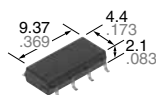
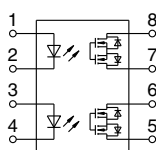


### Miniature SOP8-pin type Low on-resistance 200V load voltage

PhotoMOS®  
RF SOP 2 Form A  
Low on-resistance (AQW227NS)



mm inch



RoHS compliant

### FEATURES

- 2-channel (Form A) in SOP8-pin package miniature**  
(W) 4.4 × (L) 9.37 × (H) 2.1 mm (W) .173 × (L) .369 × (H) .083 inch —approx. 38% of the volume and 66% of the footprint size of DIP8-pin.
- Low output capacitance**  
The capacitance between output terminals is small; Typ. 10pF.
- High response speed**  
This enables a fast operation speed of Typ. 0.25ms.
- Low-level off state leakage current**
- Controls low-level analog signals**

### TYPICAL APPLICATIONS

- Telephones
- Measuring instruments
- Computer input machines
- Industrial robots

### TYPES

|                | Output rating* |              | Package  | Part No.           |                                  |                                  | Packing quantity                                               |               |
|----------------|----------------|--------------|----------|--------------------|----------------------------------|----------------------------------|----------------------------------------------------------------|---------------|
|                | 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 | 200V           | 40mA         | SOP8-pin | AQW227NS           | AQW227NSX                        | AQW227NSZ                        | 1 tube contains:<br>50 pcs.<br>1 batch contains:<br>1,000 pcs. | 1,000 pcs.    |

\* Indicate the peak AC and DC values.

Note: The packing style indicator "X" or "Z" is not marked on the device.

### RATING

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

| Item                    |                         | Symbol     | AQW227NS                    | Remarks                                          |
|-------------------------|-------------------------|------------|-----------------------------|--------------------------------------------------|
| Input                   | LED forward current     | $I_F$      | 50 mA                       |                                                  |
|                         | LED reverse voltage     | $V_R$      | 5 V                         |                                                  |
|                         | Peak forward current    | $I_{FP}$   | 1 A                         | $f = 100 \text{ Hz}$ , Duty factor = 0.1%        |
|                         | Power dissipation       | $P_{in}$   | 75 mW                       |                                                  |
| Output                  | Load voltage (peak AC)  | $V_L$      | 200 V                       |                                                  |
|                         | Continuous load current | $I_L$      | 0.04 A (0.05 A)             | Peak AC, DC ( ): in case of using only 1 channel |
|                         | Peak load current       | $I_{peak}$ | 0.15 A                      | 100 ms (1 shot), $V_L = \text{DC}$               |
|                         | Power dissipation       | $P_{out}$  | 600 mW                      |                                                  |
| Total power dissipation |                         | $P_T$      | 650 mW                      |                                                  |
| I/O isolation voltage   |                         | $V_{iso}$  | 1,500 Vrms                  |                                                  |
| Ambient temperature     | Operating               | $T_{opr}$  | −40 to +85°C −40 to +185°F  | (Non-icing at low temperatures)                  |
|                         | Storage                 | $T_{stg}$  | −40 to +100°C −40 to +212°F |                                                  |

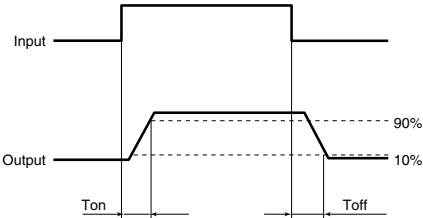
RF SOP 2 Form A Low on-resistance (AQW227NS)

