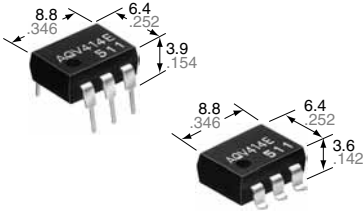
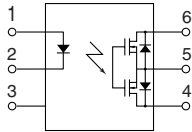


**General use and economy type.
DIP (1 Form B) 6-pin type.
Reinforced insulation
5,000V type.**

**GU-E PhotoMOS
(AQV414E, AQV410EH)**



mm inch



2. This is the low-cost version PhotoMOS 1 Form B output type relay.

Compared to the previous GU PhotoMOS 1 Form B type relay, the attainment of an economical price that is approximately 22% lower will further broaden its market.

3. Normally closed type (2 Form B) is low on-resistance.

(All AQ○4 PhotoMOS are Form B types. And also the Form A types have a low on-resistance.)

This has been realized thanks to the built-in MOSFET processed by our proprietary method, DSD (Double-diffused and Selective Doping) method.

5. High sensitivity, low ON resistance

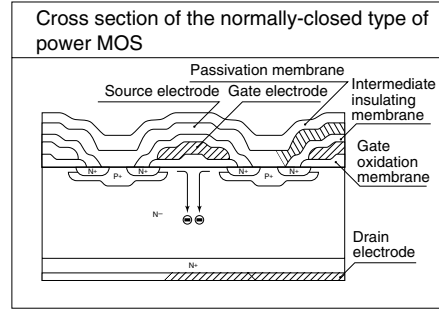
Can control a maximum 0.13 A load current with a 5 mA input current. Low ON resistance of 18 Ω (AQV410EH). Stable operation because there are no metallic contact parts.

6. Low-level off-state leakage current

The SSR has an off-state leakage current of several milliamperes, whereas the PhotoMOS relay has typ. 100 pA even with the rated load voltage of 400 V (AQV414E).

7. Reinforced insulation 5,000 V type also available.

More than 0.4 mm internal insulation distance between inputs and outputs. Conforms to EN41003, EN60950 (reinforced insulation).



4. Controls low-level analog signals

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

TYPICAL APPLICATIONS

- Power supply
- Measuring equipment
- Security equipment
- Telephone equipment
- Sensors

FEATURES

1. 60V type couples high capacity (0.55A) with low on-resistance (1Ω).

| Item | GU-E (1 Form B type) type NEW | |
|-------------------------|---|----------|
| | AQV410EH | AQV412EH |
| Load voltage | 350V | 60V |
| Continuous load current | 0.13A | 0.55A |
| ON resistance (typ.) | 18Ω | 1Ω |

TYPES

| Type | I/O isolation voltage | Output rating* | | Part No. | | | | Packing quantity | |
|------------|-------------------------|----------------|--------|-----------------------|------------------------|------------|-----------------------------|--|---------------|
| | | | | Through hole terminal | Surface-mount terminal | | | Tube | Tape and reel |
| | | | | | Tube packing style | | Tape and reel packing style | | |
| AC/DC type | 1,500 V AC (Standard) | 400 V | 120 mA | AQV414E | AQV414EA | AQV414EAX | AQV414EAZ | 1 tube contains 50 pcs. 1 batch contains 500 pcs. | 1,000 pcs. |
| | | | | AQV412EH | AQV412EHA | AQV412EHAX | AQV412EHAZ | | |
| | 5,000 V AC (Reinforced) | 60 V | 550 mA | AQV410EH | AQV410EHA | AQV410EHAX | AQV410EHAZ | | |
| | | 350 V | 130 mA | AQV414EH | AQV414EHA | AQV414EHAX | AQV414EHAZ | | |

*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.

GU-E PhotoMOS (AQV414E, AQV410EH)

RATING

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

| Item | | Symbol | Type of connection | AQV414E(A) | AQV412EH(A) | AQV410EH(A) | AQV414EH(A) | Remarks |
|-------------------------|-------------------------|------------|--------------------|---------------------------------|-------------|-------------|-------------|---|
| Input | LED forward current | I_F | | 50 mA | | | | f = 100 Hz, Duty factor = 0.1% |
| | LED reverse voltage | V_R | | 5 V | | | | |
| | Peak forward current | I_{FP} | | 1 A | | | | |
| | Power dissipation | P_{in} | | 75 mW | | | | |
| Output | Load voltage (peak AC) | V_L | | 400 V | 60 V | 350 V | 400 V | A connection: Peak AC, DC B,C connection: DC |
| | Continuous load current | I_L | A | 0.12 A | 0.55 A | 0.13 A | 0.12 A | |
| | | | B | 0.13 A | 0.65 A | 0.15 A | 0.13 A | |
| | | | C | 0.15 A | 0.8 A | 0.17 A | 0.15 A | |
| | Peak load current | I_{peak} | | 0.3 A | 1.5 A | 0.4 A | 0.3 A | A connection: 100 ms (1 shot), $V_L = DC$ |
| Power dissipation | P_{out} | | 500 mW | | | | | |
| Total power dissipation | | P_T | | 550 mW | | | | |
| I/O isolation voltage | | V_{iso} | | 1,500 V AC | 5,000 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 | | | | |

