Panasonic
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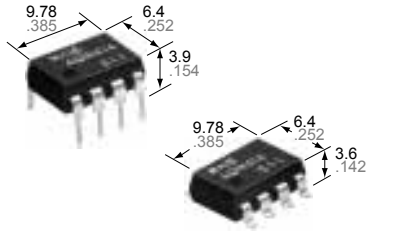
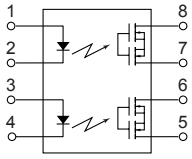
**Compact DIP(2 Form B)**
**8-pin type.**
**Controls load voltage 400V.**

# GU PhotoMOS (AQW414)

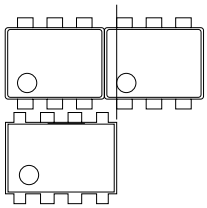



mm inch




## FEATURES

**1. Approx. 1/2 the space compared with the mounting of Two 1 Form B photo MOS units**



Two 1 Form B units

2 Form B type

**2. Applicable for 2 Form B use as well as two independent 1 Form B use**

**3. Low thermal electromotive force (Approx. 1 μV)**

**4. Eliminates the need for a counter electromotive force protection diode in the drive circuits on the input side**

**5. Controls load currents up to 0.13 A with an input current of 5 mA**

**6. High speed switching: operate time typical of 300 μs**

**7. Eliminates the need for a power supply to drive the power MOSFET**

**8. Extremely low closed-circuit offset voltages to enable control of small analog signals without distortion**

**9. Surface-mount model available**

## TYPICAL APPLICATIONS

- High-speed inspection machines
- Telephone equipment
- Computer

## TYPES

| Type | Output rating* | | Part No. | | | | Packing quantity | |
|---|---|---|---|---|---|---|---|---|
| | Load voltage | Load current | Through hole terminal | Surface-mount terminal | | | | |
| | | | Tube packing style | | Tape and reel packing style | | Tube | Tape and reel |
| | | | | | Picked from the 1/2/3-pin side | Picked from the 4/5/6-pin side | | |
| AC/DC type | 400 V | 100 mA | AQW414 | AQW414A | AQW414AX | AQW414AZ | 1 tube contains 40 pcs. 1 batch contains 400 pcs. | 1,000 pcs |

*Indicate the peak AC and DC values.
Note: For space reasons, the SMD terminal shape indicator “A” and the package type indicator “X” and “Z” are omitted from the seal.

## RATINGS

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

| Item | | Symbol | AQW414(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 | $V_L$ | 400 V | |
| | Continuous load current | $I_L$ | 0.1 A (0.13 A) | Peak AC, DC<br>( ): in case of using only 1 channel |
| | Peak load current | $I_{peak}$ | 0.3 A | 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 | |
| Temperature limits | Operating | $T_{opr}$ | –40°C to +85°C –40°F to +185°F | Non-condensing at low temperatures |
| | Storage | $T_{stag}$ | –40°C to +100°C –40°F to +212°F | |

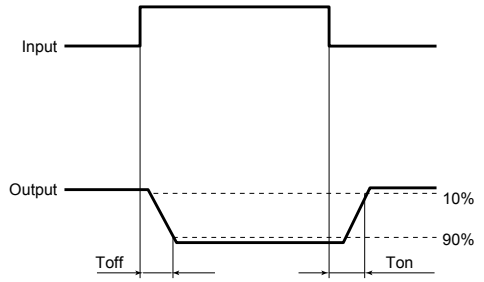
# GU PhotoMOS (AQW414)

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

| Item | | | Symbol | AQW414(A) | Condition |
|---|---|---|---|---|---|
| Input | LED operate (OFF) current | Typical | $I_{Foff}$ | 0.7 mA | $I_L$ = Max. |
| | | Maximum | | 3 mA | |
| | LED reverse (ON) current | Minimum | $I_{Fon}$ | 0.4 mA | $I_L$ = Max. |
| | | Typical | | 0.64 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 | $R_{on}$ | 26 Ω | $I_F$ = 0 mA<br>$I_L$= Max.<br>Within 1 s on time |
| | | Maximum | | 50 Ω | |
| | Off state leakage current | Maximum | $I_{Leak}$ | 1 μA | $I_F$ = 5 mA<br>$V_L$ = 400 V |
| Transfer characteristics | Operate (OFF) time* | Typical | $T_{off}$ | 0.46 ms | $I_F$ = 0 mA → 5 mA<br>$I_L$ = Max. |
| | | Maximum | | 1 ms | |
| | Reverse (ON) time* | Typical | $T_{on}$ | 0.40 ms | $I_F$ = 5 mA → 0 mA<br>$I_L$ = Max. |
| | | Maximum | | 1 ms | |
| | I/O capacitance | Typical | $C_{iso}$ | 0.8 pF | f = 1 MHz<br>$V_B$ = 0 V |
| | | Maximum | | 1.5 pF | |
| | Initial I/O isolation resistance | Minimum | $R_{iso}$ | 1,000 MΩ | 500 V DC |

Note: Recommendable LED forward current $I_F$ = 5 mA.

