

# S12ME1/S12ME1F

## European Safety Standard Approved, Long Creepage Distance Type Photothyristor Coupler

- ✿ Lead forming type (I type) and taping reel type (P type) of **S12ME1/S12ME1F** are also available. (**S12ME1I/S12ME1FI, S12ME1P/S12ME1FP**)
- ✿ DIN-VDE0884 approved type is also available as an option.

### ■ Features

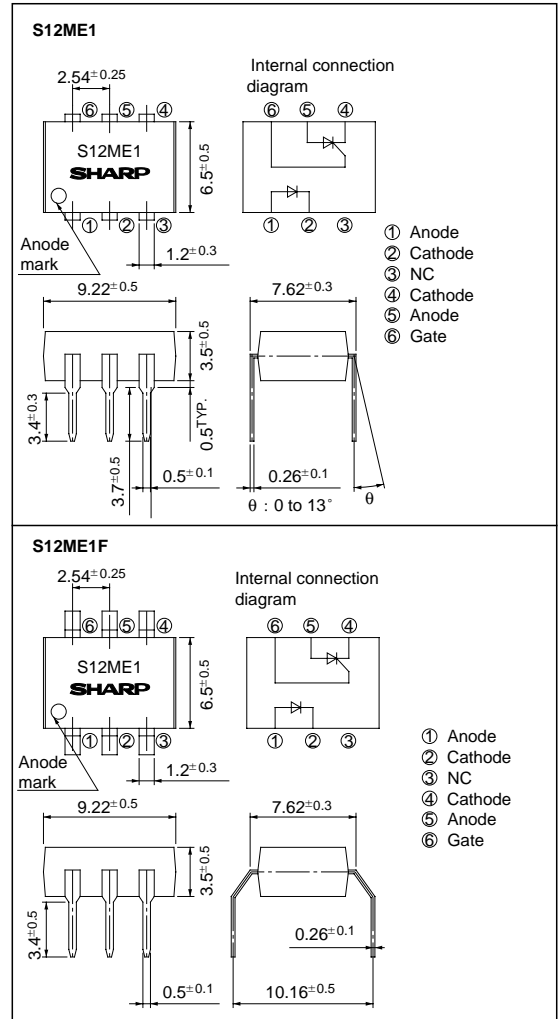
- Internal insulation distance : 0.4mm or more
- Creepage distance : 8mm or more  
Space distance : 5mm or more (**S12ME1**)  
8mm or more (**S12ME1F**)
- Recognized by UL file No. E64380  
Approved by BSI (BS415 : NO.7088, BS7002 : NO.7410)

### ■ Applications

- ON-OFF operation for low power load
- For triggering medium or high power thyristor and triac
- Over voltage detection of switching power supplies

### ■ Outline Dimensions

(Unit : mm)



## ■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter		Symbol	Rating	Unit
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>	0.2	A <sub>rms</sub>
	*1Peak one cycle surge current	I <sub>surge</sub>	2	A
	*2Repetitive peak OFF-state voltage	V <sub>DRM</sub>	400	V
	*2Repetitive peak OFF-state reverse voltage	V <sub>RRM</sub>	400	V
	*3Isolation voltage	V <sub>iso</sub>	4 000	V <sub>rms</sub>
Operating temperature		T <sub>opr</sub>	- 30 to +100	°C
Storage temperature		T <sub>sig</sub>	- 55 to +125	°C
*4Soldering temperature		T <sub>sol</sub>	260	°C

