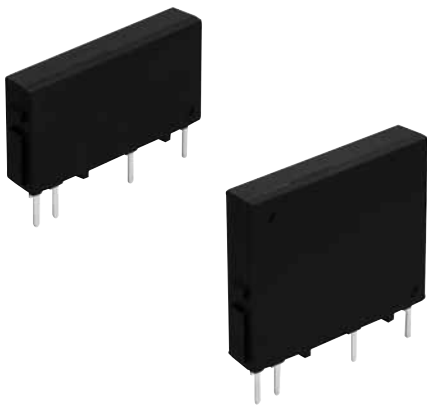




Slim type SSR for  
1 A and 2 A control

AQ-G RELAYS



RoHS compliant

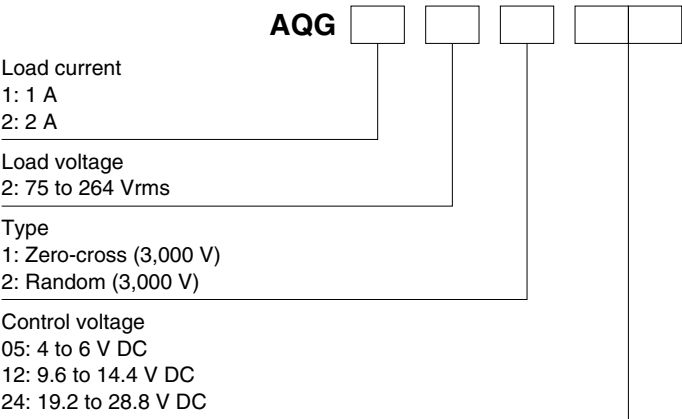
FEATURES

- 1. Space saving, Vertical size with a maximum thickness of 4.5 mm.  
Mounting space has been reduced to 30% (compared to conventional SSR's) while meeting high density PC board mounting requirements.
- 2. Snubber circuit preventing malfunction
- 3. Zero-cross type and Random type available
- 4. High dielectric strength of 3,000 Vrms  
(between input and output)
- 5. Snubber circuit integrated  
The snubber circuit is integrated to prevent malfunction caused by the rapid rise of voltage on the output side, such as inductive load and current.

TYPICAL APPLICATIONS

- Household appliances such as air conditioners, refrigerators and humidifiers
- Healthcare and medical equipment
- Industrial machinery such as NC machines, mounters, injection molders, and robots
- Microcomputer boards
- Amusement and amenity related equipment

ORDERING INFORMATION



TYPES

| Type       | Load current | Load voltage   | Control voltage   | Part No. |
|------------|--------------|----------------|-------------------|----------|
| Zero-cross | 1 A          | 75 to 264 Vrms | 4 to 6 V DC       | AQG12105 |
|            |              |                | 9.6 to 14.4 V DC  | AQG12112 |
|            |              |                | 19.2 to 28.8 V DC | AQG12124 |
|            | 2 A          | 75 to 264 Vrms | 4 to 6 V DC       | AQG22105 |
|            |              |                | 9.6 to 14.4 V DC  | AQG22112 |
|            |              |                | 19.2 to 28.8 V DC | AQG22124 |
| Random     | 1 A          | 75 to 264 Vrms | 4 to 6 V DC       | AQG12205 |
|            |              |                | 9.6 to 14.4 V DC  | AQG12212 |
|            |              |                | 19.2 to 28.8 V DC | AQG12224 |
|            | 2 A          | 75 to 264 Vrms | 4 to 6 V DC       | AQG22205 |
|            |              |                | 9.6 to 14.4 V DC  | AQG22212 |
|            |              |                | 19.2 to 28.8 V DC | AQG22224 |

Standard packing: Carton 20 pcs., Case 500 pcs.

