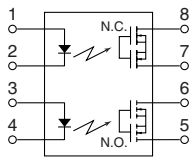
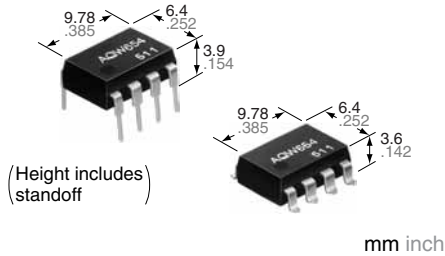


Panasonic

ideas for life

Both 1 Form A and 1 Form B contacts incorporated in a compact DIP8-pin with low on-resistance

PhotoMOS[®]
HE Form A & B
(AQW654)



RoHS compliant

FEATURES

- Applicable for 1 Form A 1 Form B use as well as two independent 1 Form A and 1 Form B use**
- Controls low-level analog signals**
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.
- High sensitivity and low on-resistance**
Can control max. 0.16 A load current with 5 mA input current. Low on-resistance of max. 11 Ω.
- Low-level off state leakage current of max. 1 μA**

TYPICAL APPLICATIONS

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

TYPES

| | Output rating* | | Package | Part No. | | | | Packing quantity | |
|----------------|----------------|--------------|----------|-----------------------|----------------------------------|----------------------------------|----------|--|---------------|
| | | | | Through hole terminal | Surface-mount terminal | | | Tube | Tape and reel |
| | Load voltage | Load current | | | Tube packing style | Tape and reel packing style | | | |
| | | | | | Picked from the 1/2/3/4-pin side | Picked from the 5/6/7/8-pin side | | | |
| AC/DC dual use | 400 V | 120 mA | DIP8-pin | AQW654 | AQW654A | AQW654AX | AQW654AZ | 1 tube contains: 50 pcs. 1 batch contains: 500 pcs. | 1,000 pcs |

*Indicate the peak AC and DC values.
Note: The surface mount terminal 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)

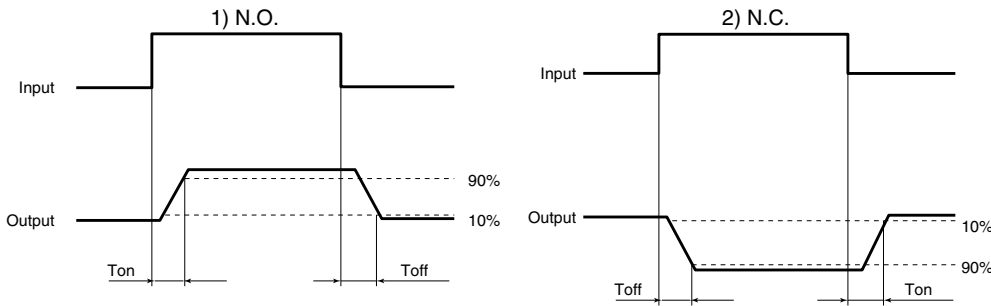
| | Item | Symbol | AQW654(A) | Remarks |
|-------------------------|-------------------------|-------------------|---------------------------------|--|
| Input | LED forward current | I _F | 50 mA | |
| | LED reverse voltage | V _R | 5 V | |
| | Peak forward current | I _{FP} | 1 A | f = 100 Hz, Duty factor = 0.1% |
| | Power dissipation | P _{in} | 75 mW | |
| Output | Load voltage (peak AC) | V _L | 400 V | |
| | Continuous load current | I _L | 0.12A (0.16 A) | 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 | |

HE Form A & B (AQW654)

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

| Item | | Symbol | AQW654(A) | Remarks | |
|----------------------------------|---------------------------|-----------|---------------------------------|--|---|
| Input | LED operate current | Typical | I_{Fon} (N.O.) 0.9 mA | $I_L = \text{Max.}$ | |
| | | Maximum | I_{Foff} (N.C.) 3 mA | | |
| | LED reverse current | Minimum | I_{Foff} (N.O.) 0.4 mA | $I_L = \text{Max.}$ | |
| | | Typical | I_{Fon} (N.C.) 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} | $I_F = 5$ mA (N.O.) $I_F = 0$ mA (N.C.) $I_L = \text{Max.}$ | |
| | | Maximum | 16 Ω | Within 1 s on time | |
| | Off state leakage current | Maximum | I_{Leak} | 1 μ A | $I_F = 0$ mA (N.O.) $I_F = 5$ mA (N.C.) $V_L = \text{Max.}$ |
| Transfer characteristics | Operate time* | Typical | T_{on} (N.O.) | $I_F = 0$ mA \rightarrow 5 mA $I_L = \text{Max.}$ | |
| | | Maximum | T_{off} (N.C.) | | 2 ms |
| | Reverse time* | Typical | T_{off} (N.O.) | 0.04 ms (N.O.) 0.36 ms (N.C.) | $I_F = 5$ mA \rightarrow 0 mA $I_L = \text{Max.}$ |
| | | Maximum | T_{on} (N.C.) | 1 ms | |
| | I/O capacitance | Typical | C_{iso} | 0.8 pF | $f = 1$ MHz |
| | Maximum | 1.5 pF | | $V_B = 0$ V | |
| Initial I/O isolation resistance | Minimum | R_{iso} | 1,000 M Ω | 500 V DC | |

*Operate/Reverse 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.

