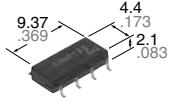
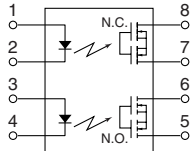


Both NO and NC contacts incorporated in a small SOP8-pin package

PhotoMOS Relays
GU SOP Form A & B
(AQW610S)



mm inch



Compliance with RoHS Directive

FEATURES

1. Normally open and normally closed contacts in a SOP package

The device comes in a miniature SOP measuring (W) 4.4 × (L) 9.37 × (H) 2.1 mm (W) .173 × (L) .369 × (H) .083 inch — approx. 38% of the volume and 66% of the footprint size of DIP type.

2. 60V type couples high capacity (0.45A) with low on-resistance (typ. 1Ω) (AQW612S).

3. Applicable for 1 Form A 1 Form B use as well as two independent 1 Form A and 1 Form B use

4. Controls low-level analog signals

PhotoMOS relays feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion

5. Low-level off-state leakage current of max. 1 μA

TYPICAL APPLICATIONS

- Power supply
- Measuring equipment
- Security equipment
- Telephone equipment
- Computer input machines
- Industrial robots
- High-speed inspection machines

TYPES

| | Output rating* | | Package | Part No. | | | Packing quantity | |
|----------------|----------------|--------------|----------|--------------------|----------------------------------|----------------------------------|------------------------------|---------------|
| | Load voltage | Load current | | Tube packing style | Tape and reel packing style | | Tube | Tape and reel |
| | | | | | Picked from the 1/2/3/4-pin side | Picked from the 5/6/7/8-pin side | | |
| AC/DC dual use | 60V | 450mA | SOP8-pin | AQW612S | AQW612SX | AQW612SZ | 1 tube contains: 50 pcs. | 1,000 pcs. |
| | 350V | 100mA | | AQW610S | AQW610SX | AQW610SZ | 1 batch contains: 1,000 pcs. | |

* Indicate the peak AC and DC values.
Note: The packing style indicator "X" or "Z" are not marked on the relay.

RATING

1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

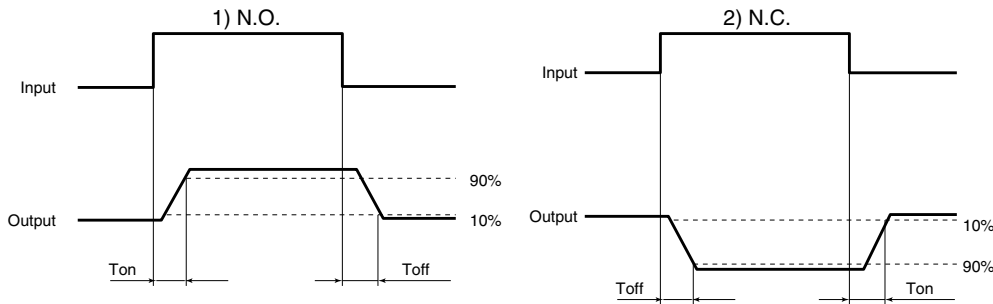
| | Item | Symbol | AQW612S | AQW610S | Remarks |
|-------------------------|-------------------------|-------------------|---------------------------------|----------------|---|
| Input | LED forward current | I _F | 50 mA | | |
| | LED reverse voltage | V _R | 5 V | | |
| | Peak forward current | I _{FP} | 1 A | | f = 100 Hz, Duty factor = 0.1% |
| | Power dissipation | P _{in} | 75 mW | | |
| Output | Load voltage (peak AC) | V _L | 60 V | 350 V | |
| | Continuous load current | I _L | 0.45 A (0.55 A) | 0.1 A (0.13 A) | Peak AC, DC (): in case of using only 1a or 1b, 1 channel |
| | Peak load current | I _{peak} | 1.5 A | 0.3 A | 100 ms (1 shot), V _L = DC |
| | Power dissipation | P _{out} | 600 mW | | |
| Total power dissipation | | P _T | 650 mW | | |
| I/O isolation voltage | | V _{iso} | 1,500 V AC | | |
| Temperature limits | Operating | T _{opr} | -40°C to +85°C -40°F to +185°F | | Non-condensing at low temperatures |
| | Storage | T _{stg} | -40°C to +100°C -40°F to +212°F | | |

GU SOP Form A & B (AQW610S)

