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SHARP

ELECTRONIC COMPONENTS
GROUP SHARP CORPORATION

SPECIFICATION

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PAGE 9 Pages

REPRESENTATIVE DIVISION

OPTO-ELECTRO' MC
DEVICES DIV.

DEVICE SPECIFICATION FOR

PHOTOTRIAC COUPLER

MODEL No,

S21ME8

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2. Please obey the instructions mentioned below for actual use of this device.
SHARP takes no responsibility for damage caused by improper use of the devices.

(1) This device is designed for general electronic equipment.
Main uses of this device are as follows:

- Computer • OA equipment • Telecommunication equipment (Terminal)
- Measuring equipment • Tooling machine • AV equipment • Home appliance, etc.

(2) Please take proper steps in order to maintain reliability and safety, in case this device is used for the uses mentioned below which require high reliability.

- Unit concerning control and safety of a vehicle (air plane, train, automobile etc.)
- Traffic signal • Gas leak detection breaker • Fire box and burglar alarm box
- Other safety equipment, etc.

(3) Please do not use for the uses mentioned below which require extremely high reliability.

- Space equipment • Telecommunication equipment (Trunk)
- Nuclear control equipment • Medical equipment etc.

Contact a SHARP representative of sales office in advance when you intend to use SHARP devices for any applications other than those applications for general electronic equipment recommend by SHARP at (1).

CUSTOMER'S APPROVAL

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BY

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SHARP CORPORATION

1. Application

This specification applies to the outline and characteristics of phototriac coupler Model No. S21 ME8.

2. Outline

Refer to the attached drawing No. CY8238E02.

3. Ratings and characteristics

Refer to the attached sheet, page 4 to 6.

4. Reliability

Refer to the attached sheet, page 7.

5. Incoming inspection

Refer to the attached sheet, page 8.

6. Supplement

6.1 Isolation voltage shall be measured in the following method.

- (1) Short between pin 1, 2 and pin 3 on the primary side and between pin 4,5 and pin 6 on the secondary side.
- (2) The dielectric withstand tester with zero-cross circuit shall be used.
- (3) The wave form of the applied voltage shall be a sine wave.
(It is recommended that the isolation voltage be measured in insulation oil.)

6.2 The business dealing name used for this product when ordered or delivered shall be S21ME8.

6.3 This product is not designed against irradiation.

This product is assembled with electrical input and output.

This product incorporates non-coherent light emitting diode.

REFERENCE

7. Notes

7.1 For cleaning

- (1) Solvent cleaning : Solvent temperature 45°C or less
Immersion for 3 min or less
- (2) Ultrasonic cleaning : The affect to device by ultrasonic cleaning is different by cleaning bath size, ultrasonic power output, cleaning time, PWB size or device mounting condition etc. Please test it in actual using condition and confirm that doesn't occur any defect before starting the ultrasonic cleaning.
- (3) Applicable solvent : Ethyl alcohol, Methyl alcohol
Freon TE · TF, Diflon-solvent S3-E

Please refrain form using Chloro Fluoro Carbon type solvent to clean device as much as possible since it is internationally restricted to protect the ozonosphere. Before you use alternative solvent you are requested to confirm that it does not attack package resin.

7.2 Usage

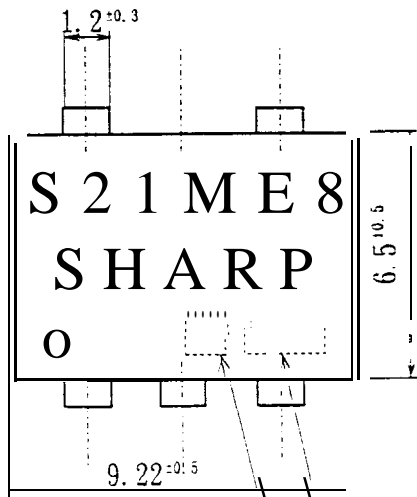
For triggering medium and power triac.
(This model shall be used in the ON state condition of triggering power triac.)

- 7.3 If the voltage exceeding the repetitive peak off-state voltage (V_{DRM}) in the absolute maximum ratings is applied to the phototriac, it may cause not only faulty operation but breakdown. Make sure that the surge voltage exceeding V_{DRM} shall not be applied by using the varistor, CR.
- 7.4 The LED used in the Phototriac coupler generally decreases the light emission power by operation. Also, as this product is using high sensitive phototriac chip, please consider that miss-operation may be caused by too much forward current. In case of long operation time, please decide the input current which become 2 -3 times of the Maximum value of the Minimum triggering current at circuit design with considering the degradation of the light emission power of the LED. (50% / 5years)

7.5 Precautions for Soldering Photocouplers

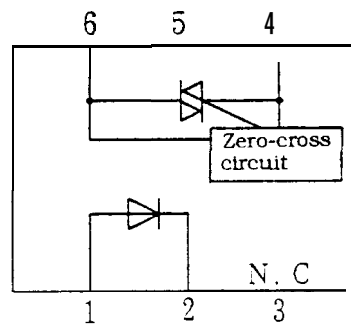
Refer to the attached sheet-1.

