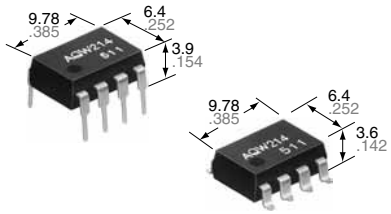
Jameco Part Number 991431

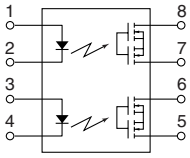
Panasonic
ideas for life

**Compact DIP (2 Form A)
8-pin type.
Controls load voltage
60V to 600V.**

# GU PhotoMOS (AQW21○)




mm inch




**RoHS Directive compatibility information
http://www.mew.co.jp/ac/e/environment/**

## 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 relays feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.
**4. High sensitivity, high speed response**
Can control a maximum 0.13 A load current with a 5 mA input current. Fast operation speed of 310 μs (typical). (AQW214)
**5. Low-level off state leakage current**
The SSR has an off state leakage current of several milliamperes whereas the PhotoMOS relays has typ. 100 pA even with the rated load voltage of 400 V (AQW214).
**6. Low-level thermal electromotive force (Approx. 1 μV)**
**7. Eliminates the need for a counter electromotive force protection diode in the drive circuits on the input side**
**8. Stable ON resistance.**
**9. Eliminates the need for a power supply to drive the power MOSFET**

## TYPICAL APPLICATIONS

- High-speed inspection machines
- Telephones equipment
- Computer

## TYPES

**1. AC/DC type**

| Output rating* | | 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 |
| 60V | 500 mA | AQW212 | AQW212A | AQW212AX | AQW212AZ | 1 tube contains 40 pcs. 1 batch contains 400 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: For space reasons, the SMD terminal shape indicator “A” and the package style indicator “X” or “Z” are not marked on the relay.

## RATING

**1. AC/DC type**

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 | $I_F$ | 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 | 100 V | 200 V | 350 V | 400 V | 600 V | |
| | Continuous load current | $I_L$ | 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) | ( ): in case of using only 1 channel A connection: Peak AC, DC |
| | Peak load current | $I_{peak}$ | 1.0 A | 0.9 A | 0.48 A | 0.36 A | 0.3 A | 0.12 A | A connection: 100 ms (1 shot), $V_L$ = DC |
| | Power dissipation | $P_{out}$ | 800 mW | | | | | | |
| Total power dissipation | | $P_T$ | 850 mW | | | | | | |
| I/O isolation voltage | | $V_{iso}$ | 1,500 V AC | | | | | | Between input and output/ between contact sets |
| 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 | | | | | | |

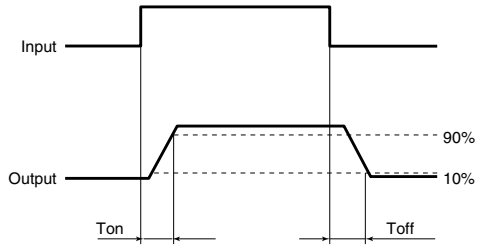
# GU PhotoMOS (AQW21❍)

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 | $I_{Fon}$ | 0.9 mA | | | | | | $I_L$ = Max. |
| | | Maximum | | 3 mA | | | | | | |
| | LED turn off 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 | $R_{on}$ | 0.83 Ω | 2.3 Ω | 11 Ω | 23 Ω | 30 Ω | 70 Ω | $I_F$ = 5 mA<br>$I_L$ = Max.<br>Within 1 son time |
| | | Maximum | | 2.5 Ω | 4.0 Ω | 15 Ω | 35 Ω | 50 Ω | 120 Ω | |
| | Off state leakage current | Maximum | $I_{Leak}$ | 1 μA | | | | | | $I_F$ = 0 mA<br>$V_L$ = Max. |
| Transfer characteristics | Turn on time* | Typical | $T_{on}$ | 0.65 ms | 0.60 ms | 0.25 ms | 0.25 ms | 0.31 ms | 0.28 ms | $I_F$ = 5 mA<br>$I_L$ = Max. |
| | | Maximum | | 2 ms | 2 ms | 1.0 ms | 0.5 ms | 0.5 ms | 0.5 ms | |
| | Turn off time* | Typical | $T_{off}$ | 0.08 ms | 0.06 ms | 0.05 ms | 0.05 ms | 0.05 ms | 0.04 ms | $I_F$ = 5 mA<br>$I_L$ = Max. |
| | | Maximum | | 0.2 ms | | | | | | |
| | I/O capacitance | Typical | $C_{iso}$ | 0.8 pF | | | | | | f = 1 MHz<br>$V_B$ = 0 V |
| | | Maximum | | 1.5 pF | | | | | | |
| | Initial I/C isolation resistance | Minimum | $R_{iso}$ | 1,000 MΩ | | | | | | 500 V DC |

