

# S22MD2

## Photothyristor Coupler

### ■ Features

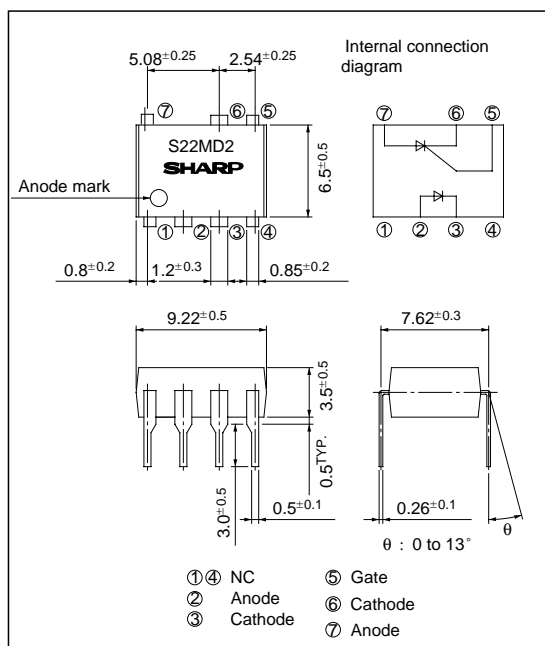
1. Long distance between anode and cathode of photothyristor on the output side : 5.08mm
  2. High repetitive peak OFF-state voltage ( $V_{DRM}$  : MIN. 600V)
  3. Low trigger current ( $I_{FT}$  : MAX. 8mA at  $R_G = 20k\Omega$ )
  4. High isolation voltage between input and output ( $V_{iso}$  : 5 000V<sub>rms</sub>)
- \* S22MD2 is for 200V line.

### ■ Applications

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

### ■ Outline Dimensions

(Unit : mm)



### ■ Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	6	V
Output	RMS ON-state current	$I_T$	200	mA <sub>rms</sub>
	*1Peak one cycle surge current	$I_{surge}$	2	A
	*2Repetitive peak OFF-state voltage	$V_{DRM}$	600	V
	*2Repetitive peak reverse voltage	$V_{RRM}$	600	V
	*3Isolation voltage	$V_{iso}$	5 000	V <sub>rms</sub>
Operating temperature		$T_{opr}$	- 30 to + 100	$^\circ\text{C}$
Storage temperature		$T_{stg}$	- 40 to + 125	$^\circ\text{C}$
*4Soldering temperature		$T_{sol}$	260	$^\circ\text{C}$

