

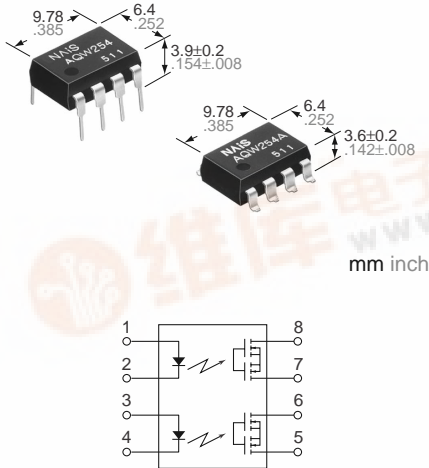


NAIS

**HE (High-function Economy)
Type
[2-Channel (Form A) Type]**

PhotoMOS
RELAYS

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, low ON resistance**
Can control a maximum 0.16 A (AQW254) load current with a 5 mA input current. Low ON resistance of 16 Ω (AQW254). Stable operation because there are no metallic contact parts.
- 5. Low-level off state leakage current**
The SSR has an off state leakage current of several milliamperes, whereas the PhotoMOS relay has only 100 pA even with the rated load voltage of 400 V (AQW254).
- 6. Low thermal electromotive force (Approx. 1 μV)**

TYPICAL APPLICATIONS

- High-speed inspection machines
- Data communication equipment
- Telephone equipment

TYPES

| 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 | |
| AC/DC | 400 V | 120 mA | AQW254 | AQW254A | Picked from the 1/2/3/4-pin side AQW254AX | | | Picked from the 5/6/7/8-pin side AQW254AZ |

*Indicate the peak AC and DC values.

Note: For space reasons, the package type indicator "X" and "Z" are omitted from the seal.

RATING

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

| | Item | Symbol | AQW254(A) | Remarks |
|-------------------------|-------------------------|-------------------|---------------------------------|---|
| Input | LED forward current | I _F | 50 mA | |
| | LED reverse voltage | V _R | 3 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 | 400 V | |
| | Continuous load current | I _L | 0.12 A (0.16 A) | A connection: Peak AC, DC (): in case of using only 1 channel |
| | Peak load current | I _{peak} | 0.36 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 | |



AQW254

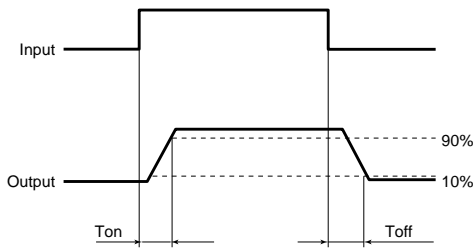
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

| Item | | Symbol | AQW254(A) | Condition | |
|----------------------------------|---------------------------|---|------------------|---|---|
| Input | LED operate current | Typical | 0.9 mA | $I_L = \text{Max.}$ | |
| | | Maximum | 3 mA | | |
| | LED turn off current | Minimum | 0.4 mA | $I_L = \text{Max.}$ | |
| | | Typical | 0.8 mA | | |
| LED dropout voltage | Typical | 1.14 V (1.25 V at $I_F = 50 \text{ mA}$) | | $I_F = 5 \text{ mA}$ | |
| | Maximum | 1.5 V | | | |
| Output | On resistance | Typical | 12.4 Ω | $I_F = 5 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time | |
| | | Maximum | 16 Ω | | |
| | Off state leakage current | Maximum | I_{Leak} | 1 μA | $I_F = 0 \text{ mA}$ $V_L = \text{Max.}$ |
| Transfer characteristics | Switching speed | Turn on time* | Typical | 0.8 ms | $I_F = 5 \text{ mA}$ $I_L = \text{Max.}$ |
| | | | Maximum | 2 ms | |
| | | Turn off time* | Typical | 0.05 ms | $I_F = 5 \text{ mA}$ $I_L = \text{Max.}$ |
| | | | Maximum | 0.2 ms | |
| | I/O capacitance | Typical | C_{iso} | 0.8 pF | $f = 1 \text{ MHz}$ $V_B = 0$ |
| | | Maximum | | 1.5 pF | |
| Initial I/O isolation resistance | Minimum | R_{iso} | 1,000 M Ω | 500 V DC | |

Note: Recommendable LED forward current $I_F = 5 \text{ mA}$.

For type of connection, see page 32.

*Turn on/Turn off time

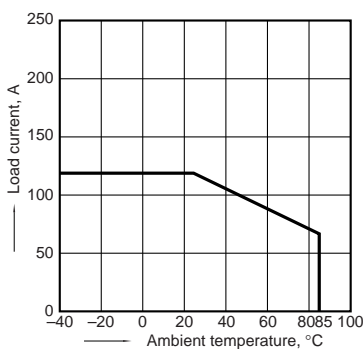


- For Dimensions, see Page 27.
- For Schematic and Wiring Diagrams, see Page 32.
- For Cautions for Use, see Page 36.