Note: Recommendable LED forward current $I_F$ = 5mA. For type of connection.

*Turn on/Turn off time



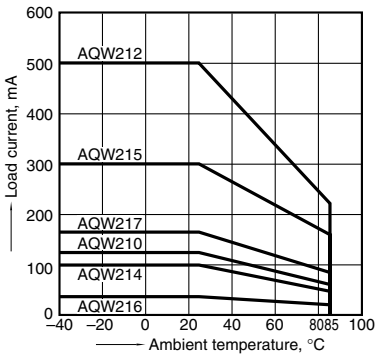


■ **For Dimensions.**
■ **For Schematic and Wiring Diagrams.**
■ **For Cautions for Use.**


## REFERENCE DATA

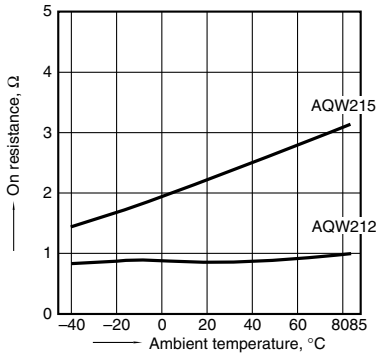
1. Load current vs. ambient temperature characteristics

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



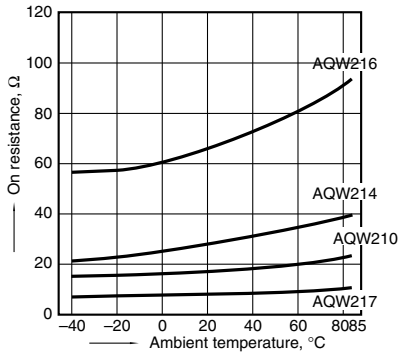

2.-(1) On resistance vs. ambient temperature characteristics

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



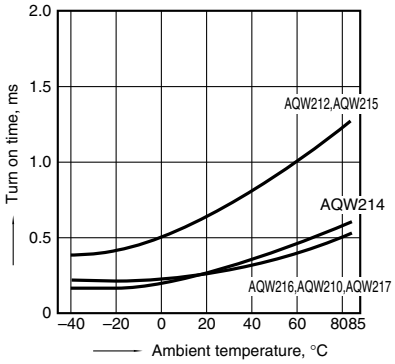

2.-(2) On resistance vs. ambient temperature characteristics

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



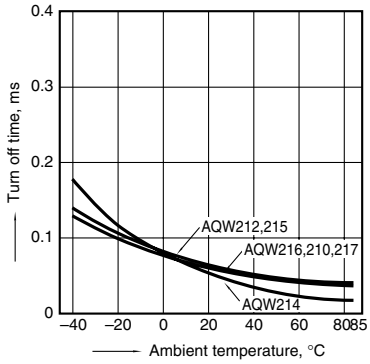
3. Turn on time vs. ambient temperature characteristics

