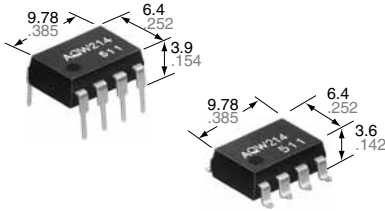
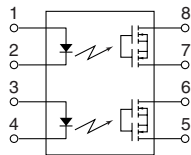


**Compact DIP8-pin type of  
60V to 600V load voltage**

**PhotoMOS<sup>®</sup>  
GU 2 Form A  
(AQW21○)**



mm inch



**RoHS compliant**

## FEATURES

### 1. Compact 8-pin DIP size

The device comes in a compact (W) 6.4 × (L) 9.78 × (H) 3.9 mm (W) .252 × (L) .385 × (H) .154 inch, 8-pin DIP size (through hole terminal type).

### 2. Applicable for 2 Form A use as well as two independent 1 Form A use

### 3. Controls low-level analog signals

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

### 4. High sensitivity and high speed response

Can control max. 0.6 A load current with 5 mA input current. Fast operation speed of typ. 0.65 ms (AQW212).

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

### 6. Wide variation of load voltage 60V to 600V

## TYPICAL APPLICATIONS

- High-speed inspection machines
- Telephones equipment
- Computer

## TYPES

|                | Output rating* |                                  | Package                          | Part No.              |                        |                             |          | Packing quantity                                       |               |
|----------------|----------------|----------------------------------|----------------------------------|-----------------------|------------------------|-----------------------------|----------|--------------------------------------------------------|---------------|
|                |                |                                  |                                  | Through hole terminal | Surface-mount terminal |                             |          |                                                        |               |
|                | 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            | 500 mA                           | DIP8-pin                         | AQW212                | AQW212A                | AQW212AX                    | AQW212AZ | 1 tube contains: 50 pcs.<br>1 batch contains: 500 pcs. | 1,000 pcs.    |
|                | 100 V          | 300 mA                           |                                  | AQW215                | AQW215A                | AQW215AX                    | AQW215AZ |                                                        |               |
|                | 200 V          | 160 mA                           |                                  | AQW217                | AQW217A                | AQW217AX                    | AQW217AZ |                                                        |               |
|                | 350 V          | 120 mA                           |                                  | AQW210                | AQW210A                | AQW210AX                    | AQW210AZ |                                                        |               |
|                | 400 V          | 100 mA                           |                                  | AQW214                | AQW214A                | AQW214AX                    | AQW214AZ |                                                        |               |
|                | 600 V          | 40 mA                            |                                  | AQW216                | AQW216A                | AQW216AX                    | AQW216AZ |                                                        |               |

\*Indicate the peak AC and DC values.

Note: The surface mount terminal shape indicator "A" and the packing style indicator "X" or "Z" are not marked on the device.

## RATING

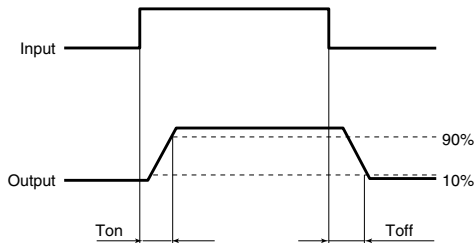
### 1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