\*1 50Hz, sine wave

\*2  $R_G = 20k\Omega$

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

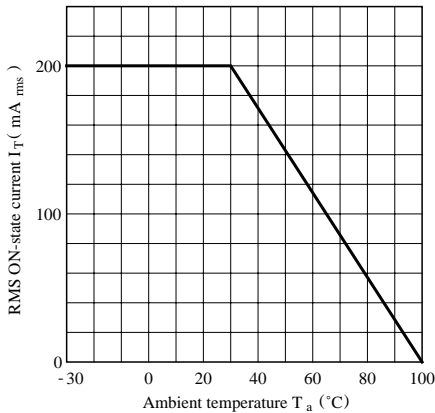
\*4 For 10 seconds

**Electro-optical Characteristics**

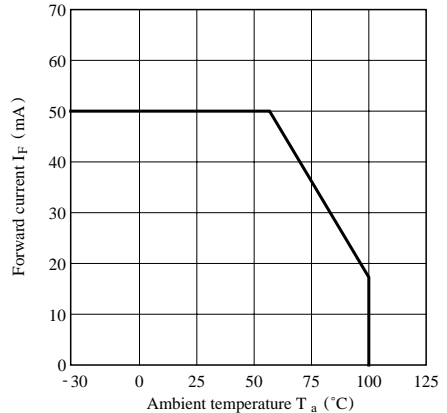
( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_F$	$I_F = 30\text{mA}$	-	1.2	1.4	V
	Reverse current	$I_R$	$V_R = 4\text{V}$	-	-	$10^{-5}$	A
Output	Repetitive peak OFF-state current	$I_{DRM}$	$V_{DRM} = \text{Rated}, R_G = 20\text{k}\Omega$	-	-	$10^{-6}$	A
	Repetitive peak reverse current	$I_{RRM}$	$V_{RRM} = \text{Rated}, R_G = 20\text{k}\Omega$	-	-	$10^{-6}$	A
	ON-state voltage	$V_T$	$I_T = 200\text{mA}$	-	1.0	1.4	V
	Holding current	$I_H$	$V_D = 6\text{V}, R_G = 20\text{k}\Omega$	-	0.3	1	mA
	Critical rate of rise of OFF-state voltage	$dV/dt$	$V_{DRM} = 1/\sqrt{2} \text{ Rated}, R_G = 20\text{k}\Omega$	3	-	-	V/ $\mu\text{s}$
Transfer-characteristics	Minimum trigger current	$I_{FT}$	$V_D = 6\text{V}, R_L = 100\Omega, R_G = 20\text{k}\Omega$	-	6	8	mA
	Isolation resistance	$R_{ISO}$	DC500V, 40 to 60% RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$
	Turn-on time	$t_{on}$	$V_D = 6\text{V}, R_G = 20\text{k}\Omega, R_L = 100\Omega, I_F = 30\text{mA}$	-	20	50	$\mu\text{s}$

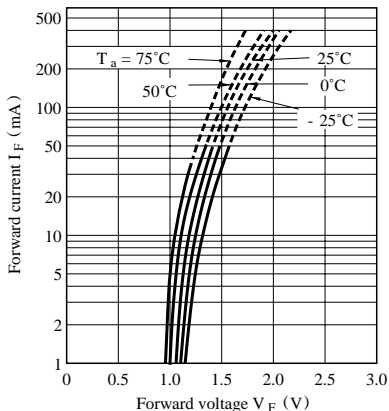
**Fig. 1 RMS ON-state Current vs. Ambient Temperature**



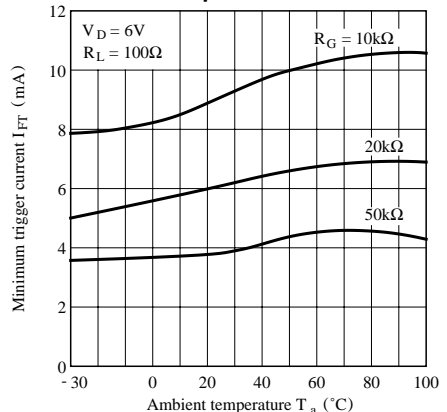
**Fig. 2 Forward Current vs. Ambient Temperature**



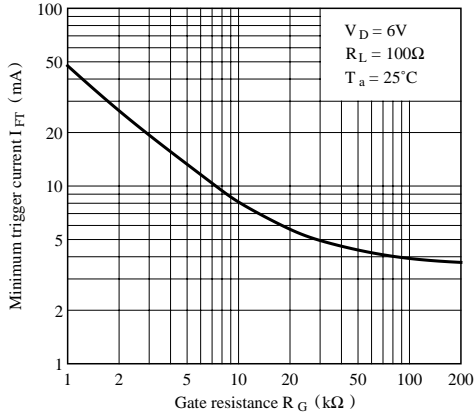
**Fig. 3 Forward Current vs. Forward Voltage**



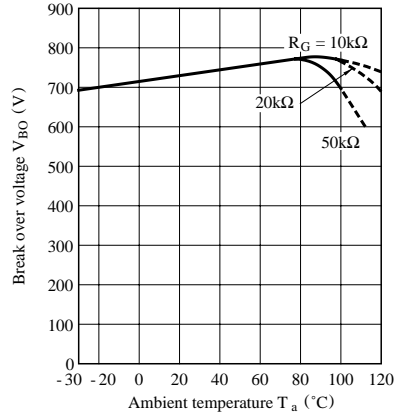
**Fig. 4 Minimum Trigger Current vs. Ambient Temperature**