2. Electrical characteristics (Ambient temperature: 25°C 77°F)

| Item | | | Symbol | AQW612S | AQW610S | Condition |
|----------------------------------|---------------------------|------------------|--|-------------------------------|--------------------------------|---|
| Input | LED operate current | Typical | I _{Fon} | 0.9 mA | | I _L = Max. |
| | | Maximum | | 3 mA | | |
| | LED reverse current | Minimum | I _{Foff} | 0.4 mA | | I _L = Max. |
| | | Typical | | 0.8 mA | | |
| LED dropout voltage | Typical | V _F | 1.25 V (1.14 V at I _F = 5 mA) | | I _F = 50 mA | |
| | Maximum | | 1.5 V | | | |
| Output | On resistance | Typical | R _{on} | 1 Ω | 18 Ω | I _F = 5 mA (N.O.) I _F = 0 mA (N.C.) I _L = Max. Within 1 s on time |
| | | Maximum | | 2.5 Ω | 25 Ω | |
| | Off state leakage current | Maximum | I _{Leak} | 1 μA | | I _F = 0 mA (N.O.) I _F = 5 mA (N.C.) V _L = Max. |
| Transfer characteristics | Operate time* | Typical | T _{on} (N.O.) | 0.65 ms (N.O.), 0.9 ms (N.C.) | 0.28 ms (N.O.), 0.52 ms (N.C.) | I _F = 0 mA → 5 mA I _L = Max. |
| | | Maximum | T _{off} (N.C.) | 3.0 ms | 1.0 ms | |
| | Reverse time* | Typical | T _{off} (N.O.) | 0.08 ms (N.O.), 0.2 ms (N.C.) | 0.04 ms (N.O.), 0.23 ms (N.C.) | I _F = 5 mA → 0 mA I _L = Max. |
| | | Maximum | T _{on} (N.C.) | 1.0 ms | 1.0 ms | |
| | I/O capacitance | Typical | C _{iso} | 0.8 pF | | f = 1 MHz |
| | Maximum | | 1.5 pF | | V _B = 0 V | |
| Initial I/O isolation resistance | Minimum | R _{iso} | 1,000 MΩ | | 500 V DC | |

*Operate/Reverse time



RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper relay operation and resetting.

| Item | Symbol | Recommended value | Unit |
|-------------------|----------------|-------------------|------|
| Input LED current | I _F | 5 | mA |

■ For Dimensions.

■ For Schematic and Wiring Diagrams.

■ For Cautions for Use.

■ These products are not designed for automotive use.

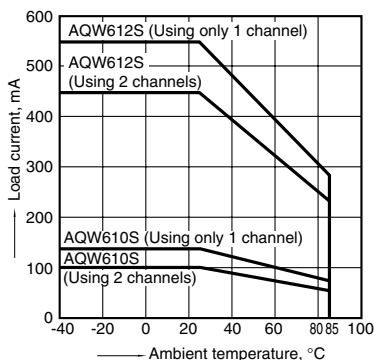
If you are considering to use these products for automotive applications, please contact your local Panasonic Electric Works technical representative.

For more information.

REFERENCE DATA

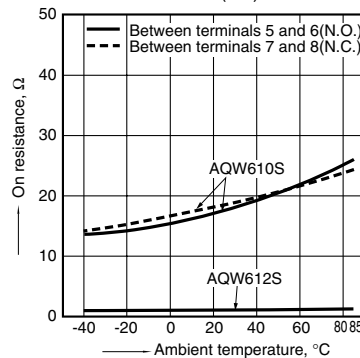
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F



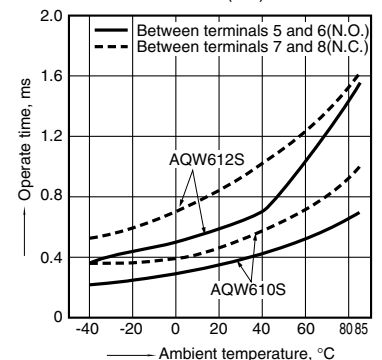
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8; LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



3. Operate time vs. ambient temperature characteristics

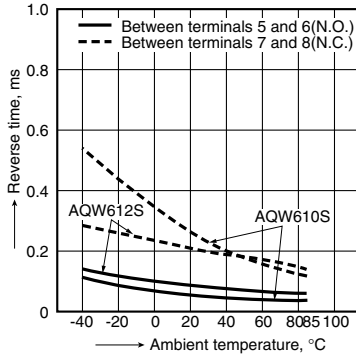
LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



GU SOP Form A & B (AQW610S)

