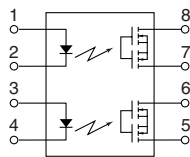
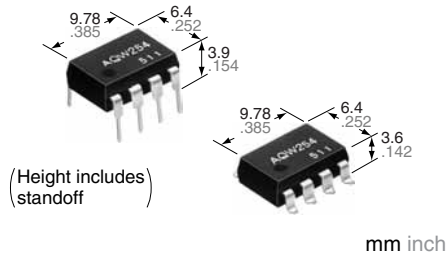


**DIP8-pin type  
featuring low on-resistance  
with 400V load voltage**

**PhotoMOS<sup>®</sup>  
HE 2 Form A  
(AQW254)**



**RoHS compliant**

## FEATURES

### 1. High sensitivity and low on-resistance

Can control max. 0.16 A load current with 5 mA input current. Low on-resistance of typ. 10.2Ω.

### 2. Applicable for 2 Form A use as well as two independent 1 Form A use

### 3. Controls low-level analog signals

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

### 4. Low-level off state leakage current of max. 1 μA

## TYPICAL APPLICATIONS

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

## TYPES

|                | Output rating* |                                  | Package                          | 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 |
|                |                | 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                         | AQW254                | AQW254A                | AQW254AX                    | AQW254AZ | 1 tube contains:<br>50 pcs.<br>1 batch contains:<br>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

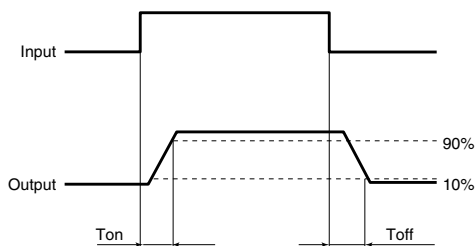
### 1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

| Item                    |                         | Symbol            | AQW254(A)                       | Remarks                                                           |
|-------------------------|-------------------------|-------------------|---------------------------------|-------------------------------------------------------------------|
| Input                   | LED forward current     | I <sub>F</sub>    | 50 mA                           |                                                                   |
|                         | LED reverse voltage     | V <sub>R</sub>    | 5 V                             |                                                                   |
|                         | Peak forward current    | I <sub>FP</sub>   | 1 A                             | f = 100 Hz, Duty factor = 0.1%                                    |
|                         | Power dissipation       | P <sub>in</sub>   | 75 mW                           |                                                                   |
| Output                  | Load voltage (peak AC)  | V <sub>L</sub>    | 400 V                           |                                                                   |
|                         | Continuous load current | I <sub>L</sub>    | 0.12 A (0.16 A)                 | A connection: Peak AC, DC<br>( ): in case of using only 1 channel |
|                         | Peak load current       | I <sub>peak</sub> | 0.36 A                          | A connection: 100 ms (1 shot), V <sub>L</sub> = DC                |
|                         | Power dissipation       | P <sub>out</sub>  | 800 mW                          |                                                                   |
| Total power dissipation |                         | P <sub>T</sub>    | 850 mW                          |                                                                   |
| I/O isolation voltage   |                         | V <sub>iso</sub>  | 1,500 V AC                      | Between input and output/between contact sets                     |
| Temperature limits      | Operating               | T <sub>opr</sub>  | −40°C to +85°C −40°F to +185°F  | Non-condensing at low temperatures                                |
|                         | Storage                 | T <sub>stg</sub>  | −40°C to +100°C −40°F to +212°F |                                                                   |

