <sub>L</sub> = 100Ω, I <sub>F</sub> = 30mA	—	20	50	μs

\*5 Applies only to S22MD1V

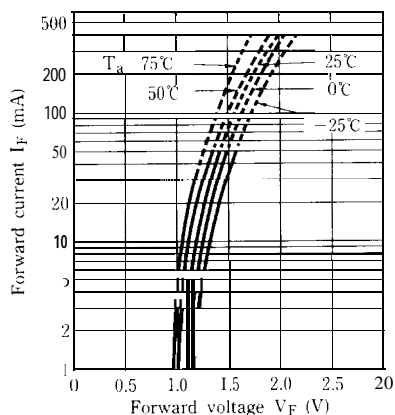
**Fig. 1 RMS ON-state Current vs. Ambient Temperature**



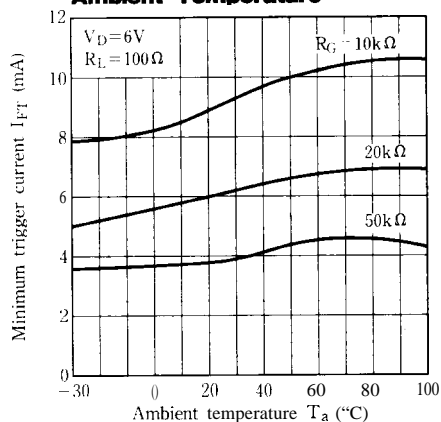
**Fig. 2 Forward Current vs. Ambient Temperature**



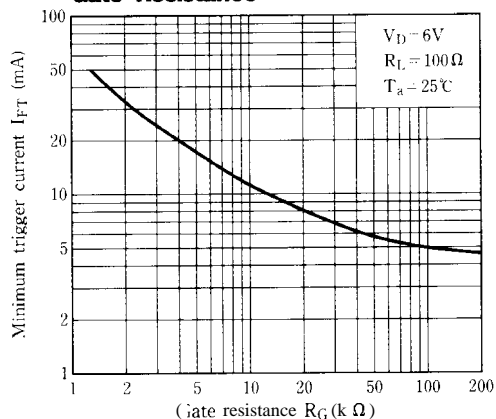
**Fig. 3 Forward Current vs. Forward Voltage**



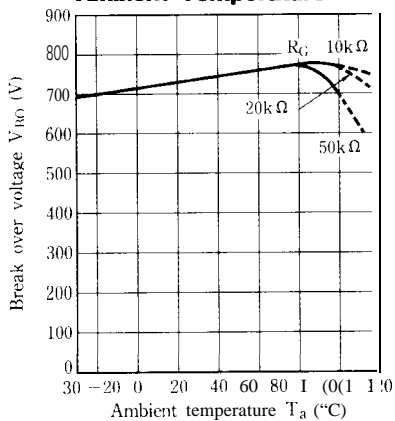
**Fig. 4 Minimum Trigger Current vs. Ambient Temperature**



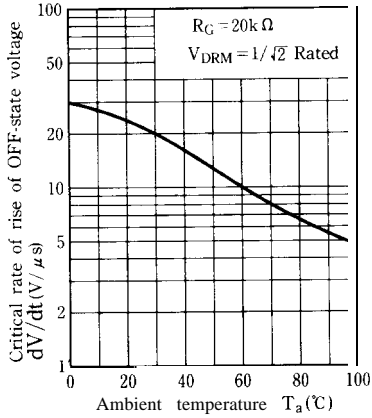
**Fig. 5 Minimum Trigger Current vs. Gate Resistance**



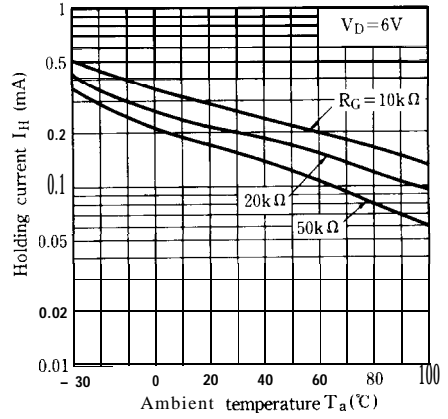
**Fig. 6 Break Over Voltage vs. Ambient Temperature**