## RATING

**1. Ratings** (Ambient temperature: 20°C 68°F, Input voltage ripple: 1% or less)

### 1) Zero-cross type

| Item       | Type                             | Part No.       |                  |                   |                |                  |                   | Remarks                                                     |
|------------|----------------------------------|----------------|------------------|-------------------|----------------|------------------|-------------------|-------------------------------------------------------------|
|            |                                  | AQG12105       | AQG12112         | AQG12124          | AQG22105       | AQG22112         | AQG22124          |                                                             |
| Input side | Rated voltage                    | 5 V DC         | 12 V DC          | 24 V DC           | 5 V DC         | 12 V DC          | 24 V DC           | *1                                                          |
|            | Control voltage                  | 4 to 6 V DC    | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC | 4 to 6 V DC    | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC |                                                             |
|            | Input impedance                  | Approx. 0.3 kΩ | Approx. 0.8 kΩ   | Approx. 1.6 kΩ    | Approx. 0.3 kΩ | Approx. 0.8 kΩ   | Approx. 1.6 kΩ    |                                                             |
|            | Drop-out voltage, min.           | 1 V            |                  |                   |                |                  |                   |                                                             |
|            | Reverse voltage                  | 3 V            |                  |                   |                |                  |                   |                                                             |
| Load side  | Max. load current                | 1 A*2          |                  |                   | 2 A*2          |                  |                   | 1 A:<br>Ta = Max. 40°C 104°F<br>2 A:<br>Ta = Max. 25°C 77°F |
|            | Load voltage                     | 75 to 264 Vrms |                  |                   |                |                  |                   |                                                             |
|            | Frequency                        | 45 to 65 Hz    |                  |                   |                |                  |                   |                                                             |
|            | Non-repetitive surge current     | 8 A*3          |                  |                   | 30 A*3         |                  |                   | In one cycle at 60 Hz                                       |
|            | Max. “OFF-state” leakage current | 1.5 mA         |                  |                   |                |                  |                   | at 60 Hz at 200 Vrms                                        |
|            | Max. “ON-state” voltage drop     | 1.6 V          |                  |                   |                |                  |                   | at Max. carrying current                                    |
|            | Min. load current                | 20 mA*4        |                  |                   |                |                  |                   |                                                             |

### 2) Random type

| 7. Random type |                                  | Part No.       |                  |                   |                |                  |                   | Remarks                                                     |
|----------------|----------------------------------|----------------|------------------|-------------------|----------------|------------------|-------------------|-------------------------------------------------------------|
| Item           | Type                             | AQG12205       | AQG12212         | AQG12224          | AQG22205       | AQG22212         | AQG22224          |                                                             |
| Input side     | Rated voltage                    | 5 V DC         | 12 V DC          | 24 V DC           | 5 V DC         | 12 V DC          | 24 V DC           | *1                                                          |
|                | Input voltage                    | 4 to 6 V DC    | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC | 4 to 6 V DC    | 9.6 to 14.4 V DC | 19.2 to 28.8 V DC |                                                             |
|                | Input impedance                  | Approx. 0.3 kΩ | Approx. 0.8 kΩ   | Approx. 1.6 kΩ    | Approx. 0.3 kΩ | Approx. 0.8 kΩ   | Approx. 1.6 kΩ    |                                                             |
|                | Drop-out voltage, min.           | 1 V            |                  |                   |                |                  |                   |                                                             |
|                | Reverse voltage                  | 3 V            |                  |                   |                |                  |                   |                                                             |
| Load side      | Max. load current                | 1 A*2          |                  |                   | 2 A*2          |                  |                   | 1 A:<br>Ta = Max. 40°C 104°F<br>2 A:<br>Ta = Max. 25°C 77°F |
|                | Load voltage                     | 75 to 264 Vrms |                  |                   |                |                  |                   |                                                             |
|                | Frequency                        | 45 to 65 Hz    |                  |                   |                |                  |                   |                                                             |
|                | Non-repetitive surge current     | 8 A*3          |                  |                   | 30 A*3         |                  |                   | In one cycle at 60 Hz                                       |
|                | Max. "OFF-state" leakage current | 1.5 mA         |                  |                   |                |                  |                   | at 60 Hz at 200 Vrms                                        |
|                | Max. "ON-state" voltage drop     | 1.6 V          |                  |                   |                |                  |                   | at Max. carrying current                                    |
|                | Min. load current                | 20 mA*4        |                  |                   |                |                  |                   |                                                             |

Notes: \*1. Refer to REFERENCE DATA "3. Input current vs. input voltage characteristics".

\*2. Refer to REFERENCE DATA "1. Load current vs. ambient temperature".

\*3. Refer to REFERENCE DATA "2. Non-repetitive surge current vs. carrying time".