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

| Item                             |                           |               | Symbol            | AQW254(A)                                | Condition                                                            |
|----------------------------------|---------------------------|---------------|-------------------|------------------------------------------|----------------------------------------------------------------------|
| Input                            | LED operate current       | Typical       | I <sub>Fon</sub>  | 0.9 mA                                   | I <sub>L</sub> = Max.                                                |
|                                  |                           | Maximum       |                   | 3 mA                                     |                                                                      |
|                                  | LED turn off current      | Minimum       | I <sub>Foff</sub> | 0.4 mA                                   | I <sub>L</sub> = Max.                                                |
|                                  |                           | Typical       |                   | 0.8 mA                                   |                                                                      |
|                                  | LED dropout voltage       | Typical       | V <sub>F</sub>    | 1.25 V (1.14 V at I <sub>F</sub> = 5 mA) | I <sub>F</sub> = 50 mA                                               |
|                                  |                           | Maximum       |                   | 1.5 V                                    |                                                                      |
| Output                           | On resistance             | Typical       | R <sub>on</sub>   | 10.2 Ω                                   | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = Max.<br>Within 1 s on time |
|                                  |                           | Maximum       |                   | 16 Ω                                     |                                                                      |
|                                  | Off state leakage current | Maximum       | I <sub>Leak</sub> | 1 μA                                     | I <sub>F</sub> = 0 mA<br>V <sub>L</sub> = Max.                       |
|                                  | Transfer characteristics  | Turn on time* | Typical           | T <sub>on</sub>                          | 0.8 ms                                                               |
| Maximum                          |                           |               | 2 ms              |                                          |                                                                      |
| Turn off time*                   |                           | Typical       | T <sub>off</sub>  | 0.04 ms                                  | I <sub>F</sub> = 5 mA<br>I <sub>L</sub> = Max.                       |
|                                  |                           | Maximum       |                   | 0.2 ms                                   |                                                                      |
| I/O capacitance                  |                           | Typical       | C <sub>iso</sub>  | 0.8 pF                                   | f = 1 MHz<br>V <sub>B</sub> = 0 V                                    |
|                                  |                           | Maximum       |                   | 1.5 pF                                   |                                                                      |
| Initial I/O isolation resistance |                           | Minimum       | R <sub>iso</sub>  | 1,000 MΩ                                 | 500 V DC                                                             |

\*Turn on/Turn off 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.

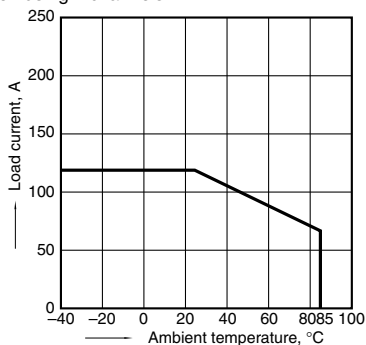
For more information.

## REFERENCE DATA

## 1. Load current vs. ambient temperature characteristics

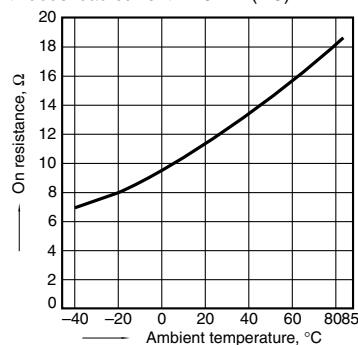
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F

When using 2 channels



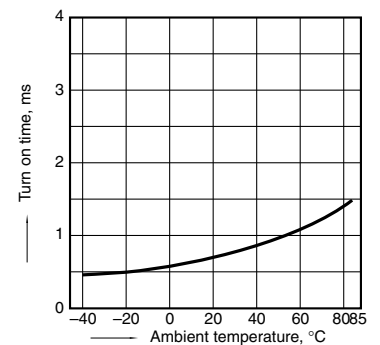
## 2. On resistance vs. ambient temperature characteristics

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. Turn on time vs. ambient temperature characteristics

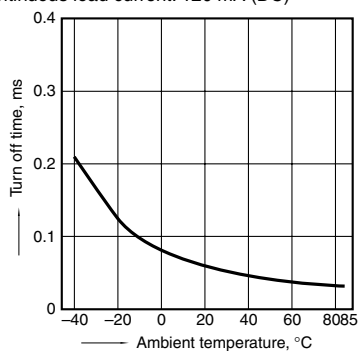
LED current: 5 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