REFERENCE

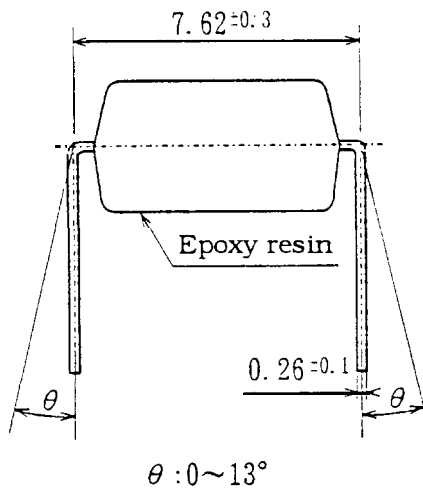
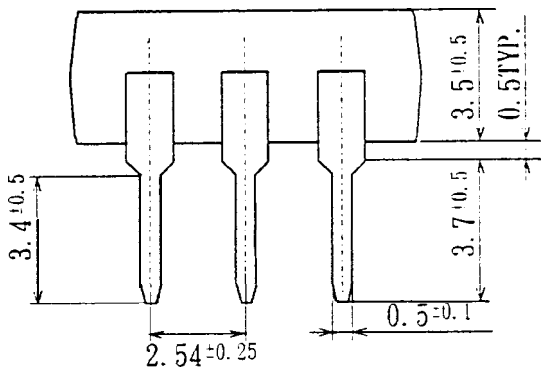


Lot No. ● 1

Factory identification mark *2



Pin Nos. and internal connection diagram



*1) 2-digit number shall be marked according to DIN standard.

*2) Factory identification mark shall be or shall not be marked.

UNIT: 1/1 mm	
Name	S21ME8 Outline Dimensions (Business dealing name : S21ME8)
Drawing No.	CY8238E02

REFERENCE

3.1 Absolute maximum ratings

Ta=25°C

Parameter		Symbol	Rating	unit
Input	Forward current	IF	15	mA
	Reverse voltage	V _R	6	v
output	RMS on-state current *1	I _T	0.1	Arms
	Peak one cycle surge current	I _{surge}	1.2 (50Hz sine wave)	A
	Repetitive peak off-state voltage	V _{DRM}	800	v
Operating temperature		T _{opr}	-30 to +100	c
Storage temperature		T _{stg}	-55 to +125	'c
Isolation voltage *2		V _{io}	5.0	kVrms
Soldering temperature		T _{sol}	260 (For 10s)	'c

*1 The derating factors of absolute maximum rating due to ambient temperature are shown in Fig.1, 2.

*2 AC for rein, 40 to 60%RH. f=60Hz

3.2 Electrical characteristics

Ta=25°C

	Parameter	symbol	MIN.	TYP.	MAX.	unit	Conditions
Input	Forward voltage	V_F	-	1.2	1.4	v	$I_F=6\text{mA}$
	Reverse current	I_R	-	-	10^{-5}	A	$V_R=3\text{V}$
output	Repetitive peak off-state current	I_{DRM}			10^{-6}	A	$V_{\text{DRM}}=\text{Rated}$
	On-state voltage	V_T	-	1.7	3.0	v	$I_T=0.1\text{A}$
	Holding current	I_H	0.1	-	3.5	mA	$V_D=6\text{V}$
	Critical rate of rise of off-state voltage	dv/dt	500	-	-	$\text{V}/\mu\text{s}$	$V_{\text{DRM}}=1/\sqrt{2}\cdot\text{Rated}$
	Zero-cross voltage	V_{ox}	-	-	20	v	R load, $I_F=6\text{mA}$
Transfer characteristics	Minimum trigger current	I_{FT}	-	-	3.0	mA	$V_D=6\text{V}$ $R_L=100\Omega$
	Isolation resistance	R_{iso}	5×10^{10}	10^{11}	-	Ω	DC500V 40 to 60%RH
	Turn on time	t_{ON}			50	μs	$V_D=6\text{V}, R_L=100\Omega$ $I_F=6\text{mA}$

