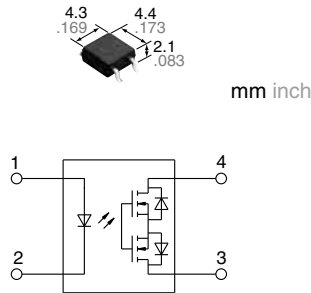


|  |  |
|--|--|
| <b>Miniature SOP4-pin<br/>C×R10 40V load voltage</b> | <b>PhotoMOS®<br/>RF SOP 1 Form A C×R10<br/>(AQY221○2S)</b> |
|--|--|



**RoHS compliant**

### FEATURES

**1. Both low on-resistance (R type) and low capacitance (C type) available at excellent characteristics of C×R10**

|                           | AQY221R2S<br>(R type) | AQY221N2S<br>(C type) |
|---------------------------|-----------------------|-----------------------|
| Low on resistance: R      | 0.8Ω                  | 9.5Ω                  |
| Low output capacitance: C | 13pF                  | 1pF                   |

**2. High speed switching**

Turn on time: Typ. 0.03ms

Turn off time: Typ. 0.03ms

(AQY221N2S)

**3. Small profile of miniature SOP4-pin**

**4. Low-level off state leakage current of Typ. 0.01nA (AQY221N2S)**

### TYPICAL APPLICATIONS

**1. Measuring and testing equipment**  
IC tester, Liquid crystal driver tester, Semiconductor performance tester, Bare board tester, In-circuit tester, Function tester, etc.

**2. Telecommunication and broadcasting equipment**

**3. Medical equipment**

Ultrasonic wave diagnostic machine

**4. Multi-point recorder**

Data logger, Warping and Thermocouple, etc.

### TYPES

|                | Type                       | 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-pin side | Picked from the 3/4-pin side |   |               |
| AC/DC dual use | Low on resistance (R type) | 40V            | 250mA        | SOP4-pin | AQY221R2S          | AQY221R2SX                   | AQY221R2SZ                   | 1 tube contains: 100 pcs.<br>1 batch contains: 2,000 pcs. | 1,000 pcs.    |
|                | Low capacitance (C type)   | 40V            | 120mA        |          | AQY221N2S          | AQY221N2SX                   | AQY221N2SZ                   |   |               |

\* Indicate the peak AC and DC values.

Note: For space reasons, the initial letters of the part number "AQY", the package (SOP) indicator "S" and the packing style indicator "X" or "Z" are not marked on the device. (Ex. the label for product number AQY221R2SX is 221R2)

### RATING

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

| Item                    |                         | Symbol            | AQY221R2S<br>(R type)       | AQY221N2S<br>(C type) | Remarks                              |
|-------------------------|-------------------------|-------------------|-----------------------------|-----------------------|--------------------------------------|
| Input                   | LED forward current     | I <sub>F</sub>    | 50mA                        |                       |                                      |
|                         | LED reverse voltage     | V <sub>R</sub>    | 5V                          |                       |                                      |
|                         | Peak forward current    | I <sub>FP</sub>   | 1A                          |                       | f=100 Hz, Duty factor=0.1%           |
|                         | Power dissipation       | P <sub>in</sub>   | 75mW                        |                       |                                      |
| Output                  | Load voltage (peak AC)  | V <sub>L</sub>    | 40V                         |                       |                                      |
|                         | Continuous load current | I <sub>L</sub>    | 0.25A                       | 0.12A                 | Peak AC, DC                          |
|                         | Peak load current       | I <sub>peak</sub> | 0.75A                       | 0.30A                 | 100 ms (1 shot), V <sub>L</sub> = DC |
|                         | Power dissipation       | P <sub>out</sub>  | 300mW                       |                       |                                      |
| Total power dissipation |                         | P <sub>T</sub>    | 350mW                       |                       |                                      |
| I/O isolation voltage   |                         | V <sub>iso</sub>  | 500Vrms                     | 1,500Vrms             |                                      |
| Ambient temperature     | Operating               | T <sub>opr</sub>  | -40 to +85°C -40 to +185°F  |                       | (Non-icing at low temperatures)      |
|                         | Storage                 | T <sub>stg</sub>  | -40 to +100°C -40 to +212°F |                       |                                      |

