



mm inch



RoHS compliant

### FEATURES

#### 1. Built-in input resistor means less man-hours when mounting

The voltage-sensitive type, which eliminates the need to mount an external input resistor, is now available in a small package. Man-hours spent mounting external input resistors are cut and board designing is simplified.

#### 2. Saves space on PC board

Since the small package size remains the same while including a built-in input resistor, space on the PC board is saved. This makes it easier to incorporate space savings when designing miniature devices.



<Artistic impression of PC board space savings due to built-in resistor>  
In case of SSOP.

#### 3. Both low on-resistance (R type) and low capacitance (C type) available at excellent electrical characteristics of CxR10

- R type: On resistance 0.8Ω (typ.)  
Output capacitance 14pF (typ.)
- C type: On resistance 9.5Ω (typ.)  
Output capacitance 1.1pF (typ.)

### TYPICAL APPLICATIONS

#### For multi-circuit switching;

1. Measuring and testing equipment  
Semiconductor testing equipment, Probe cards, Datalogger, Board tester and other testing equipment
2. Telecommunication and broadcasting equipment
3. Medical equipment

### TYPES

|                | Type                       | Output rating*1 |              | Package   | Part No.*2         |  |   | Packing quantity   |               |
|----------------|----------------------------|-----------------|--------------|-----------|--------------------|--|---|--|---------------|
|                |                            | Load voltage    | Load current |           | Tube packing style | Tape and reel packing style              |   | Tube   | Tape and reel |
|                |                            |                 |              |           |                    | Picked from the 1/2/3/4/5/6/7/8-pin side | Picked from the 9/10/11/12/13/14/15/16-pin side |  |               |
| AC/DC dual use | Low on resistance (R type) | 40 V            | 0.16A        | SOP16-pin | AQS221FR2S         | AQS221FR2SX                              | AQS221FR2SZ                                     | 1 tube contains: 50 pcs.<br>1 batch contains: 1,000 pcs. | 1,000 pcs.    |
|                | Low capacitance (C type)   | 40 V            | 0.06A        |           | AQS221FN2S         | AQS221FN2SX                              | AQS221FN2SZ                                     |  |               |

Notes: \*1 Indicate the peak AC and DC values.

\*2 The packing style indicator "X" or "Z" is not marked on the device.

### RATING

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

| Item                    |                        | Symbol            | AQS221FR2S                      | AQS221FN2S | Remarks                            |
|-------------------------|------------------------|-------------------|---------------------------------|------------|------------------------------------|
| Input                   | Input voltage          | V <sub>IN</sub>   | 6V                              |            |                                    |
|                         | Input reverse voltage  | V <sub>RIN</sub>  | 5V                              |            |                                    |
|                         | Power dissipation      | P <sub>in</sub>   | 260mW                           |            | 65mW for 1a                        |
| Output                  | Load voltage (peak AC) | V <sub>L</sub>    | 40V                             | 40V        |                                    |
|                         | Load current           | I <sub>L</sub>    | 0.16A                           | 0.06A      | Peak AC, DC                        |
|                         | Peak load current      | I <sub>peak</sub> | 0.2A                            | 0.12A      | 100ms (1shot), V <sub>L</sub> =DC  |
|                         | Power dissipation      | P <sub>out</sub>  | 600mW                           |            |                                    |
| Total power dissipation |                        | P <sub>T</sub>    | 650mW                           |            |                                    |
| I/O isolation voltage   |                        | V <sub>iso</sub>  | 500V AC                         |            |                                    |
| Operating temperature   |                        | T <sub>opr</sub>  | -40°C to +85°C -40°F to +185°F  |            | Non-condensing at low temperatures |
| Storage temperature     |                        | T <sub>stg</sub>  | -40°C to +100°C -40°F to +212°F |            |                                    |

