



mm inch



RoHS compliant

## FEATURES

### 1. Flat-Packaged type

(W) 8.8 × (D) 9.3 × (H) 3.9 mm

(W) .346 × (D) .366 × (H) .154 inch

### 2. High capacity of continuous load current 2A (AQY272)

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

Max. 2A load can be controlled with 5mA input current. The on-resistance is low at typ. 0.11Ω (AQY272).

## TYPICAL APPLICATIONS

- Measuring and Testing equipment
- IC Testers and Board Testers
- High speed inspection machines

## TYPES

| Type           | Output rating* |              | Package        | Part No.              |                        |                              |                              | Packing quantity   |            |               |
|----------------|----------------|--------------|----------------|-----------------------|------------------------|------------------------------|------------------------------|--|------------|---------------|
|                | Load voltage   | Load current |                | Through hole terminal | Surface-mount terminal |                              |                              |  | Tube       | Tape and reel |
|                |                |              |                |                       | Tube packing style     |                              | Tape and reel packing style  |  |            |               |
|                |                |              |                |                       |                        | Picked from the 1/2-pin side | Picked from the 3/4-pin side |  |            |               |
| AC/DC dual use | 60V            | 2.0A         | Power-DIP4-pin | AQY272                | AQY272A                | AQY272AX                     | AQY272AZ                     | 1 tube contains: 50 pcs.<br>1 batch contains: 1,000 pcs. | 1,000 pcs. |               |
|                | 100V           | 1.3A         |                | AQY275                | AQY275A                | AQY275AX                     | AQY275AZ                     |  |            |               |
|                | 200V           | 0.65A        |                | AQY277                | AQY277A                | AQY277AX                     | AQY277AZ                     |  |            |               |
|                | 400V           | 0.35A        |                | AQY274                | AQY274A                | AQY274AX                     | AQY274AZ                     |  |            |               |

\* 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            | AQY272(A)                       | AQY275(A) | AQY277(A) | AQY274(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>    | 60 V                            | 100 V     | 200 V     | 400 V     |                                     |
|                         | Continuous load current | I <sub>L</sub>    | 2.0 A                           | 1.3 A     | 0.65 A    | 0.35 A    | Peak AC, DC                         |
|                         | Peak load current       | I <sub>peak</sub> | 6.0 A                           | 4.0 A     | 2.0 A     | 1.0 A     | 100ms (1 shot), V <sub>L</sub> = DC |
|                         | Power dissipation       | P <sub>out</sub>  | 700 mW                          |           |           |           |                                     |
| Total power dissipation |                         | P <sub>T</sub>    | 750 mW                          |           |           |           |                                     |
| I/O isolation voltage   |                         | V <sub>iso</sub>  | 2,500 V AC                      |           |           |           |                                     |
| 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 |           |           |           |                                     |