REFERENCE DATA

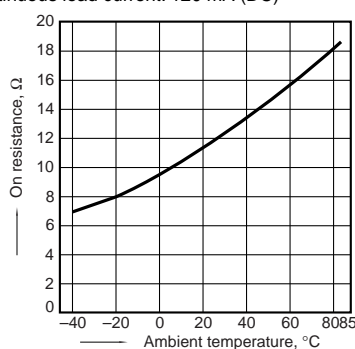
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40°C to $+85^\circ\text{C}$
 -40°F to $+185^\circ\text{F}$



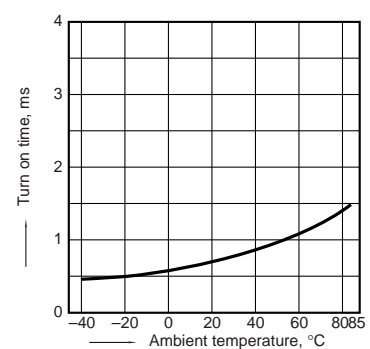
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6,
7 and 8; LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



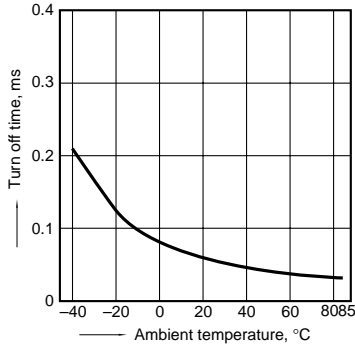
3. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



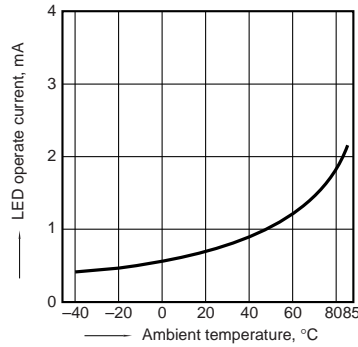
4. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



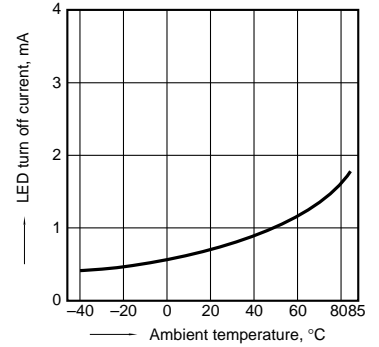
5. LED operate current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



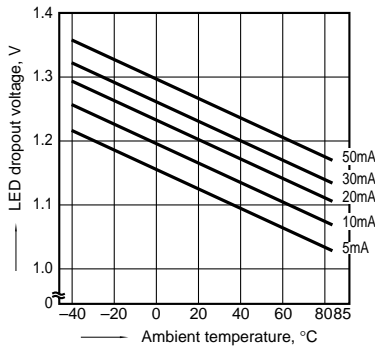
6. LED turn off current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



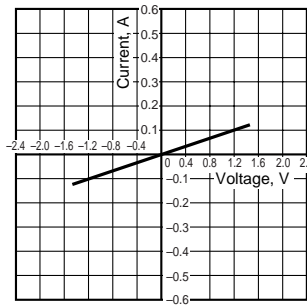
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



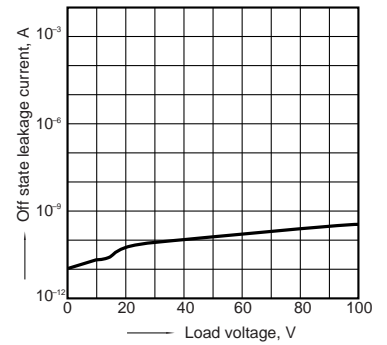
8. Voltage vs. current characteristics of output at MOS portion

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



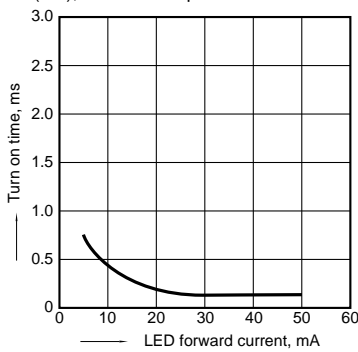
9. Off state leakage current

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



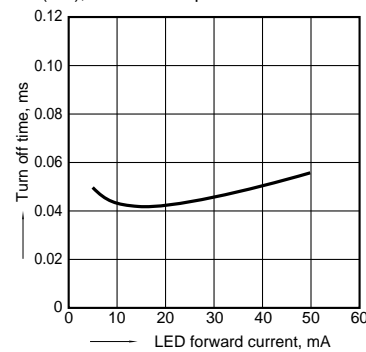
10. LED forward current vs. turn on time characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC); Ambient temperature: 25°C 77°F



11. LED forward current vs. turn off time characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC); Ambient temperature: 25°C 77°F



12. Applied voltage vs. output capacitance characteristics

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

