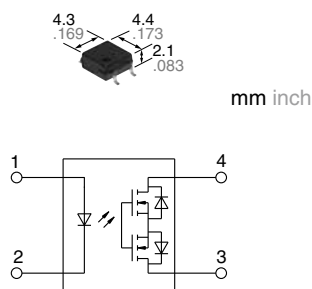




**Miniature SOP4-pin type with high capacity up to 1.6A**

**PhotoMOS®  
GU SOP 1 Form A High Capacity  
(AQY210GS)**



**RoHS compliant**

### FEATURES

1. Continuous load current: Max. 1.6A high capacity (AQY211G2S)
2. Low on resistance: Typ. 0.1 Ω (AQY211G2S)
3. Broad lineup of high capacity types

### TYPICAL APPLICATIONS

- Measuring instruments  
Tester, etc.
- Security and disaster-preventing system  
Use in I/O for alarm and security devices, etc.

### 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-pin side | Picked from the 3/4-pin side |   |               |
| AC/DC dual use | 40V            | 1.6A         | SOP4-pin | AQY211G2S          | AQY211G2SX                   | AQY211G2SZ                   | 1 tube contains: 100 pcs.<br>1 batch contains: 2,000 pcs. | 1,000 pcs.    |
|                | 60V            | 1.25A        |          | AQY212G2S          | AQY212G2SX                   | AQY212G2SZ                   |   |               |
|                |                | 1.0A         |          | AQY212GS           | AQY212GSX                    | AQY212GSZ                    |   |               |

\* Indicate the peak AC and DC values.

Note: For space reasons, the three initial letters of the part number "AQY", the surface mount terminal shape indicator "S" and the packing style indicator "X" or "Z" are not marked on the device. (Ex. the label for product number AQY212G2SX is 212G2.)

### RATING

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

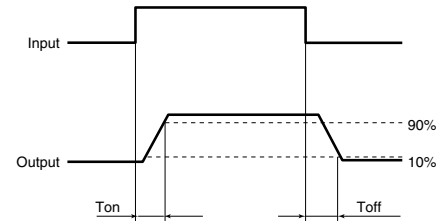
| Item                    |                         | Symbol     | AQY211G2S                   | AQY212G2S | AQY212GS | Remarks                         |
|-------------------------|-------------------------|------------|-----------------------------|-----------|----------|---------------------------------|
| 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)  | $V_L$      | 40 V                        | 60 V      |          |                                 |
|                         | Continuous load current | $I_L$      | 1.6 A                       | 1.25 A    | 1.0 A    | Peak AC, DC                     |
|                         | Peak load current       | $I_{peak}$ | 4 A                         | 3 A       |          | 100ms (1 shot), $V_L = DC$      |
|                         | Power dissipation       | $P_{out}$  | 400 mW                      |           |          |                                 |
| Total power dissipation |                         | $P_T$      | 450 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 |           |          |                                 |

# GU SOP 1 Form A High Capacity (AQY210GS)

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

| Item                             |                           | Symbol           | AQY211G2S                                | AQY212G2S | AQY212GS | Condition   |  |
|----------------------------------|---------------------------|------------------|--|-----------|----------|---|--|
| Input                            | LED operate current       | Typical          | 0.9 mA                                   | 1.1 mA    |          | I <sub>L</sub> = 100mA  |  |
|                                  |                           | Maximum          |  | 3 mA      |          |   |  |
|                                  | LED turn off current      | Minimum          | 0.2 mA                                   | 0.3 mA    |          | I <sub>L</sub> = 100mA  |  |
|                                  |                           | Typical          |  | 0.8 mA    |          |   |  |
| LED dropout voltage              | Typical                   | V <sub>F</sub>   | 1.32 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          | 0.1 Ω                                    | 0.2 Ω     | 0.34 Ω   | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = Max.<br>Within 1 s                          |  |
|                                  |                           | Maximum          | 0.15 Ω                                   | 0.5 Ω     | 0.7 Ω    |   |  |
|                                  | Off state leakage current | Maximum          | I <sub>Leak</sub>                        | 1 μA      |          |   | I <sub>F</sub> = 0 mA<br>V <sub>L</sub> = Max. |
| Transfer characteristics         | Turn on time*             | Typical          | 1.0 ms                                   | 1.3 ms    |          | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = 100 mA<br>V <sub>L</sub> = 10 V             |  |
|                                  |                           | Maximum          | 3.0 ms                                   | 5.0 ms    |          |   |  |
|                                  | Turn off time*            | Typical          | 0.12 ms                                  | 0.1 ms    |          | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = 100 mA<br>V <sub>L</sub> = 10 V             |  |
|                                  |                           | Maximum          | 0.5 ms                                   |           |          |   |  |
|                                  | I/O capacitance           | Typical          | C <sub>iso</sub>                         | 0.8 pF    |          |   | f = 1 MHz<br>V <sub>B</sub> = 0 V              |
|                                  |                           | Maximum          |  | 1.5 pF    |          |   |  |
| Initial I/O isolation resistance | Minimum                   | R <sub>iso</sub> | 1,000 MΩ                                 |           |          | 500 V DC  |  |
| Max. operating frequency         | Maximum                   | —                | 10 cps                                   | 5 cps     | —        | I <sub>F</sub> = 5 mA<br>duty = 50%<br>V <sub>L</sub> = Max.<br>I <sub>L</sub> = Max. |  |