\*1 50Hz sine wave

\*2 R<sub>G</sub> = 20kΩ

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

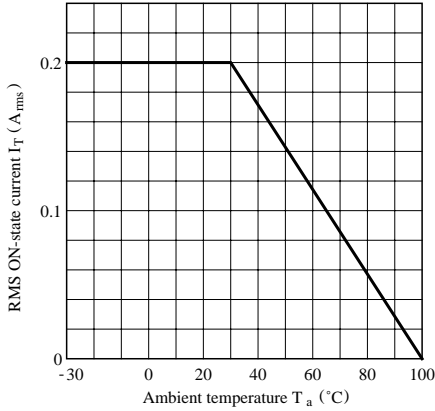
\*4 For 10 seconds

## ■ Electro-optical Characteristics

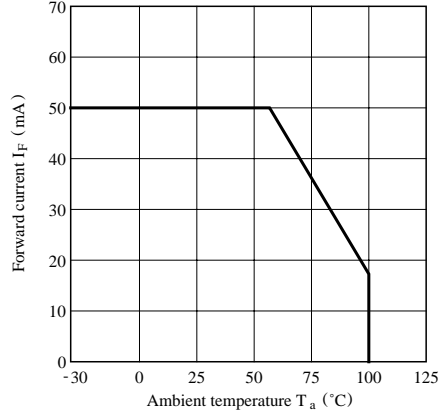
(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 20mA	-	1.2	1.4	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> = 3V	-	-	10	μA
Output	Repetitive peak OFF-state current	I <sub>DRM</sub>	V <sub>DRM</sub> = Rated, R <sub>G</sub> = 20kΩ	-	-	1	μA
	Repetitive peak OFF-state reverse voltage	I <sub>RRM</sub>	V <sub>DRM</sub> = Rated, R <sub>G</sub> = 20kΩ	-	-	1	μA
	ON-state voltage	V <sub>T</sub>	I <sub>T</sub> = 0.2A	-	1.0	1.4	V
	Holding current	I <sub>H</sub>	V <sub>D</sub> = 6V, R <sub>G</sub> = 20kΩ	-	-	1.0	mA
	Critical rate of rise of OFF-state voltage	dV/dt	V <sub>DRM</sub> = 1/√2 • Rated, R <sub>G</sub> = 20kΩ	3	-	-	V/μs
Transfer characteristics	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 x 10 <sup>10</sup>	10 <sup>11</sup>	-	Ω
	Turn-on time	t <sub>on</sub>	V <sub>D</sub> = 6V, R <sub>L</sub> = 100Ω, I <sub>F</sub> = 20mA R <sub>G</sub> = 20kΩ	-	-	50	μs

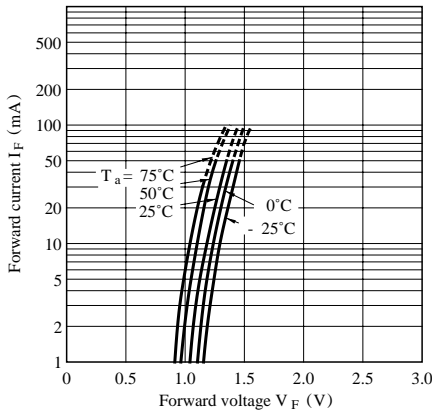
**Fig. 1 RMS ON-state Current vs. Ambient Temperature**



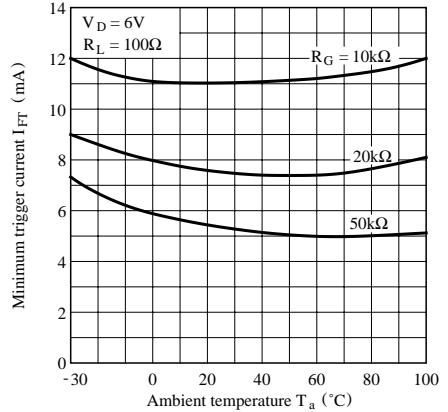
**Fig. 2 Forward Current vs. Ambient Temperature**



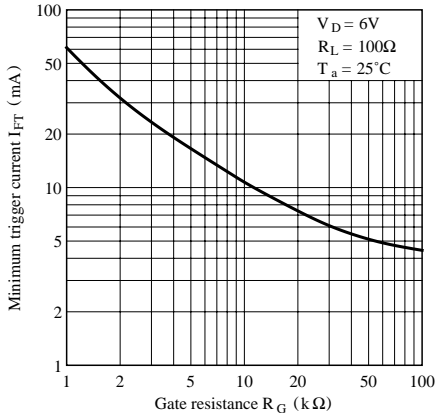
**Fig. 3 Forward Current vs. Forward Voltage**



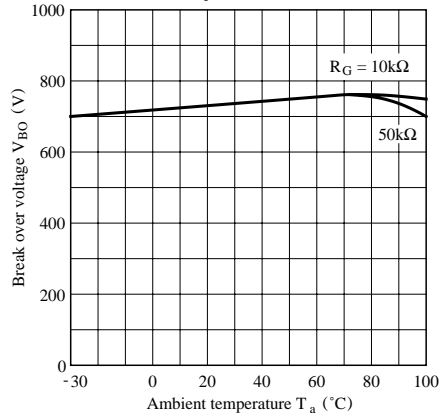
**Fig. 4 Minimum Trigger Current vs. Ambient Temperature**



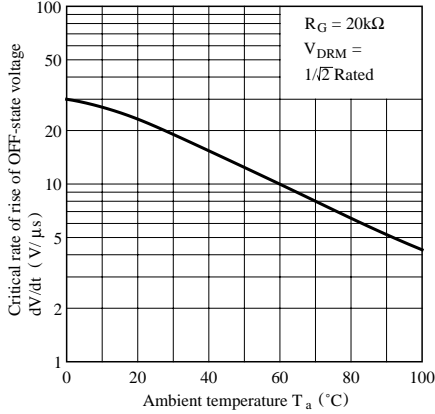
**Fig. 5 Minimum Trigger Current vs. Gate Resistance**



