S21MD4V

Built-in Zero-cross Circuit, High Noise Resistance Type Phototriac Coupler

❋ Lead forming type of **S21MD4V** is also available. (**S21MD4W**)
❋❋ TÜV (DIN-VDE0884) approved type is also available as an option.

■ Features

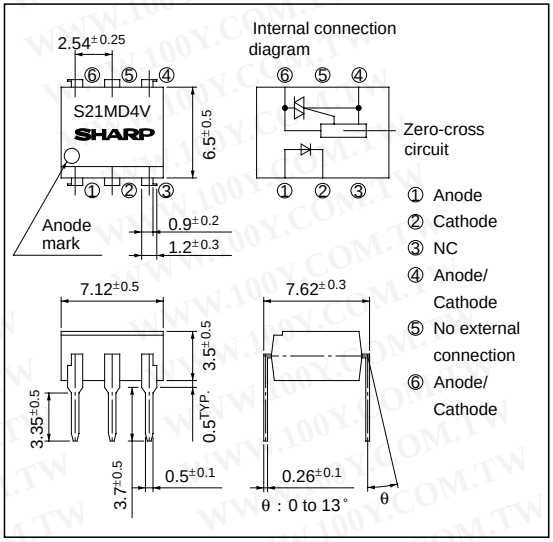
1. Built-in zero-cross circuit
2. High critical rate of rise of OFF-state voltage (dV/dt : MIN. 100V/μs)
3. High repetitive peak OFF-state voltage (V_{DRM} : MIN. 600V)
4. Isolation voltage between input and output V_{iso} : 5 000Vrms
5. UL recognized, file No. E64380 (**S21MD4V**/**S21MD4W**)

❋ **S21MD4V** is for 200V line

■ Applications

1. For triggering medium/high power triac

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (Ta = 25°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	100	mA_{rms}
	*1Peak one cycle surge current	I_{surge}	1.2	A
	Repetitive peak OFF-state voltage	V_{DRM}	600	V
*2Isolation voltage		V_{iso}	5 000	V_{rms}
Operating temperature		T_{opr}	- 30 to + 100	°C
Storage temperature		T_{stg}	- 55 to + 125	°C
*3Soldering temperature		T_{sol}	260	°C

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

■ Electro-optical Characteristics

(Ta = 25˚C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	I_F = 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	V_T	I_T = 100mA	-	1.7	2.5	V
	Holding current	I_H	V_D = 6V	0.1	1	3.5	mA
	Critical rate of rise of OFF-state voltage	dV/dt	V_{DRM} = $1/\sqrt{2}$ Rated	100	-	-	V/μs
	Zero-cross voltage	V_{OX}	Resistance load, I_F = 15mA	-	-	35	V
Transfer characteristics	Minimum trigger current	I_{FT}	V_D = 6V, R_L = 100Ω	-	-	15	mA
	Isolation resistance	R_{ISO}	DC500V, 40 to 60% RH	5 x 10^{10}	10^{11}	-	Ω
	Turn-on time	t_{on}	V_D = 6V, R_L = 100Ω, I_F = 20mA	-	20	50	μs