# PD 1 Form A (AQY270)

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

| Item                             |                           | Symbol                                    | AQY272(A)        | AQY275(A)     | AQY277(A)    | AQY274(A)  | Condition  |
|----------------------------------|---------------------------|---|------------------|---------------|--------------|--|--|
| Input                            | LED operate current       | Typical                                   | 1.0 mA           |               |              |  | $I_L = 100 \text{ mA}$<br>$V_L = 10 \text{ V}$   |
|                                  |                           | Maximum                                   | 3.0 mA           |               |              |  |  |
|                                  | LED turn off current      | Minimum                                   | 0.4 mA           |               |              |  | $I_L = 100 \text{ mA}$<br>$V_L = 10 \text{ V}$   |
|                                  |                           | Typical                                   | 0.9 mA           |               |              |  |  |
| LED dropout voltage              | Typical                   | 1.25 V (1.16 V at $I_F = 10 \text{ mA}$ ) |                  |               |              | $I_F = 50 \text{ mA}$  |  |
|                                  | Maximum                   | 1.5 V                                     |                  |               |              |  |  |
| Output                           | On resistance             | Typical                                   | 0.11 $\Omega$    | 0.23 $\Omega$ | 0.7 $\Omega$ | 2.1 $\Omega$   | $I_F = 10 \text{ mA}$ , $I_L = \text{Max.}$<br>Within 1 s on time                        |
|                                  |                           | Maximum                                   | 0.18 $\Omega$    | 0.34 $\Omega$ | 1.1 $\Omega$ | 3.2 $\Omega$   |  |
|                                  | Off state leakage current | Maximum                                   | 10 $\mu\text{A}$ |               |              |  | $I_F = 0 \text{ mA}$ , $V_L = \text{Max.}$   |
| Transfer characteristics         | Turn on time*             | Typical                                   | 2.46 ms          | 2.40 ms       | 1.12 ms      | 1.65 ms  | $I_F = 10 \text{ mA}$ , $I_L = 100 \text{ mA}$<br>$V_L = 10 \text{ V}$                   |
|                                  |                           | Maximum                                   | 5.0 ms           |               |              |  |  |
|                                  |                           | Typical                                   | 5.64 ms          | 5.65 ms       | 2.57 ms      | 3.88 ms  | $I_F = 5 \text{ mA}$ , $I_L = 100 \text{ mA}$<br>$V_L = 10 \text{ V}$                    |
|                                  |                           | Maximum                                   | 10.0 ms          |               |              |  |  |
|                                  | Turn off time*            | Typical                                   | 0.22 ms          | 0.21 ms       | 0.10 ms      | 0.08 ms  | $I_F = 5 \text{ mA}$ or $10 \text{ mA}$ , $I_L = 100 \text{ mA}$<br>$V_L = 10 \text{ V}$ |
|                                  |                           | Maximum                                   | 3.0 ms           |               |              |  |  |
|                                  | I/O capacitance           | Typical                                   | 0.8 pF           |               |              |  | $f = 1 \text{ MHz}$<br>$V_B = 0 \text{ V}$   |
|                                  |                           | Maximum                                   | 1.5 pF           |               |              |  |  |
| Initial I/O isolation resistance | Minimum                   | 1,000 M $\Omega$                          |                  |               |              | 500 V DC   |  |
| Maximum operating speed          | Maximum                   | —   |                  |               |              | $I_F = 10 \text{ mA}$ , Duty factor = 50%<br>$I_L = \text{Max.}$ , $V_L = \text{Max.}$ |  |

\*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 to 10           | 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:  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
 $-40^\circ\text{F}$  to  $+185^\circ\text{F}$



### 2.-(1) On resistance vs. ambient temperature characteristics

LED current: 10 mA;  
Continuous load current: 2.0 A (DC) (AQY272),  
1.3 A (DC) (AQY275)



### 2.-(2) On resistance vs. ambient temperature characteristics

LED current: 10 mA;  
Continuous load current: 0.65 A (DC) (AQY277),  
0.35 A (DC) (AQY274)



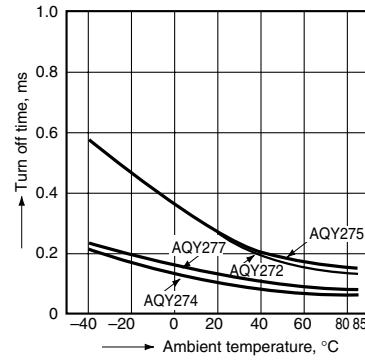
### 3. Turn on time vs. ambient temperature characteristics

LED current: 10 mA; Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



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

LED current: 10 mA; Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



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

Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



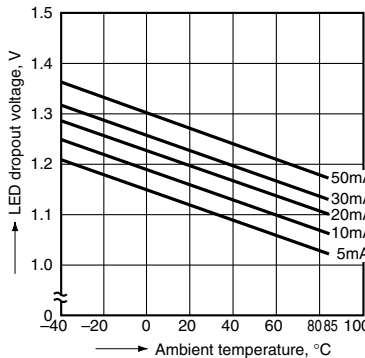
### 6. LED turn off current vs. ambient temperature characteristics

Load voltage: 10 V (DC);  
Continuous load current: 100 mA (DC)