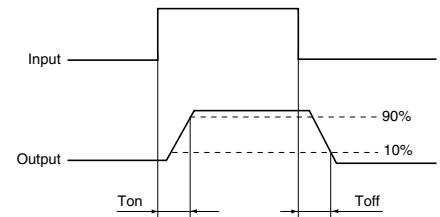
# RF SOP 1 Form A C×R10 (AQY221○2S)

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

| Item                             |                      | Symbol                                   | AQY221R2S (R type) | AQY221N2S (C type)                          | Condition  |
|----------------------------------|----------------------|--|--------------------|---|--|
| Input                            | LED operate current  | Typical                                  | 0.5 mA             | 0.9 mA                                      | $I_L = 250 \text{ mA}$ (R type)<br>$I_L = 80 \text{ mA}$ (C type)  |
|                                  |                      | Maximum                                  | 3.0 mA             |   |  |
|                                  | LED turn off current | Minimum                                  | 0.1 mA             | 0.2 mA                                      | $I_L = 250 \text{ mA}$ (R type)<br>$I_L = 80 \text{ mA}$ (C type)  |
|                                  |                      | Typical                                  | 0.4 mA             | 0.85 mA                                     |  |
| LED dropout voltage              | Typical              | 1.25 V (1.14 V at $I_F = 5 \text{ mA}$ ) |                    |   | $I_F = 50 \text{ mA}$  |
|                                  | Maximum              | 1.5 V                                    |                    |   |  |
| Output                           | On resistance        | Typical                                  | 0.8Ω               | 9.5Ω  | $I_F = 5 \text{ mA}$<br>$I_L = 250 \text{ mA}$ (R type),<br>$I_L = 80 \text{ mA}$ (C type)<br>Within 1 s |
|                                  |                      | Maximum                                  | 1.25Ω              | 12.5Ω                                       |  |
|                                  | Output capacitance   | Typical                                  | 13 pF              | 1.0 pF                                      | $I_F = 0 \text{ mA}$<br>$V_B = 0 \text{ V}$<br>$f = 1 \text{ MHz}$                                       |
|                                  |                      | Maximum                                  | 18 pF              | 1.5 pF                                      |  |
| Off state leakage current        | Typical              | 0.03 nA                                  | 0.01 nA            | $I_F = 0 \text{ mA}$<br>$V_L = \text{Max.}$ |  |
|                                  | Maximum              | *10 nA                                   |                    |   |  |
| Transfer characteristics         | Turn on time**       | Typical                                  | 0.1 ms             | 0.03 ms                                     | $I_F = 5 \text{ mA}$<br>$V_L = 10 \text{ V}$<br>$R_L = 40\Omega$ (R type),<br>125Ω (C type)              |
|                                  |                      | Maximum                                  | 0.5ms              |   |  |
|                                  | Turn off time**      | Typical                                  | 0.06 ms            | 0.03 ms                                     | $I_F = 5 \text{ mA}$<br>$V_L = 10 \text{ V}$<br>$R_L = 40\Omega$ (R type),<br>125Ω (C type)              |
|                                  |                      | Maximum                                  | 0.2 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              | $R_{iso}$                                | 1,000MΩ            | 500 V 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                  | Min.  | Max. | Unit |   |
|-------------|-------------------------|-------|------|------|---|
| LED current | $I_F$                   | 5     | 30   | mA   |   |
| AQY221R2S   | Load voltage (Peak AC)  | $V_L$ | —    | 15   | V |
|             | Continuous load current | $I_L$ | —    | 0.25 | A |
| AQY221N2S   | Load voltage (Peak AC)  | $V_L$ | —    | 15   | V |
|             | Continuous load current | $I_L$ | —    | 0.12 | A |

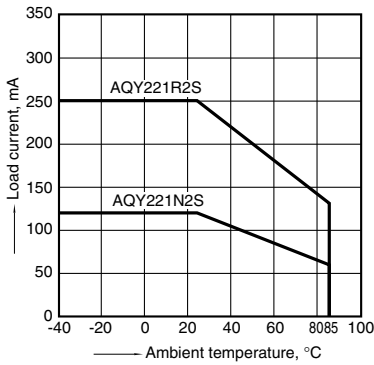
■ These products are not designed for automotive use.