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

| Item                             |                           |                  | Symbol            | AQW227NS                             | Condition                                                 |
|----------------------------------|---------------------------|------------------|-------------------|--------------------------------------|-----------------------------------------------------------|
| Input                            | LED operate current       | Typical          | I <sub>Fon</sub>  | 0.7mA                                | I <sub>L</sub> =Max.                                      |
|                                  |                           | Maximum          |                   | 3.0mA                                |                                                           |
|                                  | LED turn off current      | Minimum          | I <sub>Foff</sub> | 0.4mA                                | I <sub>L</sub> =Max.                                      |
|                                  |                           | Typical          |                   | 0.65mA                               |                                                           |
|                                  | LED dropout voltage       | Typical          | V <sub>F</sub>    | 1.25V (1.14V at I <sub>F</sub> =5mA) | I <sub>F</sub> =50mA                                      |
|                                  |                           | Maximum          |                   | 1.5V                                 |                                                           |
| Output                           | On resistance             | Typical          | R <sub>on</sub>   | 30Ω                                  | I <sub>F</sub> =5mA<br>I <sub>L</sub> =Max.<br>Within 1 s |
|                                  |                           | Maximum          |                   | 50Ω                                  |                                                           |
|                                  | Output capacitance        | Typical          | C <sub>out</sub>  | 10pF                                 | I <sub>F</sub> =0mA<br>V <sub>B</sub> =0V<br>f=1 MHz      |
|                                  |                           | Maximum          |                   | 15pF                                 |                                                           |
|                                  | Off state leakage current | Maximum          | I <sub>Leak</sub> | *10nA                                | I <sub>F</sub> =0mA<br>V <sub>L</sub> =Max.               |
|                                  | Transfer characteristics  | Turn on time**   | Typical           | T <sub>on</sub>                      | 0.25ms                                                    |
| Maximum                          |                           |                  | 0.5ms             |                                      |                                                           |
| Turn off time**                  |                           | Typical          | T <sub>off</sub>  | 0.08ms                               | I <sub>F</sub> =5mA<br>I <sub>L</sub> =Max.               |
|                                  |                           | Maximum          |                   | 0.2ms                                |                                                           |
| I/O capacitance                  |                           | Typical          | C <sub>iso</sub>  | 0.8pF                                | f=1MHz<br>V <sub>B</sub> =0V                              |
|                                  |                           | Maximum          |                   | 1.5pF                                |                                                           |
| Initial I/O isolation resistance | Minimum                   | R <sub>iso</sub> | 1,000MΩ           | 500V DC                              |                                                           |

\*Available as custom orders (1 nA or less)

\*\*Turn on/Turn off time



3. Recommended operating conditions (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

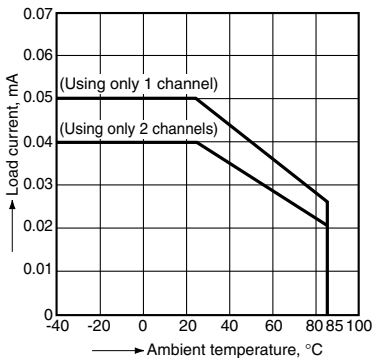
| Item     |                         | Symbol         | Number of used channels | Min. | Max.         | Unit |
|----------|-------------------------|----------------|-------------------------|------|--------------|------|
| AQW227NS | LED current             | I <sub>F</sub> |                         | 5    | 30           | mA   |
|          | Load voltage (Peak AC)  | V <sub>L</sub> |                         | —    | 160          | V    |
|          | Continuous load current | I <sub>L</sub> | 1ch<br>2ch              | —    | 0.05<br>0.04 | A    |

■ 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.

REFERENCE DATA

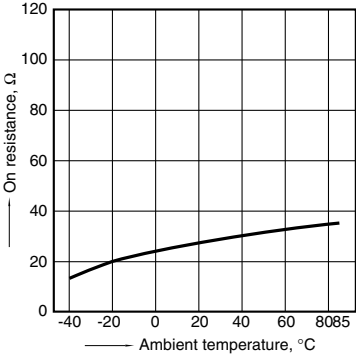
1. Load current vs. ambient temperature characteristics

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



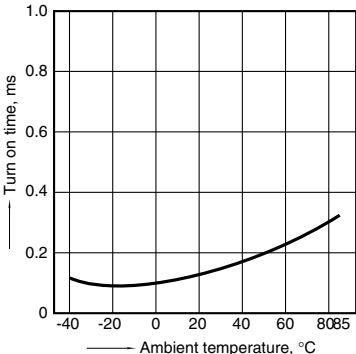
2. On resistance vs. ambient temperature characteristics

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



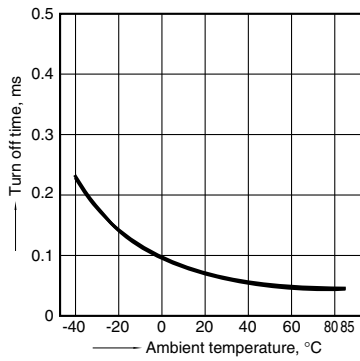
3. Turn on time vs. ambient temperature characteristics

LED current: 5 mA;  
Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



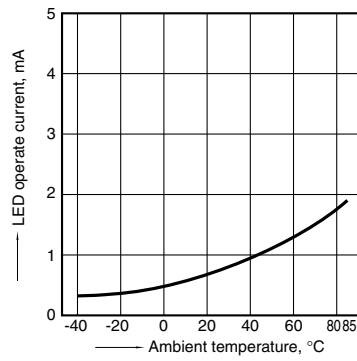
## 4. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



