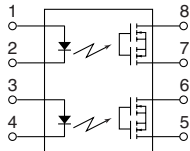


mm inch



RoHS compliant

## FEATURES

### 1. 2 channels in miniature SOP8-pin design

The device comes in a super-miniature SO package 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 DIP8-pin type.

### 2. Controls low-level analog signals

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

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

## TYPICAL APPLICATIONS

- Measuring instruments
- Data communications
- Computers
- 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            | 400mA        | SOP8-pin | AQW212S            | AQW212SX                         | AQW212SZ                         | 1 tube contains:<br>50 pcs.<br>1 batch contains:<br>1,000 pcs. | 1,000 pcs.    |
|                | 350V           | 100mA        |          | AQW210S            | AQW210SX                         | AQW210SZ                         |  |               |
|                | 400V           | 80mA         |          | AQW214S            | AQW214SX                         | AQW214SZ                         |  |               |

\* 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)

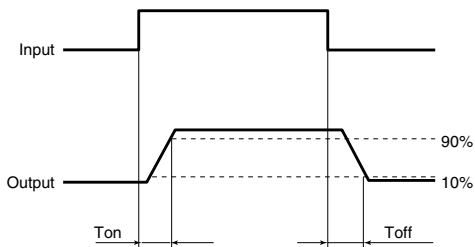
| Item                    | Symbol                  | AQW212S    | AQW210S                         | AQW214S        | Remarks                            |   |
|-------------------------|-------------------------|------------|---------------------------------|----------------|------------------------------------|---|
| Input                   | LED forward current     | $I_F$      | 50 mA                           |                |                                    |   |
|                         | LED reverse voltage     | $V_R$      | 5 V                             |                |                                    |   |
|                         | Peak forward current    | $I_{FP}$   | 1 A                             |                |                                    | $f = 100 \text{ Hz}$ , Duty factor = 0.1%           |
|                         | Power dissipation       | $P_{in}$   | 75 mW                           |                |                                    |   |
| Output                  | Load voltage (peak AC)  | $V_L$      | 60 V                            | 350 V          | 400 V                              |   |
|                         | Continuous load current | $I_L$      | 0.4 A (0.5 A)                   | 0.1 A (0.13 A) | 0.08 A (0.1 A)                     | Peak AC, DC<br>( ): in case of using only 1 channel |
|                         | Peak load current       | $I_{peak}$ | 1.5 A                           | 0.3 A          | 0.24 A                             | A connection: 100 ms (1 shot), $V_L = \text{DC}$    |
|                         | 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 2 Form A (AQW210S)

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

| Item                             |                           | Symbol                                   | AQW212S | AQW210S | AQW214S                | Remarks  |
|----------------------------------|---------------------------|--|---------|---------|------------------------|--|
| Input                            | LED operate current       | Typical                                  | 0.9 mA  |         |                        | I <sub>L</sub> = Max.  |
|                                  |                           | Maximum                                  | 3 mA    |         |                        |  |
|                                  | LED turn off current      | Minimum                                  | 0.4 mA  |         |                        | I <sub>L</sub> = Max.  |
|                                  |                           | Typical                                  | 0.8 mA  |         |                        |  |
| LED dropout voltage              | Typical                   | 1.25 V (1.14 V at I <sub>F</sub> = 5 mA) |         |         | I <sub>F</sub> = 50 mA |  |
|                                  | Maximum                   | 1.5 V                                    |         |         |                        |  |
| Output                           | On resistance             | Typical                                  | 0.83 Ω  | 16 Ω    | 30 Ω                   | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = Max.<br>Within 1 s on time |
|                                  |                           | Maximum                                  | 2.5 Ω   | 35 Ω    | 50 Ω                   |  |
|                                  | Off state leakage current | Maximum                                  | 1 μA    |         |                        | I <sub>F</sub> = 0 mA<br>V <sub>L</sub> = Max.                       |
| Transfer characteristics         | Turn on time*             | Typical                                  | 0.65 ms | 0.23 ms | 0.21 ms                | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = Max.                       |
|                                  |                           | Maximum                                  | 2 ms    |         |                        |  |
|                                  | Turn off time*            | Typical                                  | 0.08 ms | 0.04 ms |                        | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = Max.                       |
|                                  |                           | Maximum                                  | 0.2 ms  |         |                        |  |
|                                  | I/O capacitance           | Typical                                  | 0.8 pF  |         |                        | f = 1 MHz<br>V <sub>B</sub> = 0 V                                    |
|                                  |                           | Maximum                                  | 1.5 pF  |         |                        |  |
| Initial I/O isolation resistance | Minimum                   | 1,000 MΩ                                 |         |         | 500 V DC               |  |