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

## REFERENCE DATA

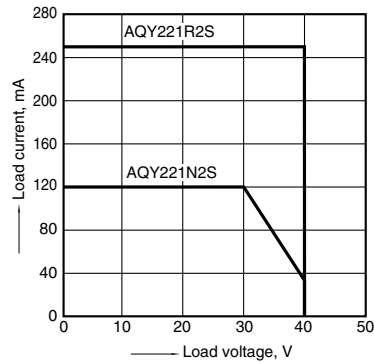
### 1. Load current vs. ambient temperature characteristics

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



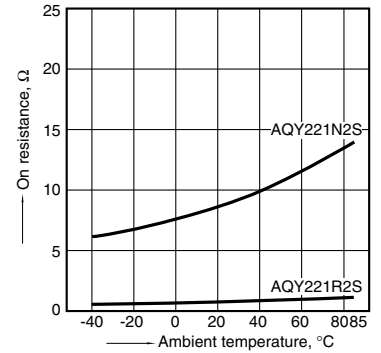
### 2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



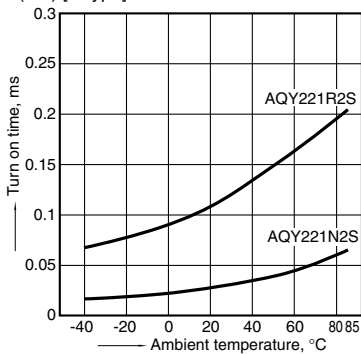
### 3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
LED current: 5 mA; Load voltage: Max. (DC);  
Load current: 250mA (DC) [R type], 80mA (DC) [C type]



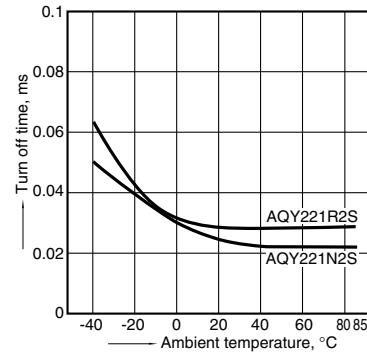
### 4. Turn on time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
LED current: 5 mA; Load voltage: 10V (DC);  
Continuous load current: 250mA (DC) [R type],  
80mA (DC) [C type]



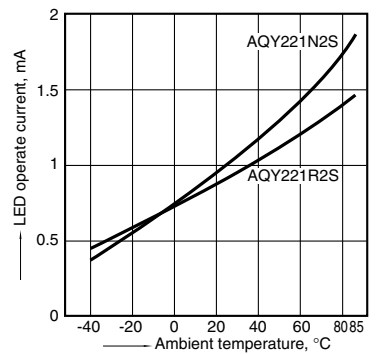
### 5. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10V (DC);  
Continuous load current: 250mA (DC) [R type],  
80mA (DC) [C type]



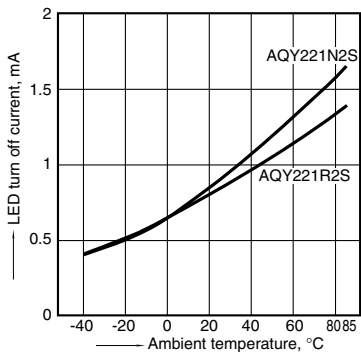
### 6. LED operate current vs. ambient temperature characteristics

Load voltage: Max. (DC);  
Continuous load current: 250mA (DC) [R type],  
80mA (DC) [C type]



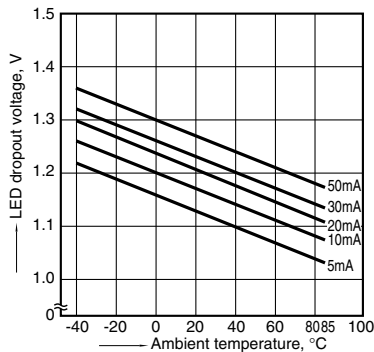
### 7. LED turn off current vs. ambient temperature characteristics

Load voltage: Max. (DC); Continuous load current:  
250mA (DC) [R type], 80mA (DC) [C type];