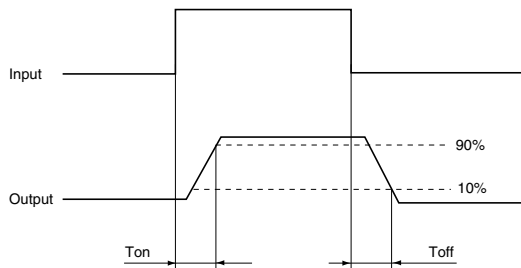
# RF SOP 4 Form A C×R10 Voltage-sensitive (AQS221F○2S)

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

| Item                             |                           | Symbol  | AQS221FR2S | AQS221FN2S           | Condition  |
|----------------------------------|---------------------------|---------|------------|----------------------|--|
| Input                            | Operate voltage           | Typ.    | 1.3V       |                      | I <sub>L</sub> = Max.  |
|                                  |                           | Max.    | 4V         |                      |  |
|                                  | Turn off voltage          | Min.    | 0.8V       |                      |  |
|                                  |                           | Typ.    | 1.3V       |                      |  |
| Input current                    | Typ.                      | 8.5mA   |            | V <sub>IN</sub> = 5V |  |
| Output                           | On resistance             | Typ.    | 0.75Ω      | 9.5Ω                 | V <sub>IN</sub> = 5V<br>I <sub>L</sub> = Max.<br>Within 1 s on time              |
|                                  |                           | Max.    | 1.25Ω      | 12.5Ω                |  |
|                                  | Output capacitance        | Typ.    | 12.5pF     | 1pF                  | V <sub>IN</sub> = 0V<br>V <sub>B</sub> = 0V<br>f = 1MHz                          |
|                                  |                           | Max.    | 18pF       | 1.5pF                |  |
|                                  | Off state leakage current | Typ.    | 0.02nA     | 0.01nA               | V <sub>IN</sub> = 0V<br>V <sub>L</sub> = Max.                                    |
|                                  |                           | Max.    | 10nA       |                      |  |
| Transfer characteristics         | Turn on time*             | Typ.    | 0.07ms     | 0.02ms               | AQS221FR2S:<br>V <sub>IN</sub> = 5V, V <sub>L</sub> = 10V, R <sub>L</sub> = 80Ω  |
|                                  |                           | Max.    | 0.5ms      |                      |  |
|                                  | Turn off time*            | Typ.    | 0.07ms     | 0.02ms               | AQS221FN2S:<br>V <sub>IN</sub> = 5V, V <sub>L</sub> = 10V, R <sub>L</sub> = 500Ω |
|                                  |                           | Max.    | 0.2ms      |                      |  |
|                                  | I/O capacitance           | Typ.    | 0.8pF      |                      | f = 1MHz, V <sub>B</sub> = 0V  |
|                                  |                           | Max.    | 1.5pF      |                      | f = 1MHz, V <sub>B</sub> = 0V  |
| Initial I/O isolation resistance | Min.                      | 1,000MΩ |            | 500V DC              |  |

Note: If you wish to change the input voltage, rating or performance, please inquire with our sales.

\*Turn on/Turn off time



## RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper device operation and resetting.

| Item          | Symbol          | Minimum | Typical | Maximum | Unit |
|---------------|-----------------|---------|---------|---------|------|
| Input voltage | V <sub>IN</sub> | 4.5     | 5       | 5.5     | V    |

■ 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.

# RF SOP 4 Form A C×R10 Voltage-sensitive (AQS221F○2S)

## REFERENCE DATA

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

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



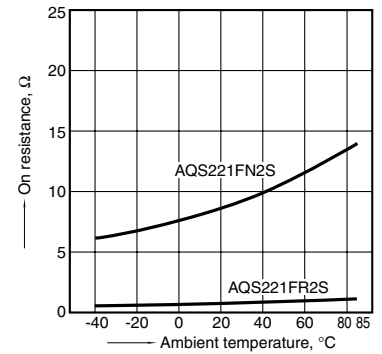
### 2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



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

Input voltage: 5V; Load voltage: 10V (DC);  
Continuous load current: 160mA (DC) R type,  
60mA (DC) C type