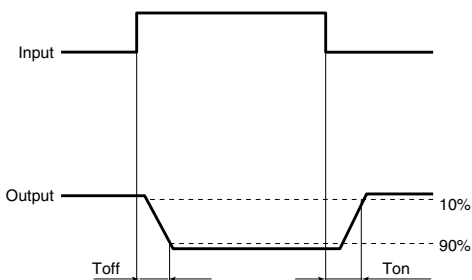
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

| Item | | | Symbol | Type of connection | AQV414E(A) | AQV412EH(A) | AQV410EH(A) | AQV414EH(A) | Condition | |
|----------------------------------|---------------------------|---------------------|------------|--|------------|-------------|-------------|---|---|--|
| Input | LED operate (OFF) current | Typical | I_{Foff} | — | 1.45 mA | 1.9 mA | 1.9 mA | 1.9 mA | $I_L = \text{Max.}$ | |
| | | Maximum | | | 3.0 mA | | | | | |
| | LED reverse (ON) current | Minimum | I_{Fon} | — | 0.3 mA | 0.4 mA | 0.4 mA | 0.4 mA | $I_L = \text{Max.}$ | |
| | | Typical | | | 1.40 mA | 1.8 mA | 1.8 mA | 1.8 mA | | |
| LED dropout voltage | Typical | V_F | — | 1.25 V (1.14 V at $I_F = 5 \text{ mA}$) | | | | $I_F = 50 \text{ mA}$ | | |
| | Maximum | | | 1.5 V | | | | | | |
| Output | On resistance | Typical | R_{on} | A | 26 Ω | 1 Ω | 18 Ω | 25.2 Ω | $I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time | |
| | | Maximum | | | 50 Ω | 2.5 Ω | 35 Ω | 50 Ω | | |
| | | Typical | R_{on} | B | 20 Ω | 0.55 Ω | 13 Ω | 19 Ω | $I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time | |
| | | Maximum | | | 25 Ω | 1.3 Ω | 17.5 Ω | 25 Ω | | |
| | Typical | R_{on} | C | 10 Ω | 0.3 Ω | 6.5 Ω | 10 Ω | $I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time | | |
| | Maximum | | | 12.5 Ω | 0.7 Ω | 8.8 Ω | 12.5 Ω | | | |
| Off state leakage current | Maximum | I_{Leak} | — | 1 μA | 10 μA | 10 μA | 10 μA | $I_F = 5 \text{ mA}$ $V_L = \text{Max.}$ | | |
| Transfer characteristics | Switching speed | Operate (OFF) time* | Typical | T_{off} | — | 0.7 ms | 3 ms | 1.5 ms | 1.3 ms | $I_F = 0 \text{ mA} \rightarrow 5 \text{ mA}$ $I_L = \text{Max.}$ |
| | | | Maximum | | | 2.0 ms | 10 ms | 3.0 ms | 3.0 ms | |
| | | Reverse (ON) time* | Typical | T_{on} | — | 0.1 ms | 0.3 ms | 0.3 ms | 0.3 ms | $I_F = 5 \text{ mA} \rightarrow 0 \text{ mA}$ $I_L = \text{Max.}$ |
| | | | Maximum | | | 1.0 ms | 1.5 ms | 1.5 ms | 1.5 ms | |
| | I/O capacitance | | Typical | C_{iso} | — | 0.8 pF | | | | f = 1 MHz $V_B = 0 \text{ V}$ |
| | | | Maximum | | | 1.5 pF | | | | |
| Initial I/O isolation resistance | | Minimum | R_{iso} | — | 1,000 MΩ | | | | 500 V DC | |

Note: Recommendable LED forward current
Standard type $I_F = 5 \text{ mA}$
Reinforced type $I_F = 5 \text{ to } 10 \text{ mA}$

For type of connection.

*Operate/Reverse time



- For Dimensions.
- For Schematic and Wiring Diagrams.
- For Cautions for Use.