| Item                    |                         | Symbol            | AQW212(A)                       | AQW215(A)       | AQW217(A)      | AQW210(A)       | AQW214(A)       | AQW216(A)       | Remarks                                               |
|-------------------------|-------------------------|-------------------|---------------------------------|-----------------|----------------|-----------------|-----------------|-----------------|-------------------------------------------------------|
| Input                   | LED forward current     | I <sub>F</sub>    | 50 mA                           |                 |                |                 |                 |                 |                                                       |
|                         | LED reverse voltage     | V <sub>R</sub>    | 5 V                             |                 |                |                 |                 |                 |                                                       |
|                         | Peak forward current    | I <sub>FP</sub>   | 1 A                             |                 |                |                 |                 |                 | f = 100 Hz,<br>Duty factor = 0.1%                     |
|                         | Power dissipation       | P <sub>in</sub>   | 75 mW                           |                 |                |                 |                 |                 |                                                       |
| Output                  | Load voltage (peak AC)  | V <sub>L</sub>    | 60 V                            | 100 V           | 200 V          | 350 V           | 400 V           | 600 V           |                                                       |
|                         | Continuous load current | I <sub>L</sub>    | 0.50 A (0.60A)                  | 0.30 A (0.35 A) | 0.16 A (0.2 A) | 0.12 A (0.14 A) | 0.10 A (0.13 A) | 0.04 A (0.05 A) | Peak AC, DC<br>( ): in case of using only 1 channel   |
|                         | Peak load current       | I <sub>peak</sub> | 1.0 A                           | 0.9 A           | 0.48 A         | 0.36 A          | 0.3 A           | 0.12 A          | A connection: 100 ms (1 shot),<br>V <sub>L</sub> = DC |
|                         | Power dissipation       | P <sub>out</sub>  | 800 mW                          |                 |                |                 |                 |                 |                                                       |
| Total power dissipation |                         | P <sub>T</sub>    | 850 mW                          |                 |                |                 |                 |                 |                                                       |
| I/O isolation voltage   |                         | V <sub>iso</sub>  | 1,500 V AC                      |                 |                |                 |                 |                 | Between input and output/between contact sets         |
| Temperature limits      | Operating               | T <sub>opr</sub>  | -40°C to +85°C -40°F to +185°F  |                 |                |                 |                 |                 |                                                       |
|                         | Storage                 | T <sub>stg</sub>  | -40°C to +100°C -40°F to +212°F |                 |                |                 |                 |                 | Non-condensing at low temperatures                    |

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

| Item                     |                                  |         | Symbol            | AQW212(A)                                | AQW215(A) | AQW217(A) | AQW210(A) | AQW214(A) | AQW216(A) | Condition                                                            |
|--------------------------|----------------------------------|---------|-------------------|------------------------------------------|-----------|-----------|-----------|-----------|-----------|----------------------------------------------------------------------|
| Input                    | LED operate current              | Typical | I <sub>Fon</sub>  | 0.9 mA                                   |           |           |           |           |           | I <sub>L</sub> = Max.                                                |
|                          |                                  | Maximum |                   | 3 mA                                     |           |           |           |           |           |                                                                      |
|                          | LED turn off current             | Minimum | I <sub>Foff</sub> | 0.4 mA                                   |           |           |           |           |           | I <sub>L</sub> = Max.                                                |
|                          |                                  | Typical |                   | 0.79 mA                                  |           |           |           |           |           |                                                                      |
|                          | LED dropout voltage              | Typical | V <sub>F</sub>    | 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 | R <sub>on</sub>   | 0.83 Ω                                   | 2.3 Ω     | 11 Ω      | 23 Ω      | 30 Ω      | 70 Ω      | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = Max.<br>Within 1 s on time |
|                          |                                  | Maximum |                   | 2.5 Ω                                    | 4.0 Ω     | 15 Ω      | 35 Ω      | 50 Ω      | 120 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 | T <sub>on</sub>   | 0.65 ms                                  | 0.60 ms   | 0.25 ms   | 0.25 ms   | 0.31 ms   | 0.28 ms   | I <sub>F</sub> = 5 mA                                                |
|                          |                                  | Maximum |                   | 2 ms                                     | 2 ms      | 1.0 ms    | 0.5 ms    | 0.5 ms    | 0.5 ms    | I <sub>L</sub> = Max.                                                |
|                          | Turn off time*                   | Typical | T <sub>off</sub>  | 0.08 ms                                  | 0.06 ms   | 0.05 ms   | 0.05 ms   | 0.05 ms   | 0.04 ms   | I <sub>F</sub> = 5 mA                                                |
|                          |                                  | Maximum |                   | 0.2 ms                                   |           |           |           |           |           | I <sub>L</sub> = Max.                                                |
|                          | I/O capacitance                  | Typical | C <sub>iso</sub>  | 0.8 pF                                   |           |           |           |           |           | f = 1 MHz                                                            |
|                          |                                  | Maximum |                   | 1.5 pF                                   |           |           |           |           |           | V <sub>B</sub> = 0 V                                                 |
|                          | Initial I/C isolation resistance | Minimum | R <sub>iso</sub>  | 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 | $I_F$  | 5                 | mA   |