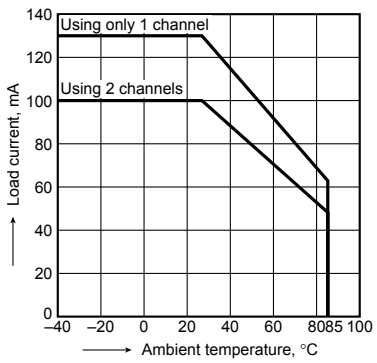
*Operate/Reverse time




## REFERENCE DATA

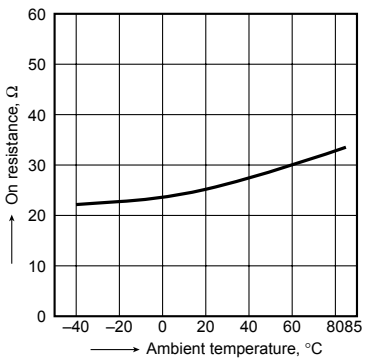
1. Load current vs. ambient temperature characteristics

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



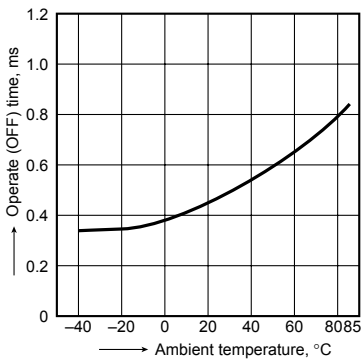

2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
LED current: 0 mA;
Continuous load current: 100 mA (DC)



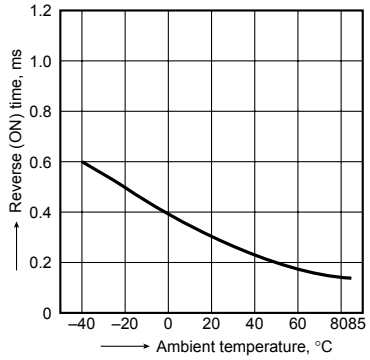

3. Operate (OFF) time vs. ambient temperature characteristics

LED current: 5 mA;
Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC)



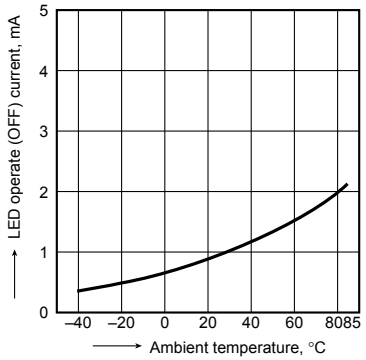
4. Reverse (ON) time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC)



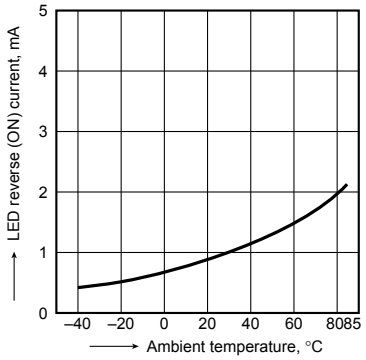

5. LED operate (OFF) current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC)



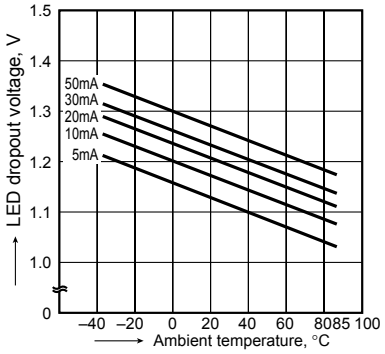

6. LED reverse (ON) current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC)



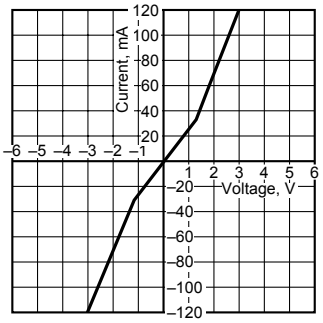

7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



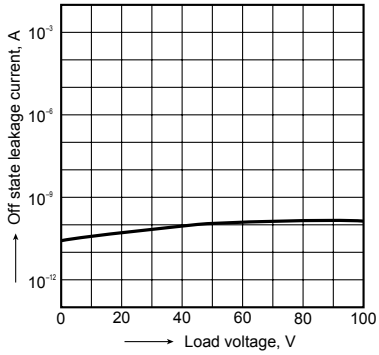

8. Current vs. voltage characteristics of output at MOS portion

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



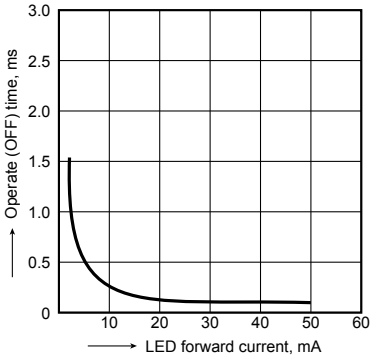

9. Off state leakage current vs. load voltage characteristics

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



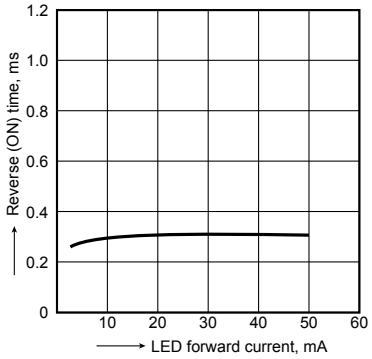

10. Operate (OFF) time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC);
Ambient temperature: 25°C 77°F




11. Reverse (ON) time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Load voltage: 400 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 5 and 6, 7 and 8;
Frequency: 1 MHz;
Ambient temperature: 25°C 77°F