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

Sample: all types;  
LED current: 5 to 50 mA



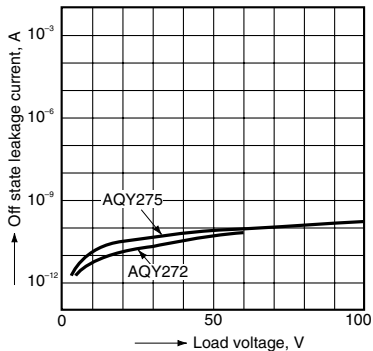
### 8. Current vs. voltage characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



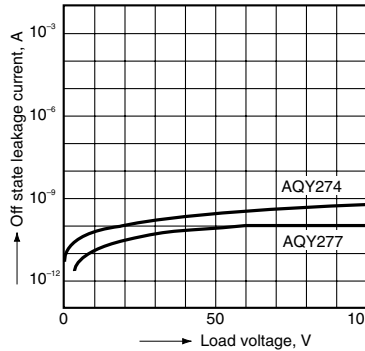
### 9.-(1) Off state leakage current vs. load voltage characteristics

Ambient temperature: 25°C 77°F



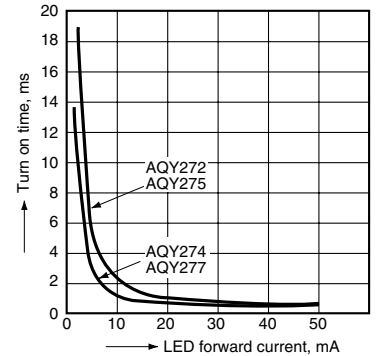
### 9.-(2) Off state leakage current vs. load voltage characteristics

Ambient temperature: 25°C 77°F



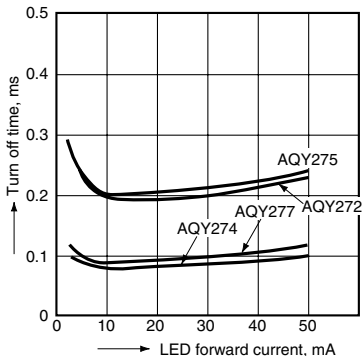
### 10. Turn on time vs. LED forward current characteristics

Load voltage: 10 V (DC); Continuous load current: 100 mA (DC); Ambient temperature: 25°C 77°F



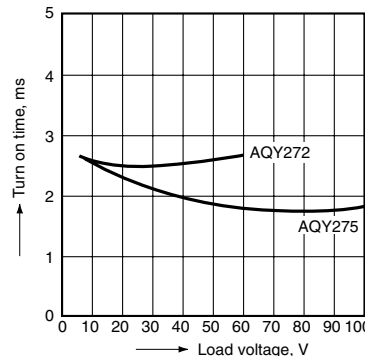
### 11. Turn off time vs. LED forward current characteristics

Load voltage: 10 V (DC); Continuous load current: 100 mA (DC); Ambient temperature: 25°C 77°F



### 12.-(1) Turn on time vs. load voltage characteristics

LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



### 12.-(2) Turn on time vs. load voltage characteristics

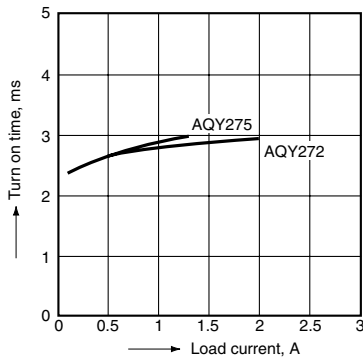
LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



# PD 1 Form A (AQY27○)

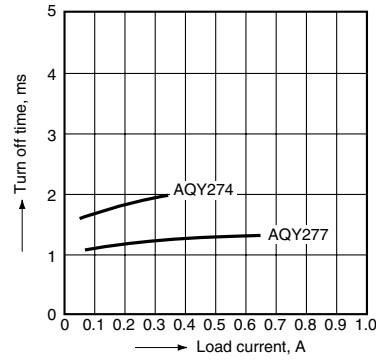
## 13.-(1) Turn on time vs. load current characteristics