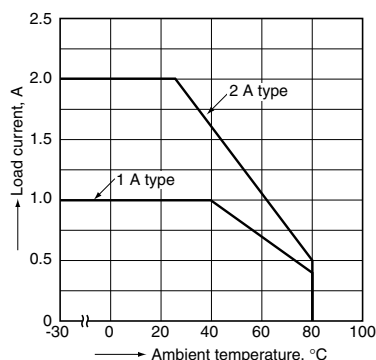
\*4. When the load current is less than the rated minimum load current, please refer to "Cautions for Use of Solid State Relays".

## 2. Characteristics (Ambient temperature: 20°C 68°F, Input voltage ripple: 1% or less)

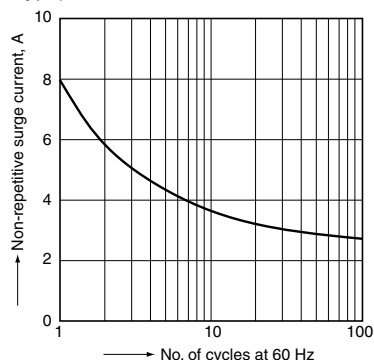
| Item                        | Zero-cross type                            | Random type                         | Remarks                            |
|-----------------------------|--------------------------------------------|-------------------------------------|------------------------------------|
| Operate time max.           | 1/2 cycle of voltage sine wave +1 ms       | 1 ms                                |                                    |
| Release time, max.          | 1/2 cycle of voltage sine wave +1 ms       |                                     |                                    |
| Insulation resistance, min. | 10 <sup>9</sup> Ω between input and output |                                     | at 500 V DC                        |
| Breakdown voltage           | 3,000 Vrms between input and output        |                                     | for 1 minute                       |
| Vibration resistance        | 10 to 55 Hz double amplitude of 0.75 mm    |                                     | X, Y, Z axes                       |
| Shock resistance            | Min. 1,000 m/s <sup>2</sup>                |                                     | X, Y, Z axes                       |
| Ambient temperature         | -30 to +80°C -22 to +176°F                 |                                     | Non-condensing at low temperatures |
| Storage temperature         | -30 to +100°C -22 to +212°F                |                                     | Non-condensing at low temperatures |
| Operational method          | Zero-cross (Turn-ON and Turn-OFF)          | Random turn ON, zero-cross turn OFF |                                    |

## REFERENCE DATA

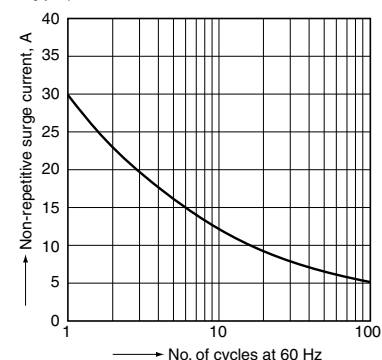
1. Load current vs. ambient temperature



2.-(1) Non-repetitive surge current vs. carrying time (1 A type)\*

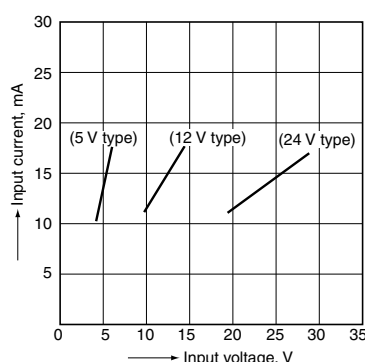


2.-(2) Non-repetitive surge current vs. carrying time (2 A type)\*

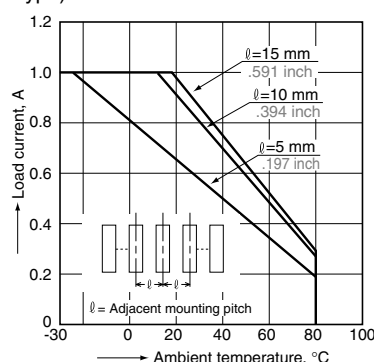


Note: \*The above chart shows non-repetitive maximum rating. If a surge current is applied repeatedly, please keep it approximately 50% or less than the values shown in the above graph.

