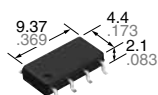
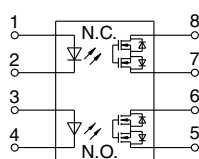


Both N.O. and N.C. contacts incorporated in a small SOP8-pin package

PhotoMOS®
GU SOP 1 Form A & 1 Form B
(AQW610S)



mm inch



RoHS compliant

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 and 1 Form B use as well as two independent 1 Form A and 1 Form B use

4. Controls low-level analog signals

PhotoMOS 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

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 batch contains: 1,000 pcs. | 1,000 pcs. |
| | 350V | 100mA | | AQW610S | AQW610SX | AQW610SZ | | |

* Indicate the peak AC and DC values.

Note: The packing style indicator "X" or "Z" are not marked on the device.

RATING

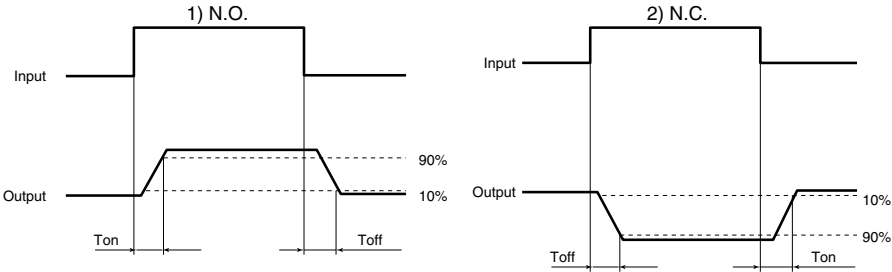
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

| 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 Vrms | | |
| Ambient temperature | Operating | T _{opr} | -40 to +85°C -40 to +185°F | | (Non-icing at low temperatures) |
| | Storage | T _{stg} | -40 to +100°C -40 to +212°F | | |

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

| Item | | | Symbol | AQW612S | AQW610S | Condition |
|----------------------------------|---------------------------|------------------|--------------------------|--|--------------------------------|---|
| Input | LED operate current | Typical | I _{Fon} (N.O.) | 0.9 mA | | I _L = Max. |
| | | Maximum | I _{Foff} (N.C.) | 3 mA | | |
| | LED reverse current | Minimum | I _{Foff} (N.O.) | 0.4 mA | | I _L = Max. |
| | | Typical | I _{Fon} (N.C.) | 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.) |
| | | Maximum | | 2.5 Ω | 25 Ω | I _L = Max. Within 1 s |
| | 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.) |
| 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



3. Recommended operating conditions (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

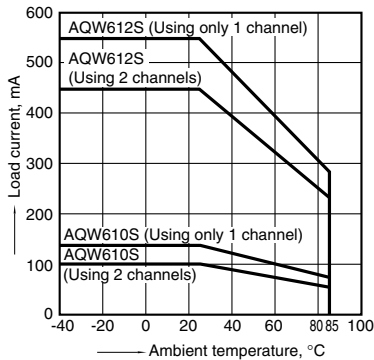
| Item | | Symbol | Number of used channels | Min. | Max. | Unit |
|---------|-------------------------|----------------|-------------------------|------|--------------|------|
| AQW612S | LED current | I _F | | 5 | 30 | mA |
| | Load voltage (Peak AC) | V _L | | — | 48 | V |
| | Continuous load current | I _L | | — | 0.55 0.45 | A |
| AQW610S | Load voltage (Peak AC) | V _L | | — | 280 | V |
| | Continuous load current | I _L | | — | 0.13 0.1 | A |

■ These products are not designed for automotive use.
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

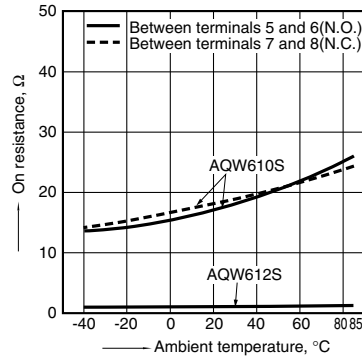
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40 to $+85^{\circ}\text{C}$
 -40 to $+185^{\circ}\text{F}$



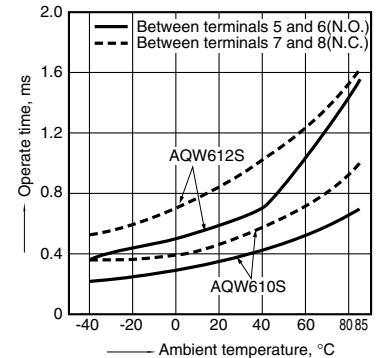
2. On resistance vs. ambient temperature characteristics

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



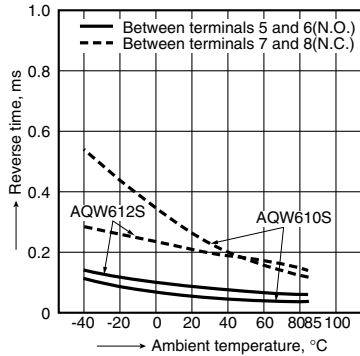
3. Operate time vs. ambient temperature characteristics