Fig. 1 Forward current vs. ambient temperature

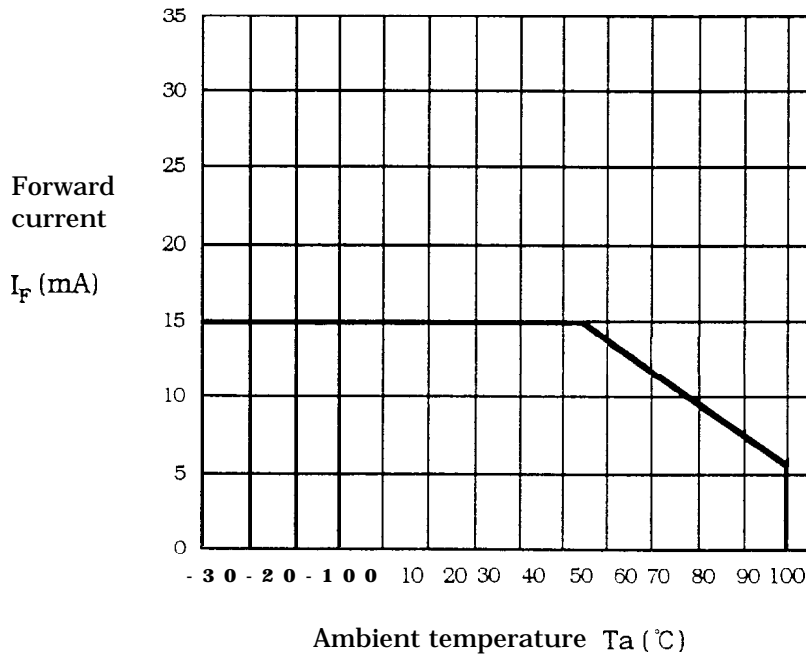
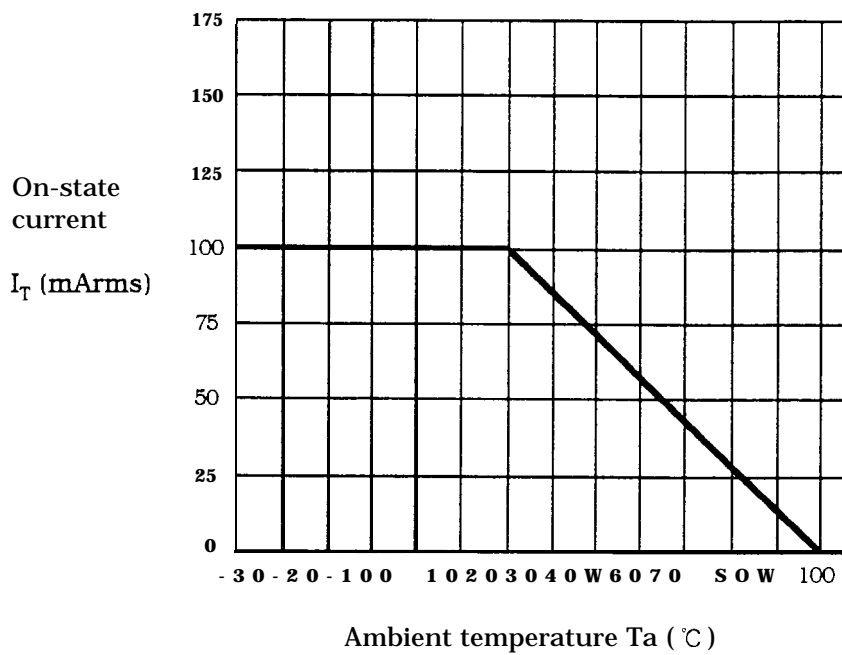


Fig.2 On-state current vs. ambient temperature



4. Reliability

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%
LTPD : 10 %/20%

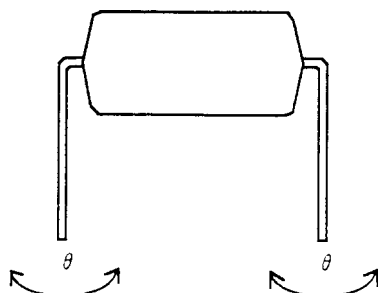
Test Items	Test Conditions *1	Failure Judgement Criteria	Samples (n) Defective(C)
Solderability *2	230°C, 5 s	—	n=11, C=0
Soldering heat *3	260°C, 10 s	$V_F > U \times 1.2$ $V_T > U \times 1.2$ $I_{FT} > U \times 1.3$ $I_R > U \times 2.0$ $I_{DRM} > U \times 2.0$ U : Upper specification limit L : Lower specification limit	n=11, C=0
Terminal strength (Tension)	Weight : 5.0N 5 s/each terminal		n=11, C=0
Terminal strength (Bending) *4	Weight : 2.5N 2 times/each terminal		n=11, C=0
Mechanical shock	15000m/s ² , 0.5ms 3 times/ ±X, ±Y, ±Z direction		n=11, C=0
Variable frequency vibration	100 to 2000 to 100Hz/4min 200m/s ² 4 times/ X, Y, Z direction		n=11, C=0
Temperature cycling	1 cycle -55 °C to +125°C (30min) (30min) 20 cycles test, Without Road		n=22, C=0
High temp. and high humidity storage	+60°C, 90%RH, 1000h		n=22, C=0
High temp. storage	+125°C, 1000h		n=22, C=0
Low temp. storage	-55°C, 1000h		n=22, C=0
Operation life	$I_F=15mA$, $I_T=100mA$ $T_a=25°C$, 1000h		n=22, C=0

*1 Test method, conforms to JIS C 7021.