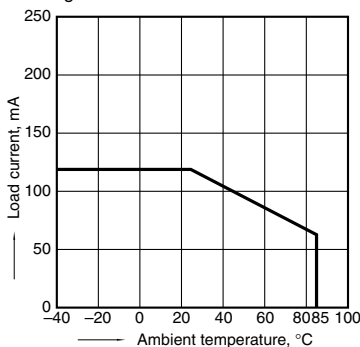
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.
For more information.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

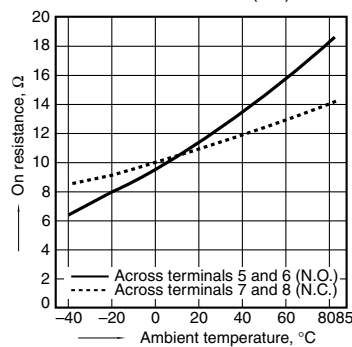
Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F

When using 2 channels



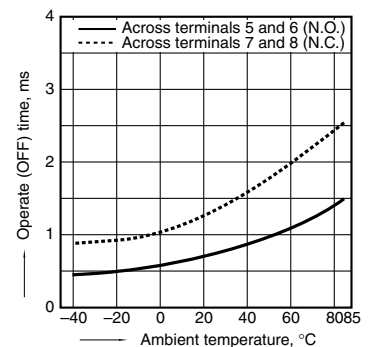
2. On resistance vs. ambient temperature characteristics

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)



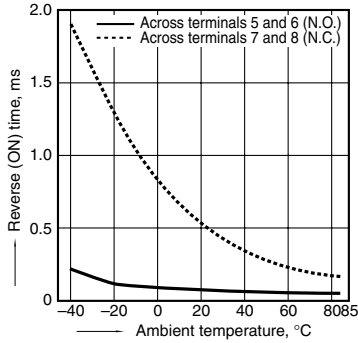
3. Operate time vs. ambient temperature characteristics

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



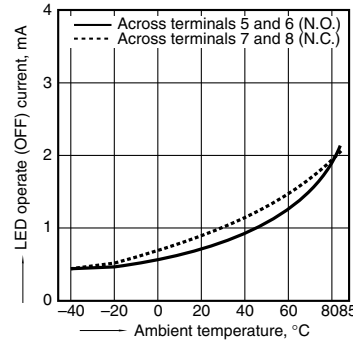
4. Reverse time vs. ambient temperature characteristics

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



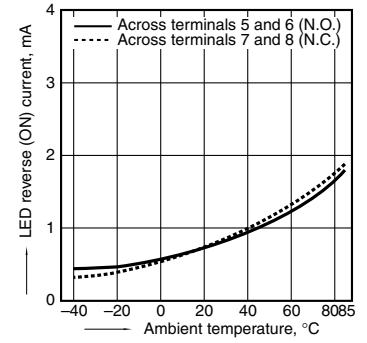
5. LED operate current vs. ambient temperature characteristics

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



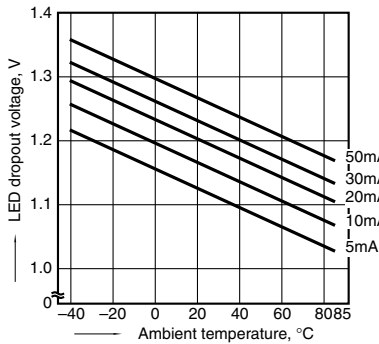
6. LED reverse current vs. ambient temperature characteristics

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



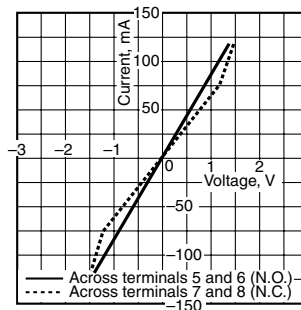
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



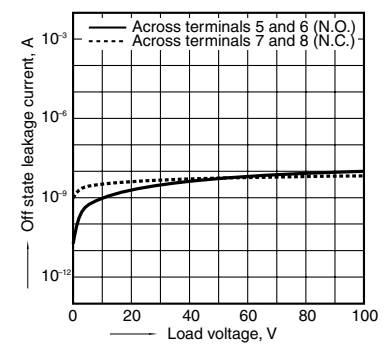
8. Current vs. voltage characteristics of output at MOS portion

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



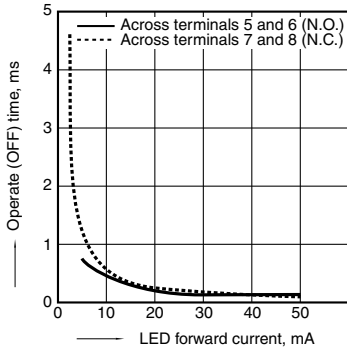
9. Off state leakage current vs. load voltage characteristics

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



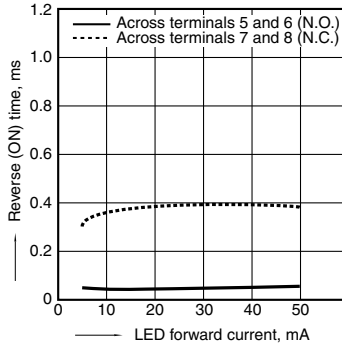
10. Operate time vs. LED forward current characteristics

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



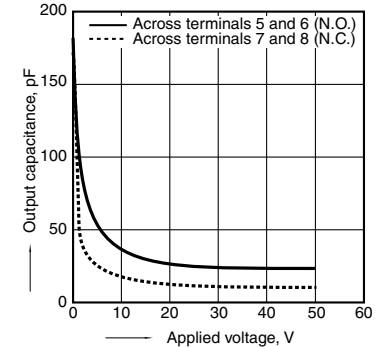
11. Reverse time vs. LED forward current characteristics

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. 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



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