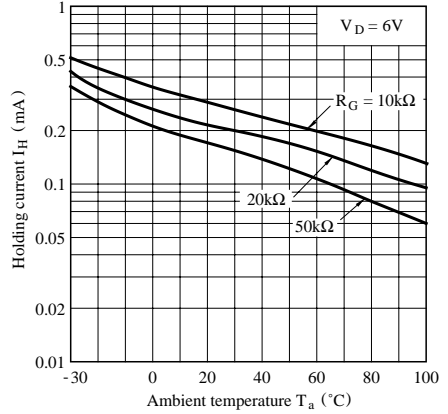
**Fig. 6 Break Over Voltage vs. Ambient Temperature**



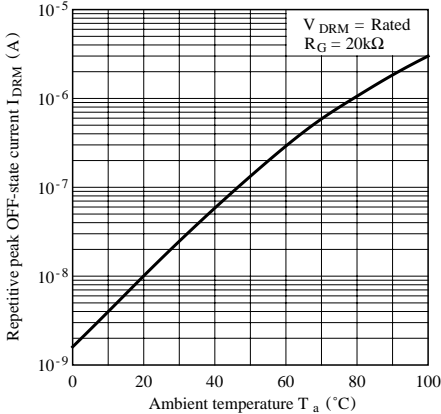
**Fig. 7 Critical Rate of Rise of OFF-state Voltage vs. Ambient Temperature**



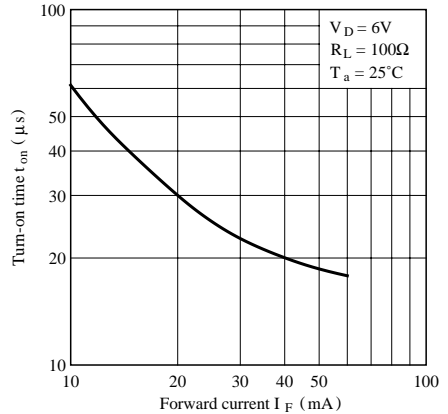
**Fig. 8 Holding Current vs. Ambient Temperature**



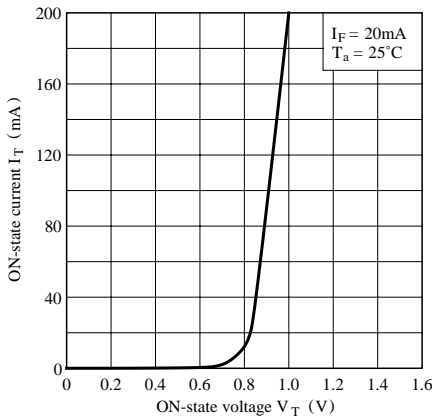
**Fig. 9 Repetitive Peak OFF-state Current vs. Ambient temperature**



**Fig.10 Turn-on Time vs. Forward Current**

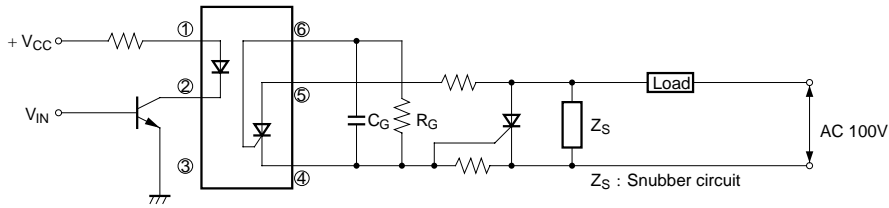


**Fig.11 ON-state Current vs. ON-state Voltage**

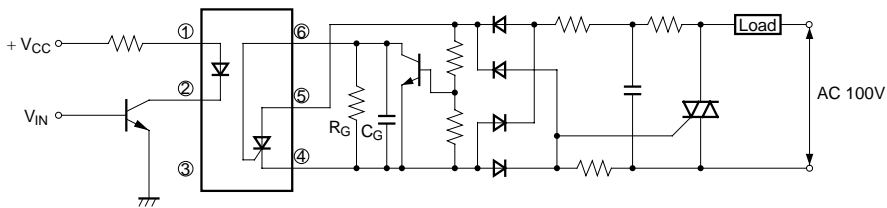


## ■ Basic Operation Circuit

### 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).