*2 Solder shall adhere at the area of 95% or more of immersed portion of lead and pin hole or other holes shall not be concentrated on one portion.

*3 Dip into the position of 1.0mm from the resin part.

*4 Terminal bending direction is shown below.



5. Incoming inspection

5.1 Inspection items

(1) Electrical characteristics

$V_F, I_R, I_{DRM}, V_T, I_{FT}, R_{iso}, V_{iso}$

(2) Appearance

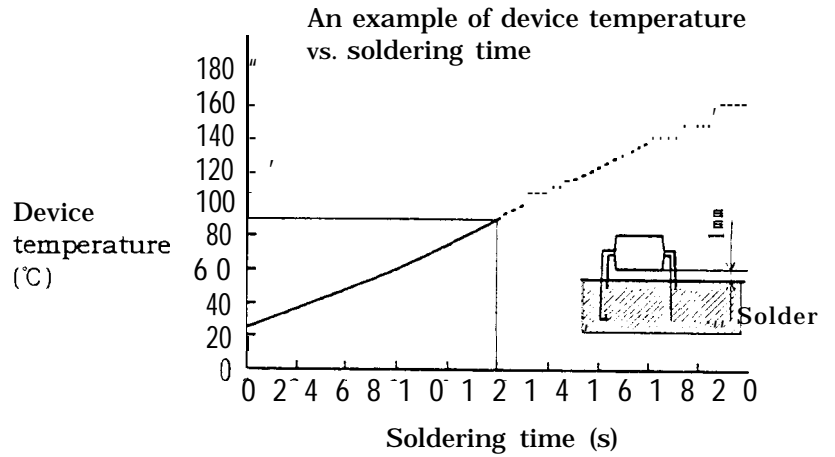
5.2 Sampling method and Inspection level

A single sampling plan, normal inspection level II based on ISO 2859 is applied. The AQL according to the inspection items are shown below.

Defect	Inspection item	AQL (%)
Major defect	Electrical characteristics Unreadable marking	0.1
Minor defect	Appearance defect except the above mentioned.	0.4

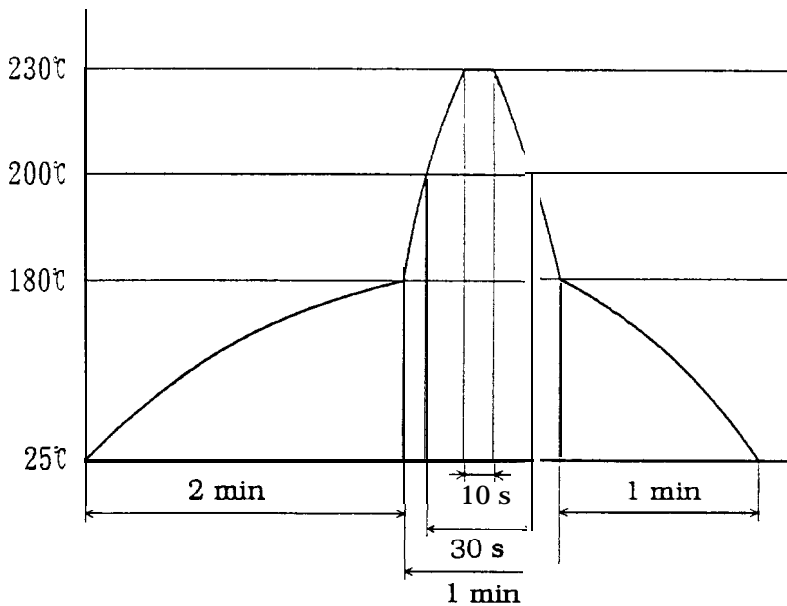
Precautions for Soldering Photocouplers

- In case of soldering to lead
260 °C 10 s or less



- If solder reflow :

It is recommended that only one soldering be done at the temperature and the time within the temperature profile as shown in the figure.



- Other precautions

An infrared lamp used to heat up for soldering may cause a localized temperature rise in the resin. So keep the package temperature within that specified in Item 2. Also avoid immersing the resin part in the solder.