LED current: 10 mA; Load voltage: 10 V (DC);  
Ambient temperature: 25°C 77°F



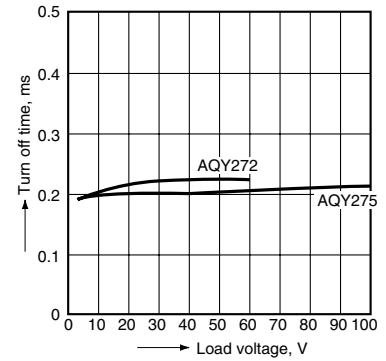
## 13.-(2) Turn on time vs. load current characteristics

LED current: 10 mA; Load voltage: 10 V (DC);  
Ambient temperature: 25°C 77°F



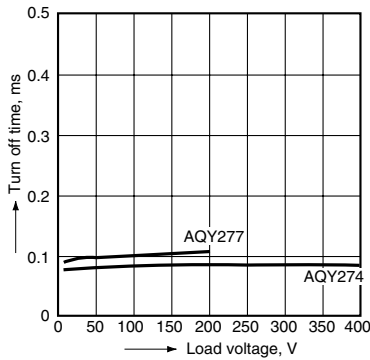
## 14.-(1) Turn off time vs. load voltage characteristics

LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



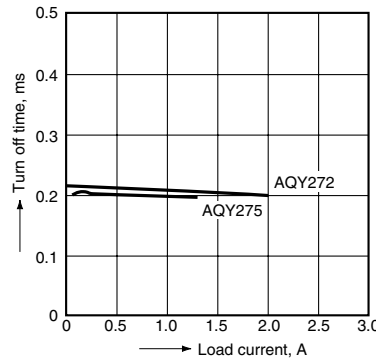
## 14.-(2) Turn off time vs. load voltage characteristics

LED current: 10 mA; Continuous load current: 100 mA; Ambient temperature: 25°C 77°F



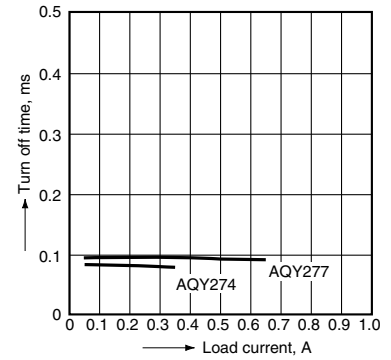
## 15.-(1) Turn off time vs. load current characteristics

LED current: 10 mA; Load voltage 10 V (DC);  
Ambient temperature: 25°C 77°F



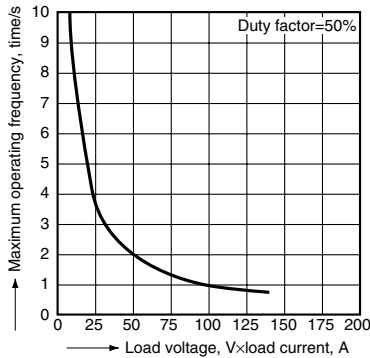
## 15.-(2) Turn off time vs. load current characteristics

LED current: 10 mA; Load voltage 10 V (DC);  
Ambient temperature: 25°C 77°F



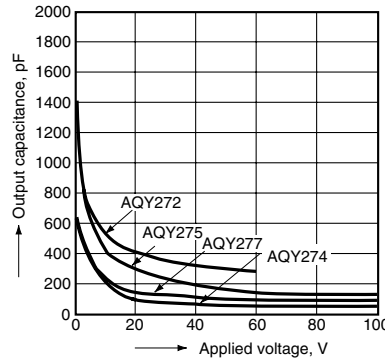
## 16. Maximum operating frequency vs. load voltage/current characteristics

Sample: All types; LED current: 10 mA;  
Ambient temperature: 25°C 77°F



## 17. Output capacitance vs. applied voltage characteristics

Frequency: 1 MHz;  
Ambient temperature: 25°C 77°F



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### Наши контакты:

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331