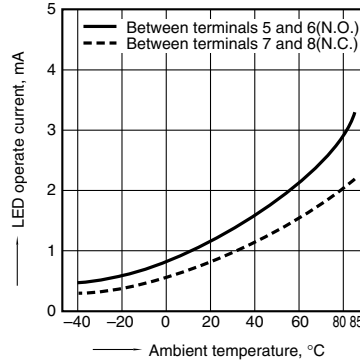
4. Reverse time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



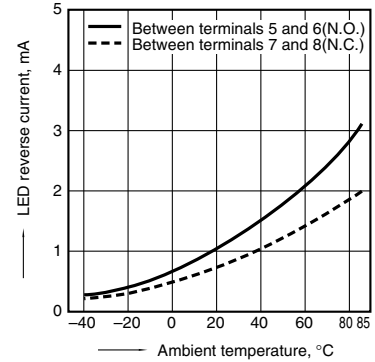
5. LED operate current vs. ambient temperature characteristics

Load voltage: Max. (DC);
Continuous load current: Max. (DC)



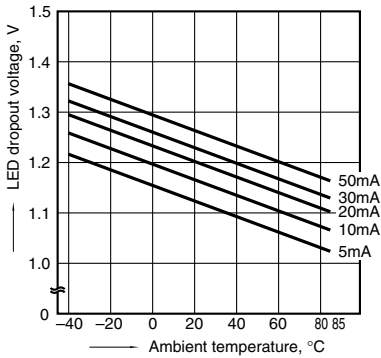
6. LED reverse current vs. ambient temperature characteristics

Load voltage: Max. (DC);
Continuous load current: Max. (DC)



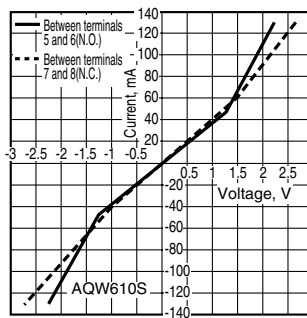
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



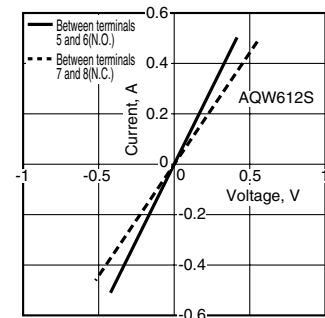
8-(1). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



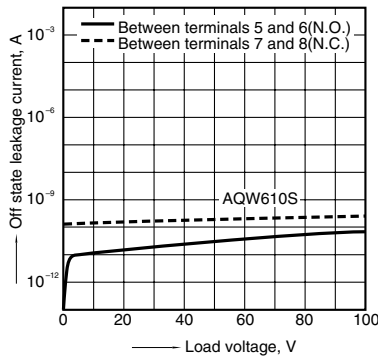
8-(2). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



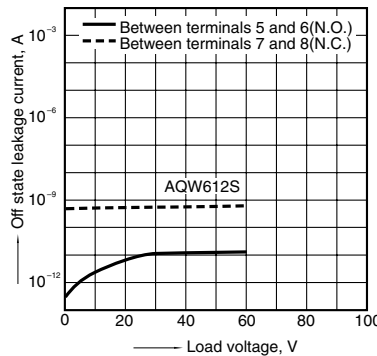
9-(1). Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



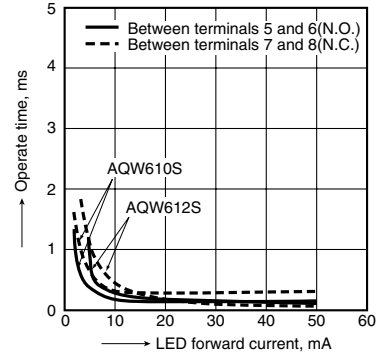
9-(2). Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



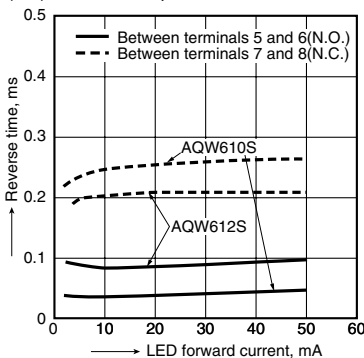
10. Operate time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Load voltage: Max. (DC); Continuous load current:
Max. (DC); Ambient temperature: 25°C 77°F



11. Reverse time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Load voltage: Max. (DC); Continuous load current:
Max. (DC); Ambient temperature: 25°C 77°F



12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Frequency: 1 MHz;
Ambient temperature: 25°C 77°F