\*Turn on/ Turn off time



## RECOMMENDED OPERATING CONDITIONS

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

| Item              | Symbol         | Recommended value | Unit |
|-------------------|----------------|-------------------|------|
| Input LED current | I <sub>F</sub> | 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 Corporation technical representative.

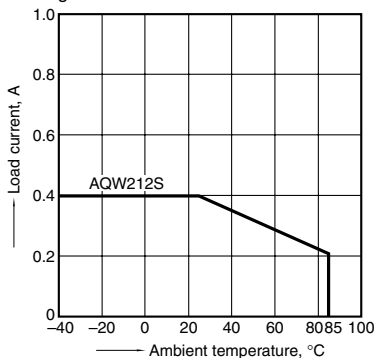
For more information.

## REFERENCE DATA

1.- (1) Load current vs. ambient temperature characteristics

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

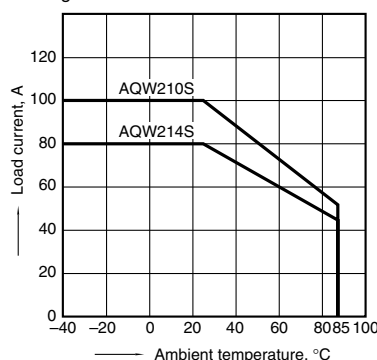
When using 2 channels



1.- (2) Load current vs. ambient temperature characteristics

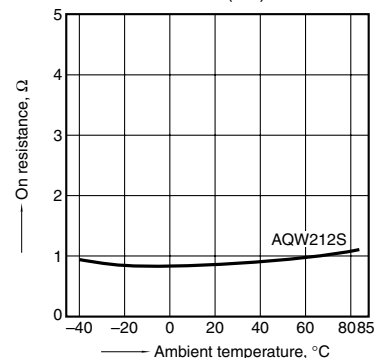
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F

When using 2 channels



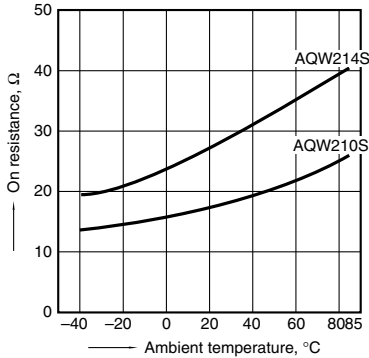
2.- (1) On resistance vs. ambient temperature characteristics

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



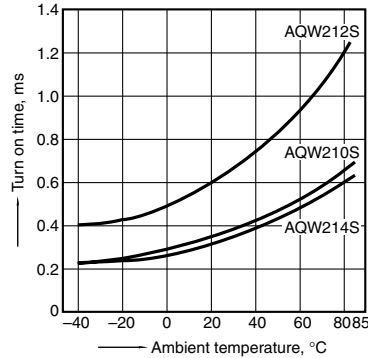
## 2.-(2) On resistance vs. ambient temperature characteristics

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



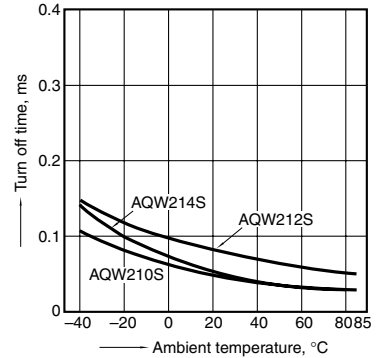
## 3. Turn on time vs. ambient temperature characteristics

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



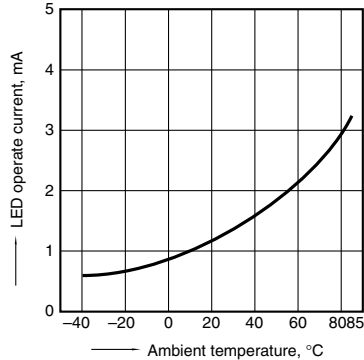
## 4. Turn off time vs. ambient temperature characteristics