# HE 2 Form A (AQW254)

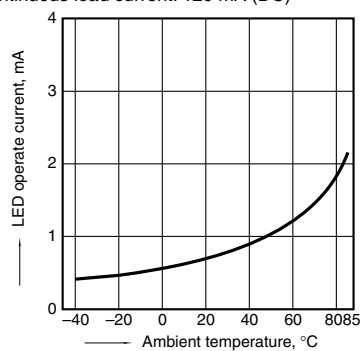
## 4. Turn off time vs. ambient temperature characteristics

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



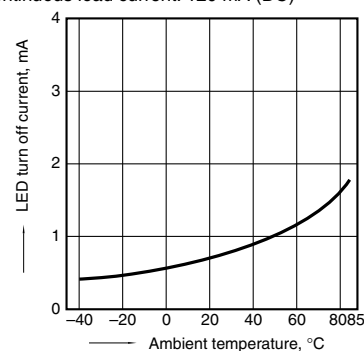
## 5. LED operate current vs. ambient temperature characteristics

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



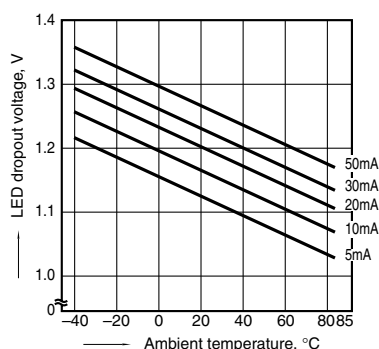
## 6. LED turn off current vs. ambient temperature characteristics

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



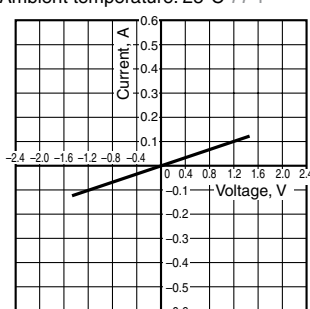
## 7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



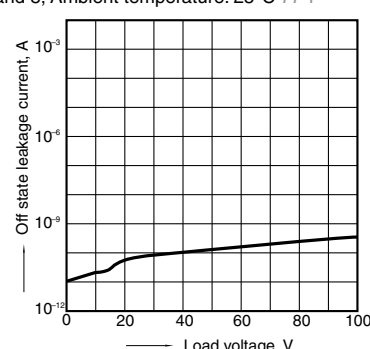
## 8. Current vs. voltage characteristics of output at MOS portion

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



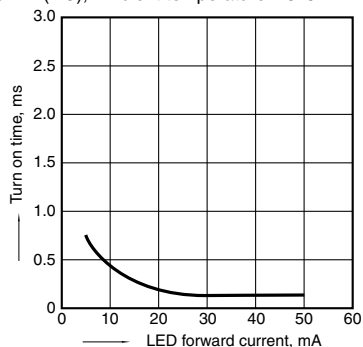
## 9. Off state leakage current vs. load voltage characteristics

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



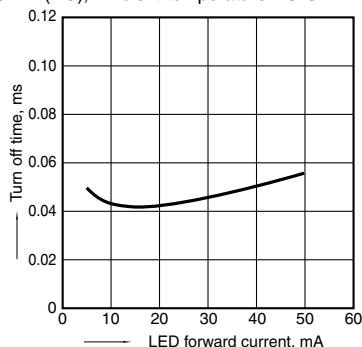
## 10. Turn on time vs. LED forward current characteristics

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



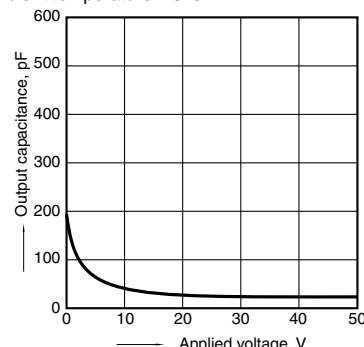
## 11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: 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



# AMEYA360

## Components Supply Platform

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