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



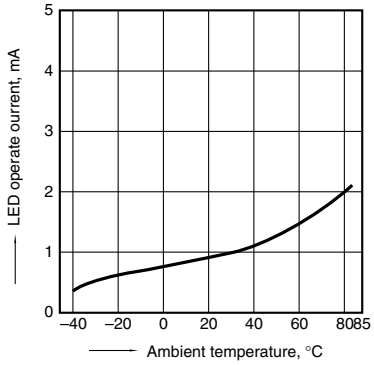

4. Turn off time vs. ambient temperature characteristics

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



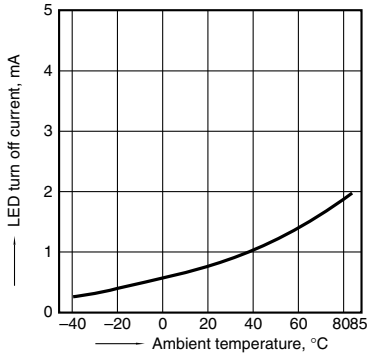

5. LED operate current vs. ambient temperature characteristics

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



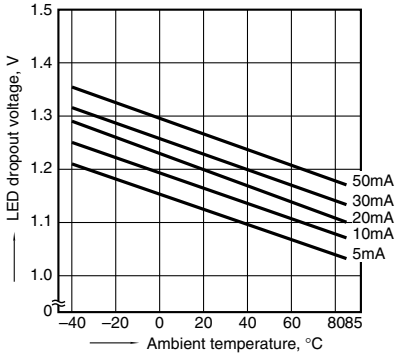

6. LED turn off current vs. ambient temperature characteristics

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



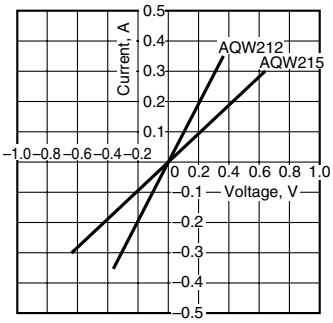

7. LED dropout voltage vs. ambient temperature characteristics

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



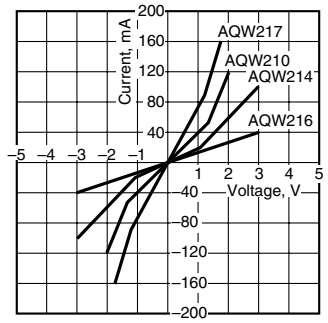

8.-(1) Current vs. voltage characteristics of output at MOS portion

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



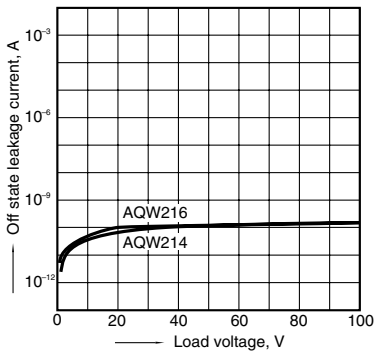

8.-(2) Current vs. voltage characteristics of output at MOS portion

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



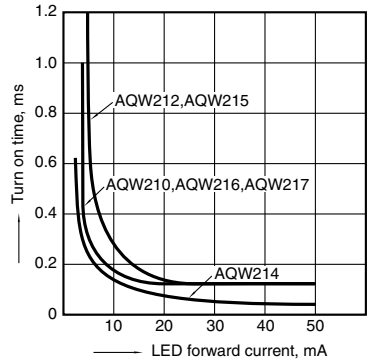

9. Off state leakage current vs. load voltage characteristics

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



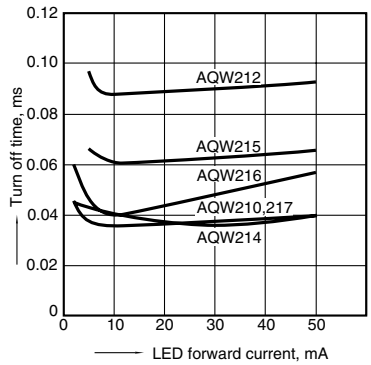

10. Turn on time vs. LED forward current characteristics

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