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



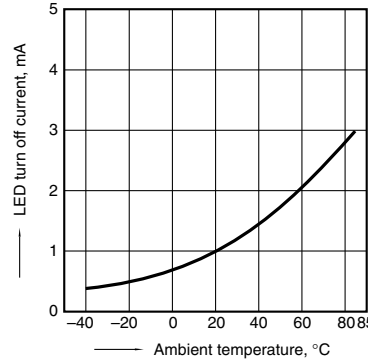
## 5. LED operate current vs. ambient temperature characteristics

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



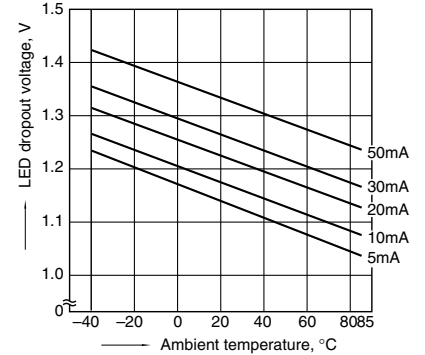
## 6. LED turn off current vs. ambient temperature characteristics

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



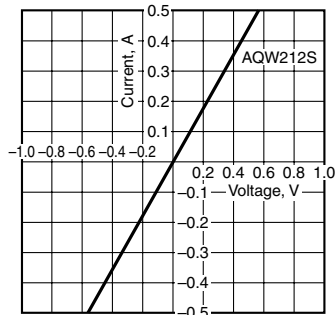
## 7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types;  
LED current: 5 to 50 mA



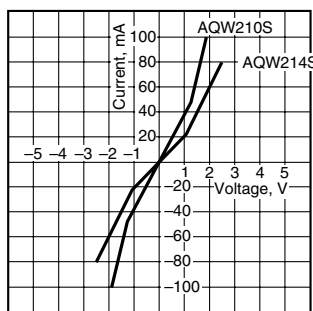
## 8.-(1) Current vs. voltage characteristics of output at MOS portion

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



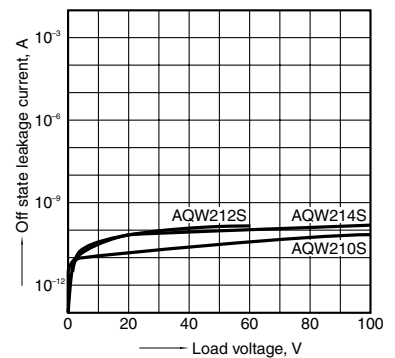
## 8.-(2) Current vs. voltage characteristics of output at MOS portion

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



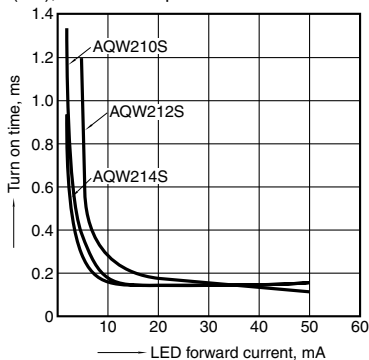
## 9. Off state leakage current vs. load voltage characteristics

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



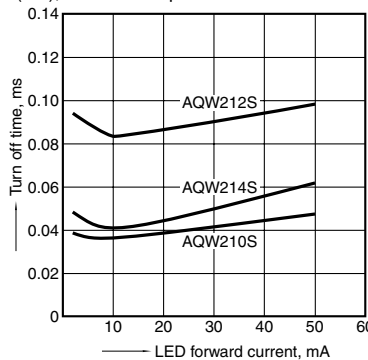
## 10. Turn on time vs. LED forward current characteristics

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



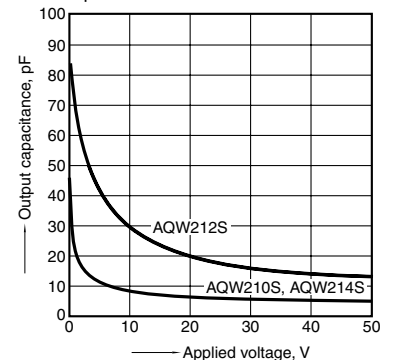
## 11. Turn off time vs. LED forward current characteristics

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



# Mouser Electronics

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- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
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