\*Turn on/Turn off time



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

Please use under recommended operating conditions to obtain expected characteristics.

| Item        |                         | Symbol         | Min. | Max. | Unit |
|-------------|-------------------------|----------------|------|------|------|
| LED current |                         | I <sub>F</sub> | 5    | 30   | mA   |
| AQY211G2S   | Load voltage (Peak AC)  | V <sub>L</sub> | —    | 32   | V    |
|             | Continuous load current | I <sub>L</sub> | —    | 1.6  | A    |
| AQY212G2S   | Load voltage (Peak AC)  | V <sub>L</sub> | —    | 48   | V    |
|             | Continuous load current | I <sub>L</sub> | —    | 1.25 | A    |
| AQY212GS    | Load voltage (Peak AC)  | V <sub>L</sub> | —    | 48   | V    |
|             | Continuous load current | I <sub>L</sub> | —    | 1.0  | A    |

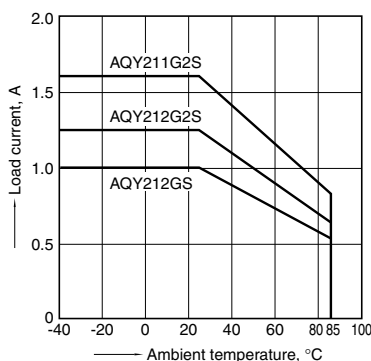
■ These products are not designed for automotive use.

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

## REFERENCE DATA

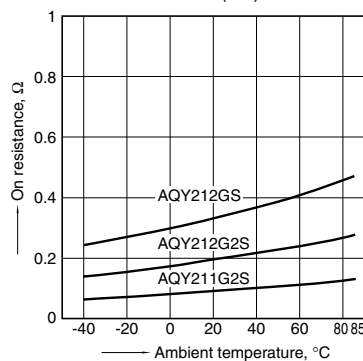
1. Load current vs. ambient temperature characteristics

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



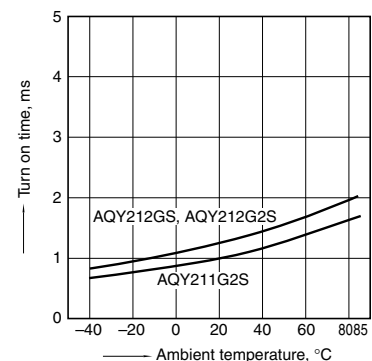
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4;  
LED current: 5 mA; Load voltage: Max. (DC)  
Continuous load current: Max.(DC)



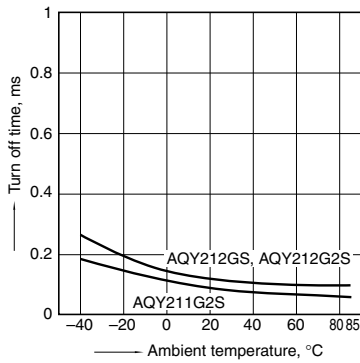
3. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



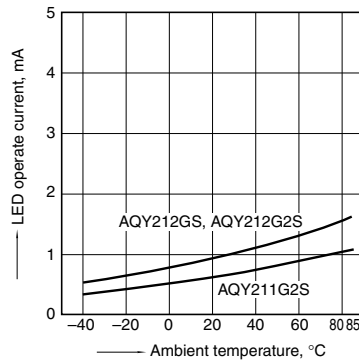
### 4. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