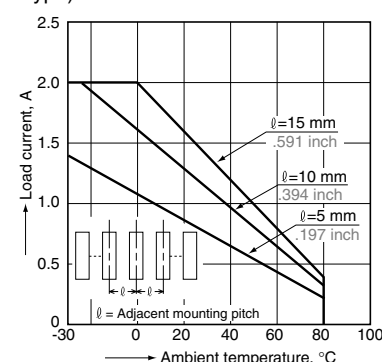
3. Input current vs. input voltage characteristics



4.-(1) Load current vs. ambient temperature characteristics for adjacent mounting (1 A type)



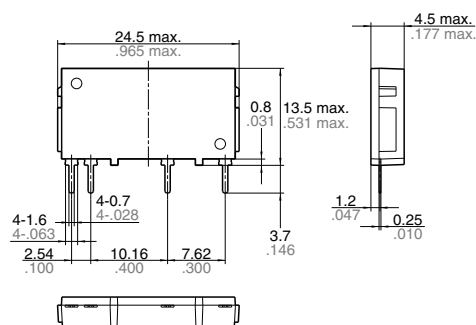
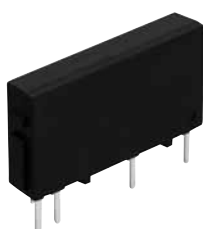
4.-(2) Load current vs. ambient temperature characteristics for adjacent mounting (2 A type)



## DIMENSIONS (mm inch)

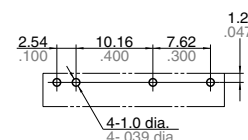
1. 1 A type

CAD



General tolerance:  $\pm 0.2 \pm .008$

PC board pattern (Bottom view)



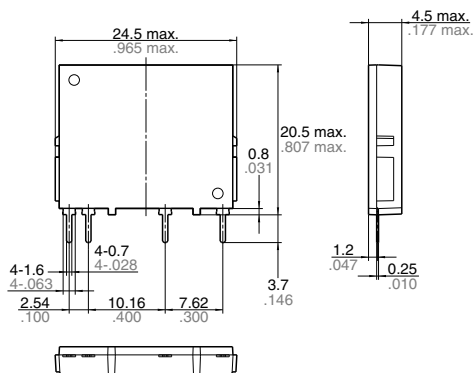
Tolerance:  $\pm 0.1 \pm .004$

Schematic



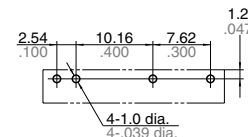
2. 2 A type

CAD



General tolerance:  $\pm 0.2 \pm .008$

PC board pattern (Bottom view)

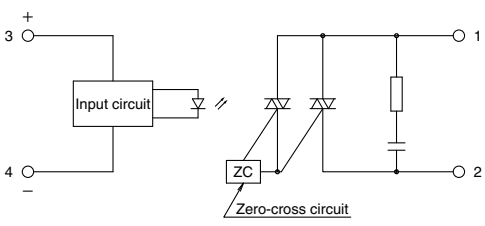
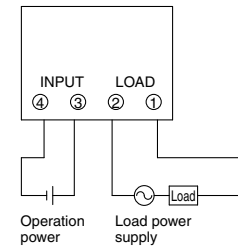


Tolerance:  $\pm 0.1 \pm .004$

Schematic



SCHEMATIC AND WIRING DIAGRAMS

| Schematic                                                                         | Output configuration | Load | Wiring diagram                                                                      |
|-----------------------------------------------------------------------------------|----------------------|------|-------------------------------------------------------------------------------------|
|  | 1 Form A             | AC   |  |

Recommended Temperature Controllers



**<KT4H Temperature Controller>**  
Our temperature controller is recommended for use with our Solid State Relays.

- Features**
- Space saving requiring only a depth of 65 mm
  - Data collection possible through a PLC using RS485 communication
  - Tool port is standard for easy data setting
  - Inverted LCD + backlight for good legibility with large characters
  - Excellent operability and rich optional control functions

**Substitute part numbers**

| Power supply    | Control output             | Part No.    |
|-----------------|----------------------------|-------------|
| 100 to 240 Vrms | Non-contact voltage output | AKT4H112100 |

\* For detailed product information about temperature controllers, please refer to our website:  
<https://industrial.panasonic.com/ac/e/>

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Please contact .....

**Panasonic Corporation**

Electromechanical Control Business Division

■ 1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan  
[industrial.panasonic.com/ac/e/](http://industrial.panasonic.com/ac/e/)

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