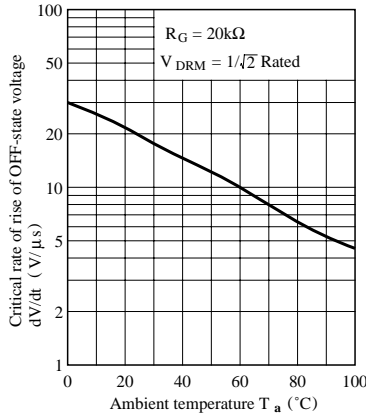
**Fig. 5 Minimum Trigger Current vs. Gate Resistance**



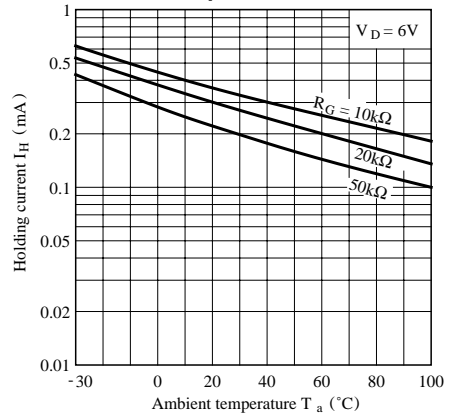
**Fig. 6 Break Over Voltage vs. Ambient Temperature**



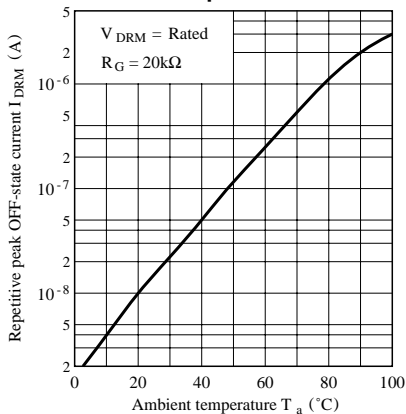
**Fig. 7 Critical Rate of Rise of OFF-state Voltage vs. Ambient Temperature**



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

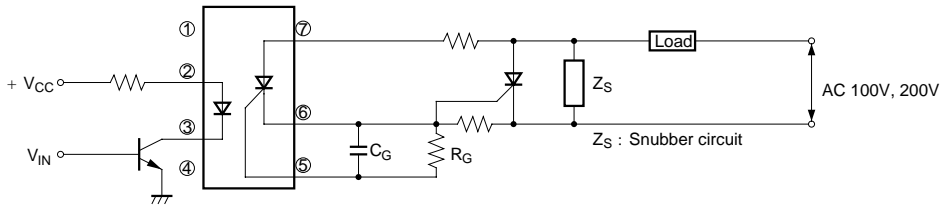


**Fig. 9 Repetitive Peak OFF-state Current vs. Ambient Temperature**

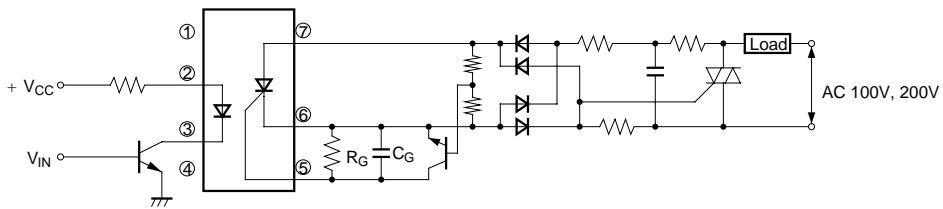


■ **Basic Operation Circuit**

**Medium/High Power Thyristor Drive Circuit**



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



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

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