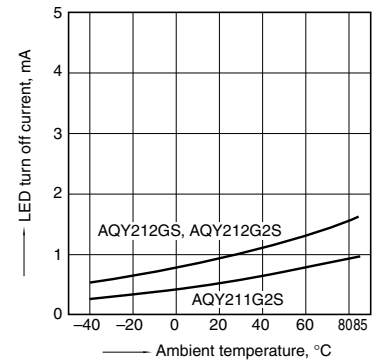
### 5. LED operate current vs. ambient temperature characteristics

Load voltage: 10 V (DC);  
Continuous load current: 100mA (DC)



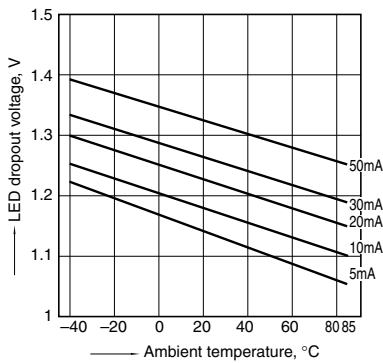
### 6. LED turn off current vs. ambient temperature characteristics

Load voltage: 10 V (DC);  
Continuous load current: 100mA (DC)



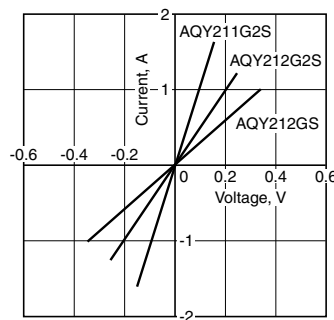
### 7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



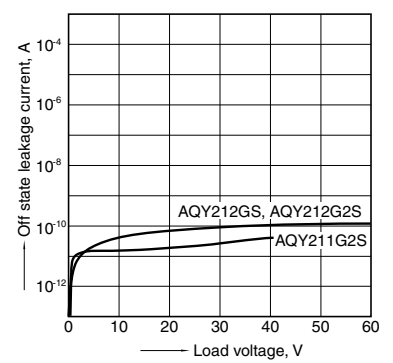
### 8. Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 3 and 4;  
Ambient temperature: 25°C 77°F



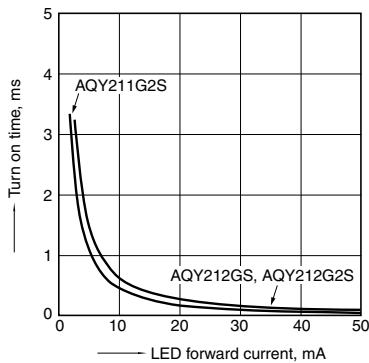
### 9. Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4;  
Ambient temperature: 25°C 77°F



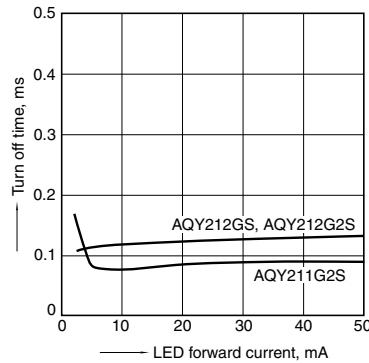
### 10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;  
Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC);  
Ambient temperature: 25°C 77°F



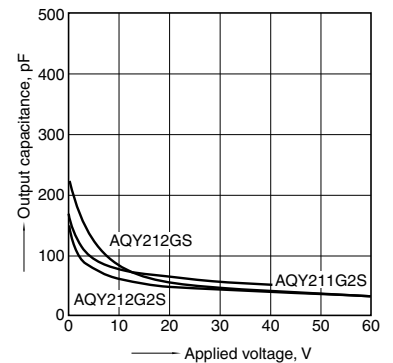
### 11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;  
Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC);  
Ambient temperature: 25°C 77°F



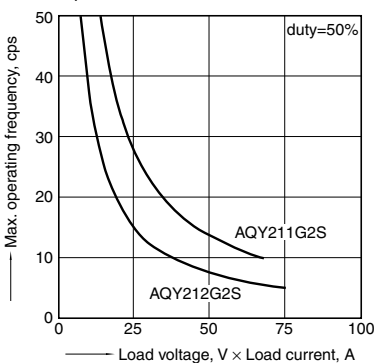
### 12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 3 and 4;  
Frequency: 1 MHz;  
Ambient temperature: 25°C 77°F



### 13. Max. operating frequency vs. load voltage and load current

LED current: 5 mA  
Ambient temperature: 25°C 77°F



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Please contact .....

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