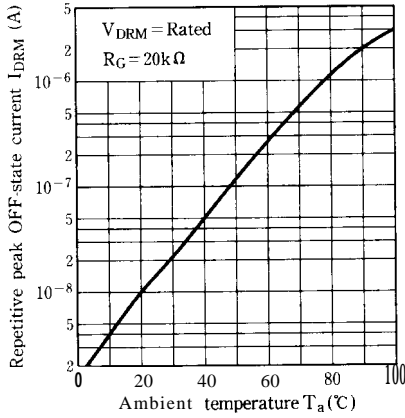
**Fig. 7 Critical Rate of Rise of OFF-state Voltage vs. Ambient Temperature**



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



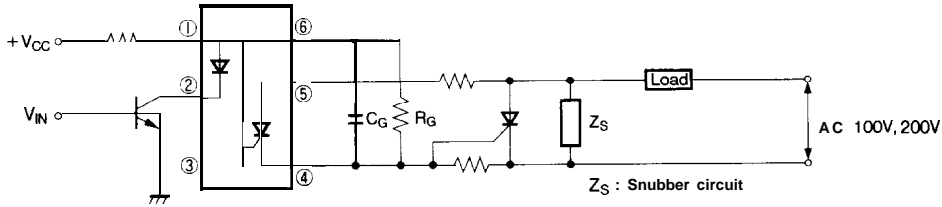
**Fig. 9 Repetitive Peak OFF-state Current vs. Ambient Temperature**



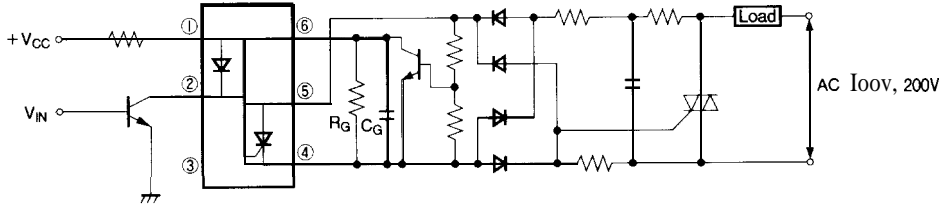
■ Basic Operation Circuit

●S22MD1V

Medium/High Power Thyristor Drive Circuit

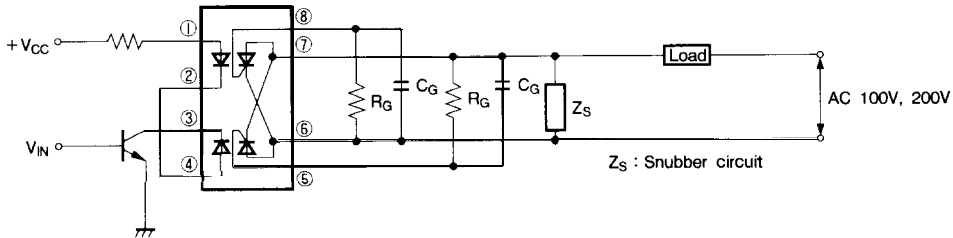


Medium/High Power Triac Drive Circuit (Zero-cross Operation)

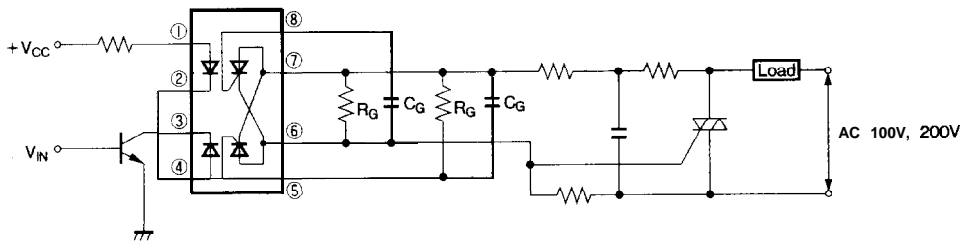


●S22MD3

Low Power Load Drive Circuit



Medium High Power Triac Drive Circuit



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