### ■ For Dimensions.

### ■ For Schematic and Wiring Diagrams.

### ■ For Cautions for Use.

### ■ These products are not designed for automotive use.

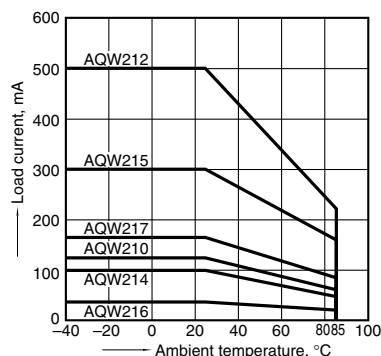
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

For more information.

## REFERENCE DATA

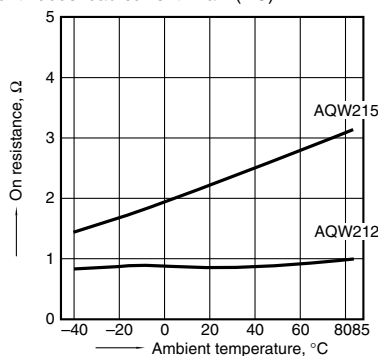
### 1. Load current vs. ambient temperature characteristics

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



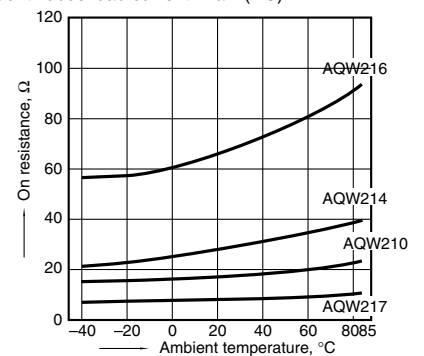
### 2.-(1) On resistance vs. ambient temperature characteristics

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

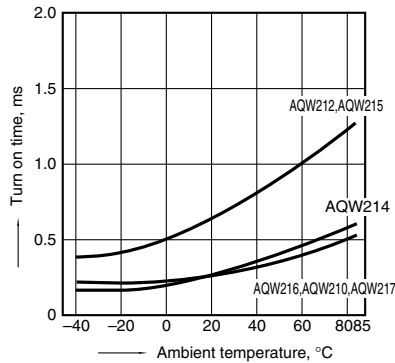
Measured portion: between terminals 5 and 6, 7 and 8;  
LED current: 5 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



# GU 2 Form A (AQW21○)

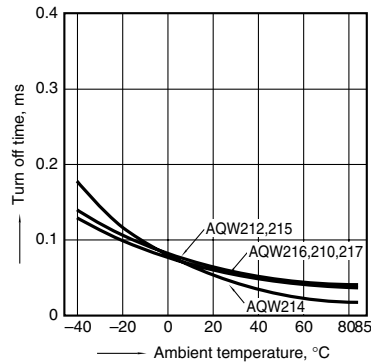
## 3. Turn on time vs. ambient temperature characteristics

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



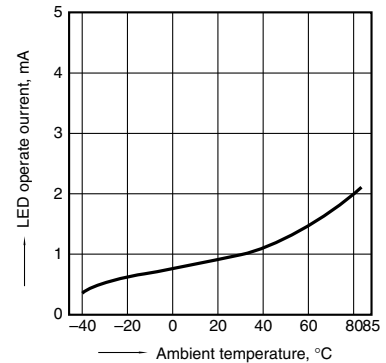
## 4. Turn off time vs. ambient temperature characteristics

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



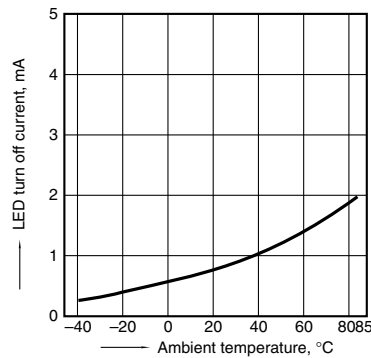
## 5. LED operate current vs. ambient temperature characteristics