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

Input voltage: 5V; Load voltage: 10V (DC);  
Continuous load current: 125mA (DC) R type,  
20mA (DC) C type



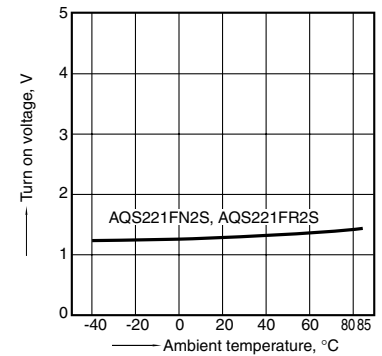
### 5. Turn off time vs. ambient temperature characteristics

Input voltage: 5V; Load voltage: 10V (DC);  
Continuous load current: 125mA (DC) R type,  
20mA (DC) C type



### 6. Turn on voltage vs. ambient temperature characteristics

Load voltage: 10V (DC);  
Continuous load current: 160mA (DC) R type,  
60mA (DC) C type



### 7. Turn off voltage vs. ambient temperature characteristics

Load voltage: 10V (DC);  
Continuous load current: 160mA (DC) R type,  
60mA (DC) C type



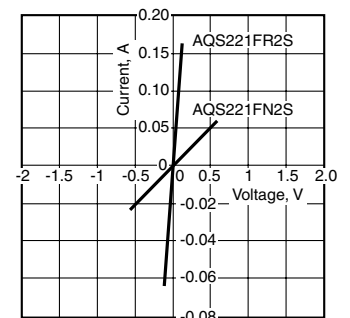
### 8. Input current vs. ambient temperature characteristics

Input voltage: 5V



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

Ambient temperature: 25°C 77°F



# RF SOP 4 Form A C×R10 Voltage-sensitive (AQS221F○2S)

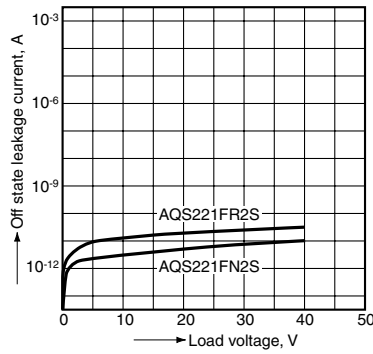
## 10. Input current vs. input voltage characteristics

Ambient temperature: 25°C 77°F  
(Recommended input voltage: 5±0.5V)



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

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



## 12. Turn on time vs. input voltage characteristics

Load voltage: 10V (DC);  
Continuous load current: 125mA (DC) R type,  
20mA (DC) C type; Ambient temperature: 25°C 77°F



## 13. Turn off time vs. input voltage characteristics

Load voltage: 10V (DC);  
Continuous load current: 125mA (DC) R type,  
20mA (DC) C type; Ambient temperature: 25°C 77°F



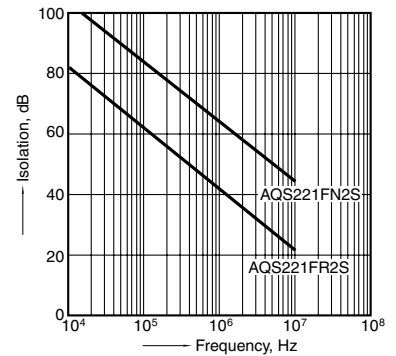
## 14. Output capacitance vs. applied voltage characteristics

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



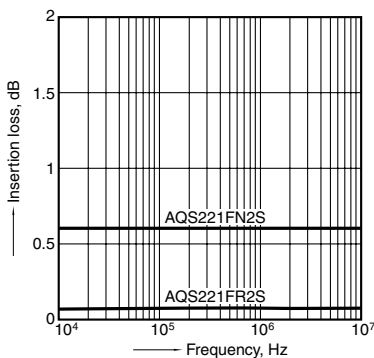
## 15. Isolation vs. frequency characteristics (50Ω impedance)

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



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

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



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Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
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- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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