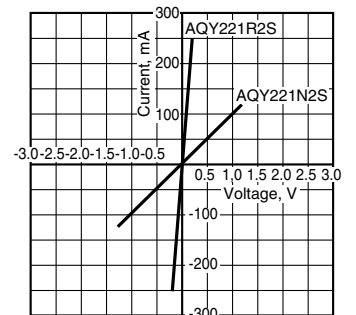
### 8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



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

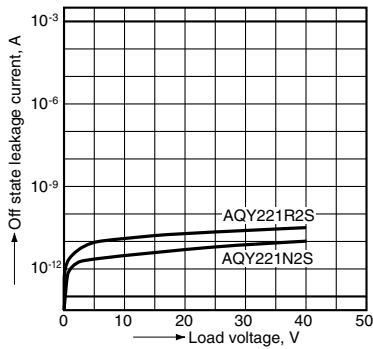
Measured portion: between terminals 3 and 4  
Ambient temperature: 25°C 77°F



# RF SOP 1 Form A CxR10 (AQY221O2S)

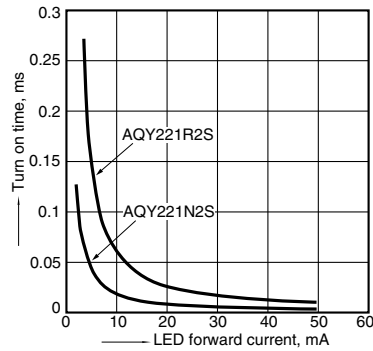
## 10. Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4  
Ambient temperature: 25°C 77°F



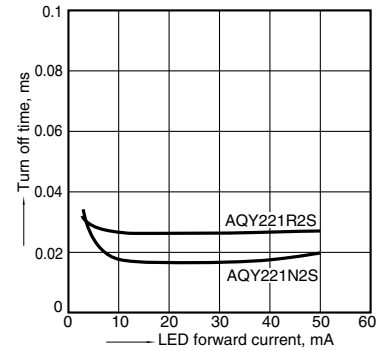
## 11. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC); Continuous load current: 250mA (DC) [R type], 80mA (DC) [C type];  
Ambient temperature: 25°C 77°F



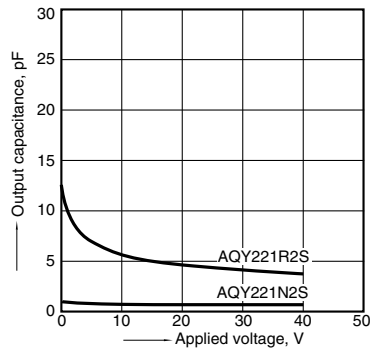
## 12. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC); Continuous load current: 250mA (DC) [R type], 80mA (DC) [C type];  
Ambient temperature: 25°C 77°F



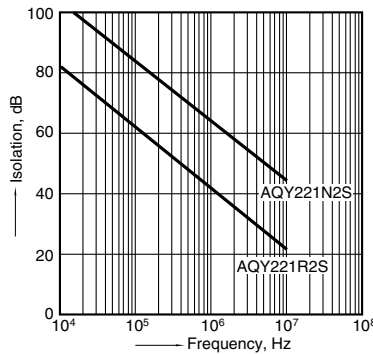
## 13. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 3 and 4  
Frequency: 1 MHz, 30mVrms; Ambient temperature: 25°C 77°F



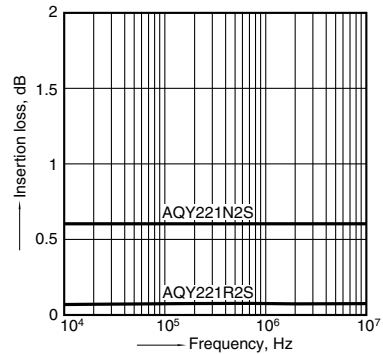
## 14. Isolation vs. frequency characteristics (50Ω impedance)

Measured portion: between terminals 3 and 4  
Ambient temperature: 25°C 77°F



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

Measured portion: between terminals 3 and 4  
Ambient temperature: 25°C 77°F



"PhotoMOS®", "PhotoMOS" and "PHOTOMOS" are registered trademarks of Panasonic Corporation.

\*Recognized in Japan, the United States, all member states of European Union and other countries.

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/)

**Panasonic®**

©Panasonic Corporation 2017

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Panasonic:

[AQY221R2S](#) [AQY221N2S](#)

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9