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



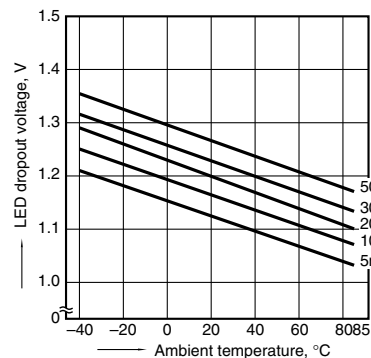
## 6. LED turn off current vs. ambient temperature characteristics

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



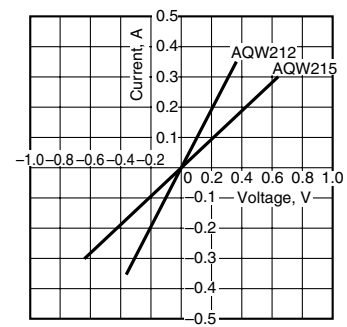
## 7. LED dropout voltage vs. ambient temperature characteristics

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



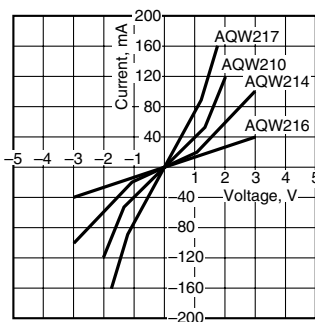
## 8.-(1) Current vs. voltage characteristics of output at MOS portion

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



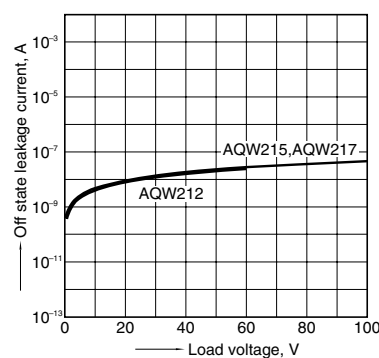
## 8.-(2) Current vs. voltage characteristics of output at MOS portion

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



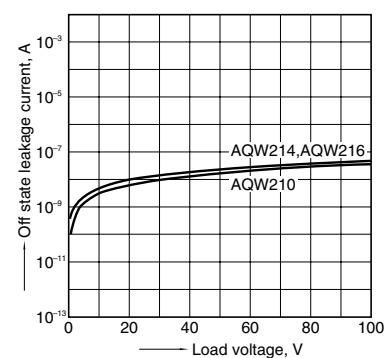
## 9.-(1) Off state leakage current vs. load voltage characteristics

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



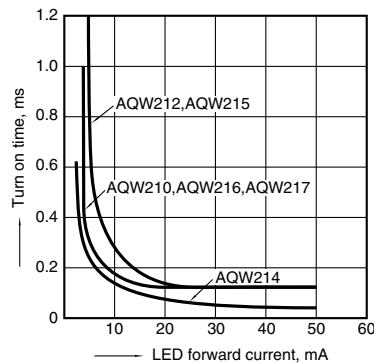
## 9.-(2) Off state leakage current vs. load voltage characteristics

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



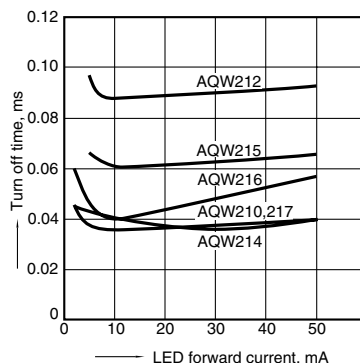
## 10. Turn on time vs. LED forward current characteristics

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



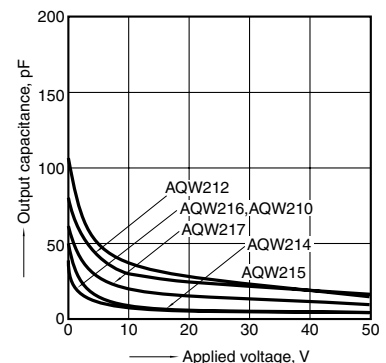
## 11. Turn off time vs. LED forward current characteristics

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





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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