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

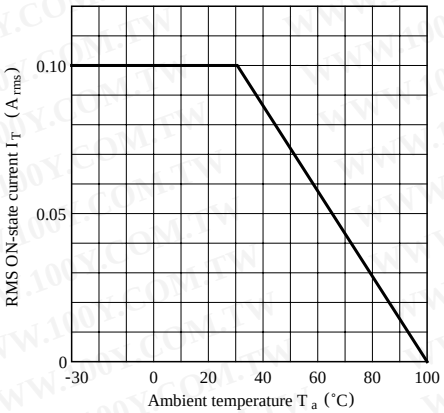


Fig. 2 Forward Current vs. Ambient Temperature

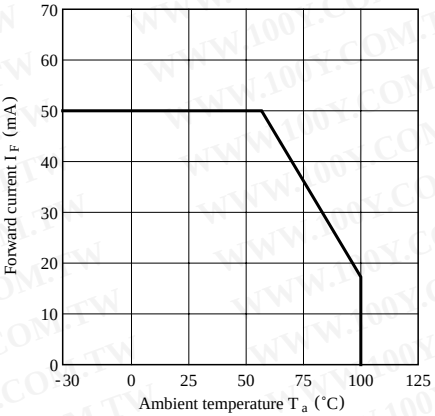


Fig. 3 Forward Current vs. Forward Voltage

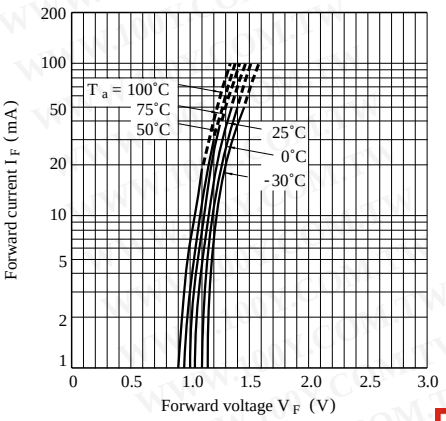


Fig. 4 Minimum Trigger Current vs. Ambient Temperature

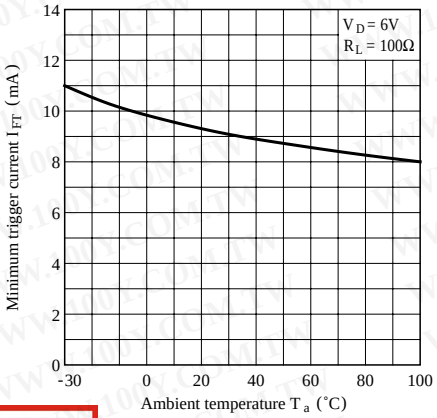


Fig. 5 Relative Repetitive Peak OFF-state Voltage vs. Ambient Temperature

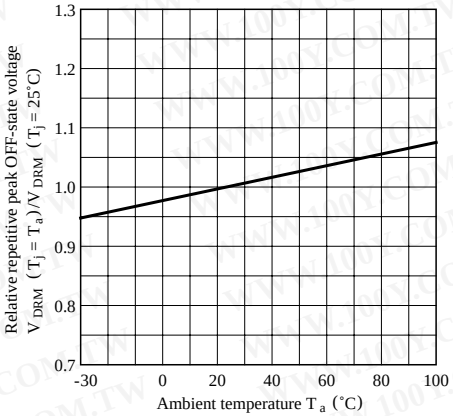


Fig. 6 ON-state Voltage vs. Ambient Temperature

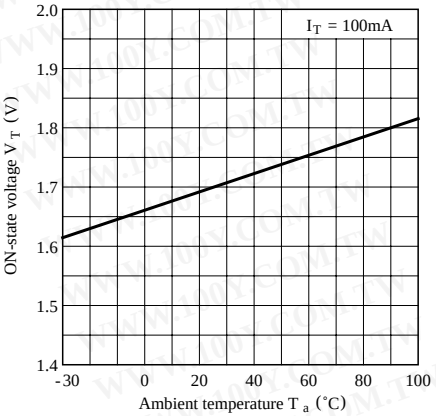


Fig. 7 Holding Current vs. Ambient Temperature

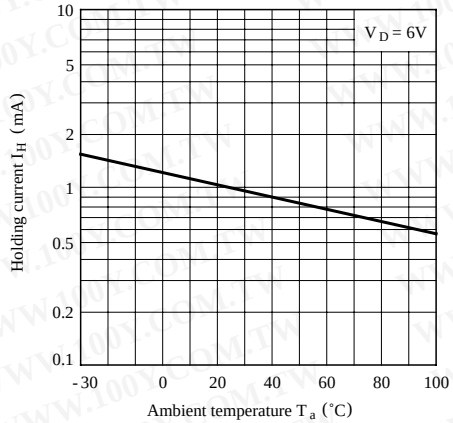


Fig. 8 Repetitive Peak OFF-state Current vs. OFF-state Voltage

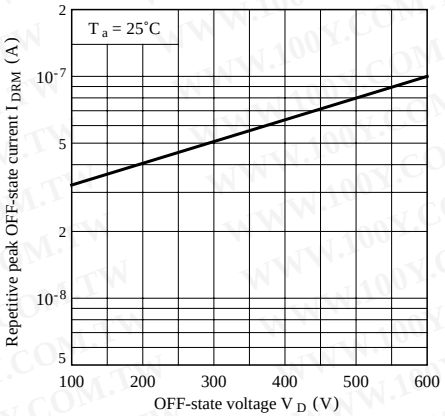


Fig. 9 Repetitive Peak OFF-state Current vs. Ambient Temperature

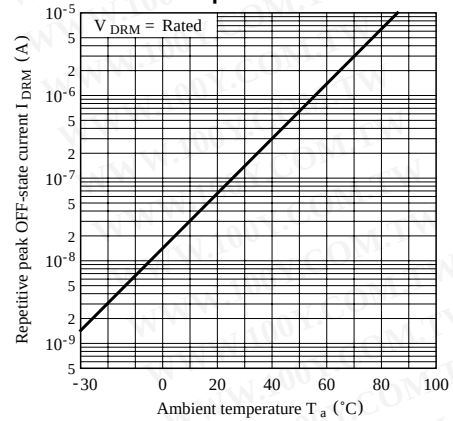


Fig.10 Zero-cross Voltage vs. Ambient Temperature

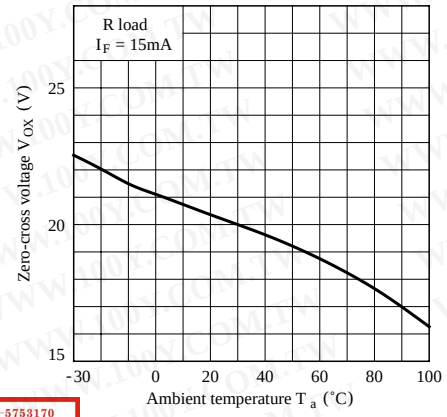
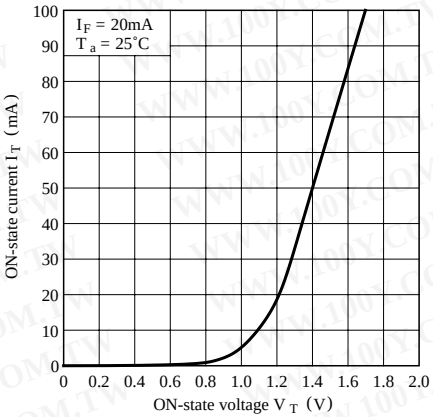
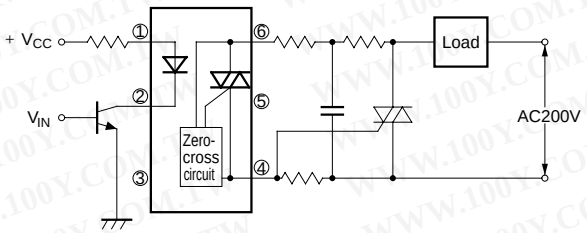


Fig.11 ON-state Current vs. ON-state Voltage



■ Basic Operation Circuit

Medium/High Power Triac Drive Circuit



Note) Please use on condition of the triac for power triggers.

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

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

(i) The devices in this publication are designed for use in general electronic equipment designs such as:
- Personal computers
- Office automation equipment
- Telecommunication equipment [terminal]
- Test and measurement equipment
- Industrial control
- Audio visual equipment
- Consumer electronics

(ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
- Traffic signals
- Gas leakage sensor breakers
- Alarm equipment
- Various safety devices, etc.

(iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
- Space applications
- Telecommunication equipment [trunk lines]
- Nuclear power control equipment
- Medical and other life support equipment (e.g., scuba).

- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
- This publication is the proprietary product of SHARP and is copyrighted, with all rights reserved. Under the copyright laws, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP. Express written permission is also required before any use of this publication may be made by a third party.
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.