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



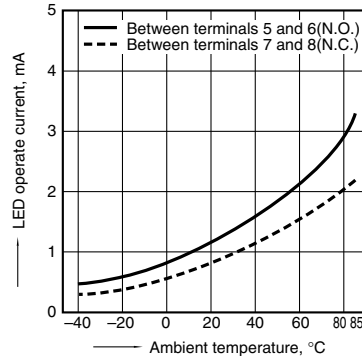
4. Reverse time vs. ambient temperature characteristics

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



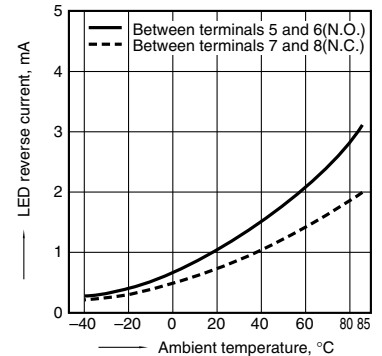
5. LED operate current vs. ambient temperature characteristics

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



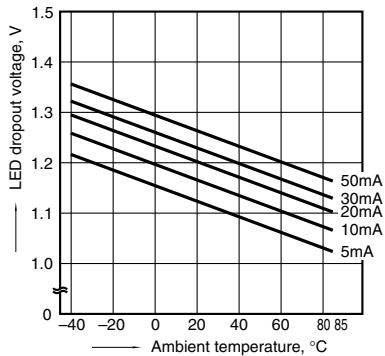
6. LED reverse current vs. ambient temperature characteristics

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



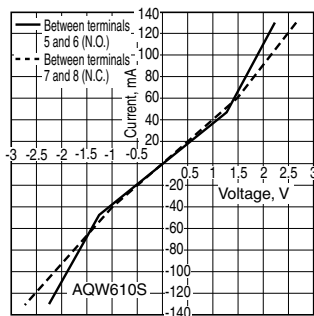
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



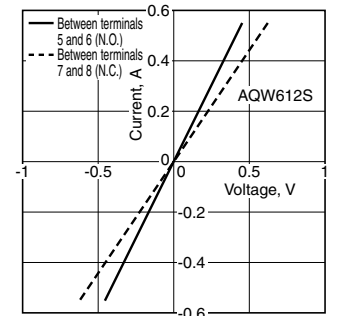
8-(1). Current vs. voltage characteristics of output at MOS portion

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



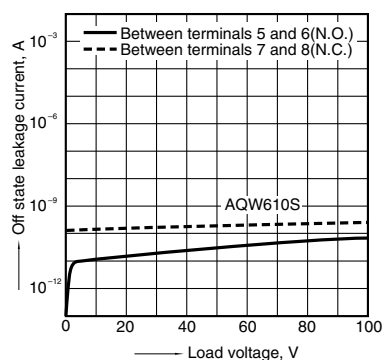
8-(2). Current vs. voltage characteristics of output at MOS portion

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



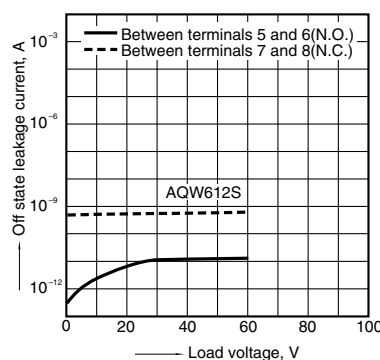
9-(1). Off state leakage current vs. load voltage characteristics

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



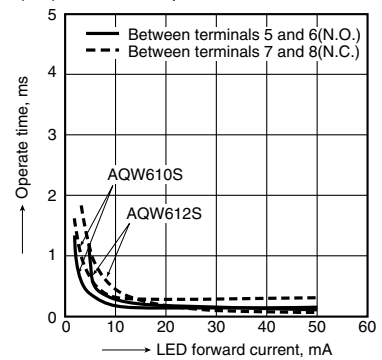
9-(2). Off state leakage current vs. load voltage characteristics

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



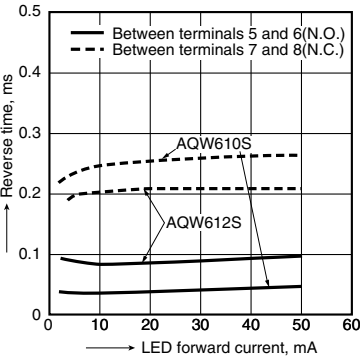
10. Operate time vs. LED forward current characteristics

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



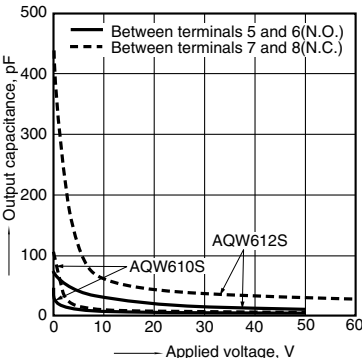
11. Reverse time vs. LED forward current characteristics

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;
LED current: 0 mA (N.O.), 5 mA (N.C.); Frequency:
1 MHz; Ambient temperature: 25°C 77°F



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