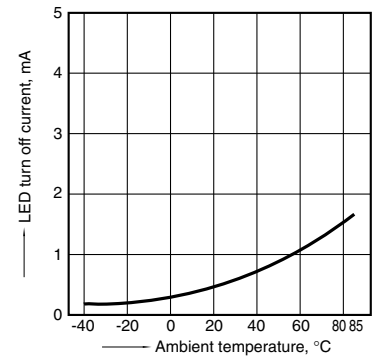
## 5. LED operate current vs. ambient temperature characteristics

Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



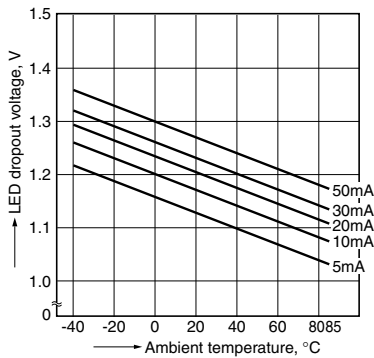
## 6. LED turn off current vs. ambient temperature characteristics

Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



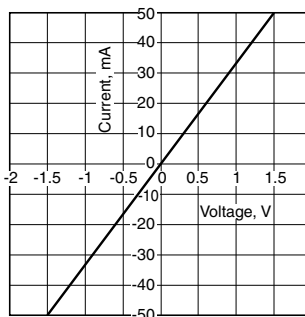
## 7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



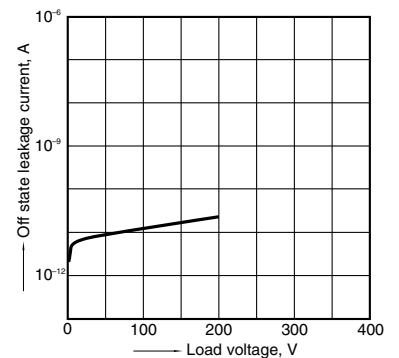
## 8. Current vs. voltage characteristics of output at MOS portion

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



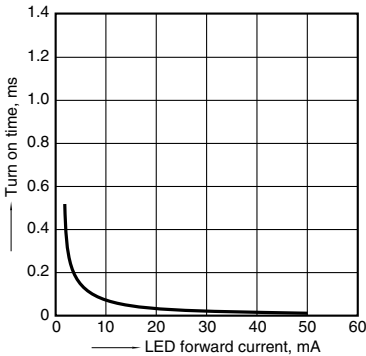
## 9. Off state leakage current vs. load voltage characteristics

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



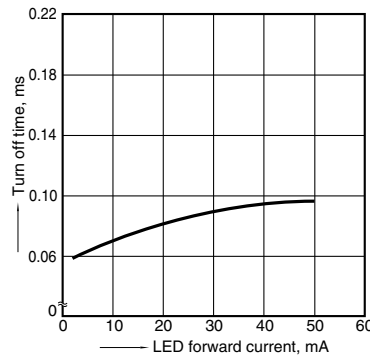
## 10. Turn on time vs. LED forward current characteristics

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



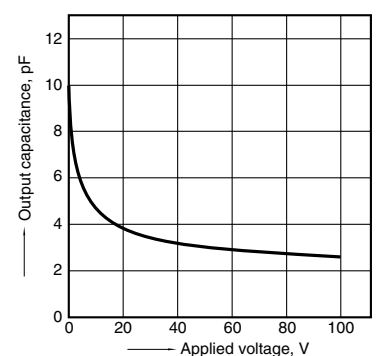
## 11. Turn off time vs. LED forward current characteristics

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



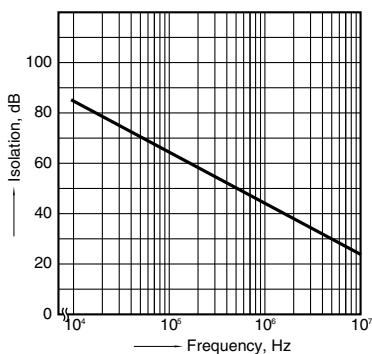
## 12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8;  
Frequency: 1 MHz, 30mVrms;  
Ambient temperature: 25°C 77°F



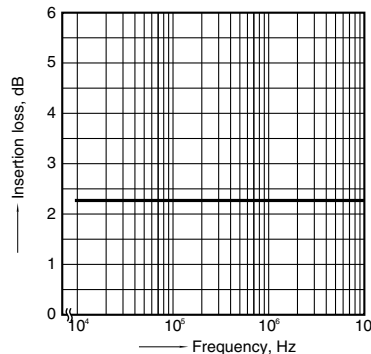
## 13. Isolation vs. frequency characteristics (50 Ω impedance)

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



## 14. Insertion loss vs. frequency characteristics (50 Ω impedance)

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



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Please contact .....

**Panasonic Corporation**

Electromechanical Control Business Division

■ 1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan  
[industrial.panasonic.com/ac/e/](http://industrial.panasonic.com/ac/e/)

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