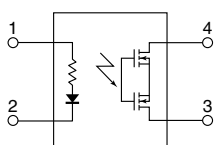


**Space-saving  
SSOP 1 Form A type  
with built-in resistor  
40V load voltage**

**PhotoMOS®  
RF SSOP C×R10  
Voltage-sensitive (AQY221FO2V)**



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. Save space on PC board

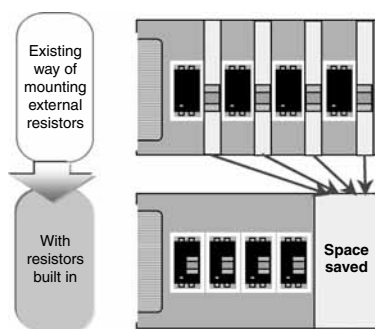
Since the small package size remains the same while including a built-in input resistor, space on the PC board is saved. This makes it easier to incorporate space savings when designing miniature devices.

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

- R type: On resistance 0.75Ω (typ.)  
Output resistance 12.5pF (typ.)
- C type: On resistance 9.5Ω (typ.)  
Output capacitance 1pF (typ.)

### TYPICAL APPLICATIONS

- 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**



<Artistic impression of PC board space savings due to built-in resistor>

### TYPES

|                | Type                       | Output rating*1 |              | Package | Part No.*2   |  | Packing quantity in tape and reel |
|----------------|----------------------------|-----------------|--------------|---------|--|--|-----------------------------------|
|                |                            | Load voltage    | Load current |         | Tape and reel packing style (Picked from the 1 and 4-pin side) | Tape and reel packing style (Picked from the 2 and 3-pin side) |                                   |
| AC/DC dual use | Low on-resistance (R type) | 40 V            | 0.25A        | SSOP    | AQY221FR2VY  | AQY221FR2VW  | 3,500 pcs.                        |
|                | Low capacitance (C type)   | 40 V            | 0.12A        |         | AQY221FN2VY  | AQY221FN2VW  |                                   |

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

\*2 Packing quantity of 1,000 pieces is possible. Please contact our sales office.

For space reasons, the three initial letters of the part number "AQY", and the package (SSOP) indicator "V" and the packing style indicator "Y" or "W" are not marked on the device. (Ex. the label for product number AQY221FR2VY is 221FR2)

### RATING

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

| Item                    | Symbol                 | AQY221FR2V                      | AQY221FN2V | Remarks                            |                         |
|-------------------------|------------------------|---------------------------------|------------|------------------------------------|-------------------------|
| Input                   | Input voltage          | $V_{IN}$                        | 6V         |                                    |                         |
|                         | Input reverse voltage  | $V_{RIN}$                       | 5V         |                                    |                         |
|                         | Power dissipation      | $P_{in}$                        | 65mW       |                                    |                         |
| Output                  | Load voltage (peak AC) | $V_L$                           | 40V        |                                    |                         |
|                         | Load current           | $I_L$                           | 0.25A      | 0.12A                              | Peak AC, DC             |
|                         | Peak load current      | $I_{peak}$                      | 0.75A      | 0.2A                               | 100ms (1shot), $V_L=DC$ |
|                         | Power dissipation      | $P_{out}$                       | 250mW      |                                    |                         |
| Total power dissipation | $P_T$                  | 300mW                           |            |                                    |                         |
| I/O isolation voltage   | $V_{iso}$              | 500V AC                         |            |                                    |                         |
| Operating temperature   | $T_{opr}$              | -40°C to +85°C -40°F to +185°F  |            | Non-condensing at low temperatures |                         |
| Storage temperature     | $T_{stg}$              | -40°C to +100°C -40°F to +212°F |            |                                    |                         |

# RF SSOP C×R10 Voltage-sensitive (AQY221F○2V)

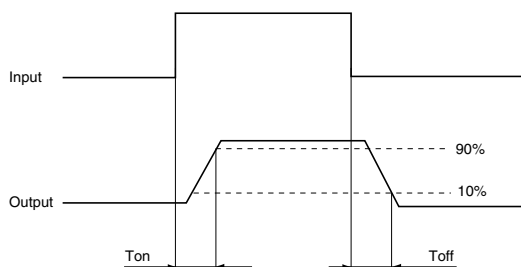
## 2. Electrical characteristics (Condition: ambient temperature 25°C 77°F)

| Item                             |                    | Symbol            | AQY221FR2V          | AQY221FN2V | Condition   |
|----------------------------------|--------------------|-------------------|---------------------|------------|---|
| Input                            | Operate voltage    | Typ.              | 1.3V                |            | AQY221FR2V: I <sub>L</sub> = Max.<br>AQY221FN2V: I <sub>L</sub> = 80mA  |
|                                  |                    | Max.              | 4V                  |            |   |
|                                  | Turn off voltage   | Min.              | 0.8V                |            |   |
|                                  |                    | Typ.              | 1.3V                |            |   |
| Input current                    | Typ.               | I <sub>IN</sub>   | 8.5mA               |            | V <sub>IN</sub> = 5V  |
| Output                           | On resistance      | Typ.              | 0.75Ω               | 9.5Ω       | AQY221FR2V: V <sub>IN</sub> = 5V, I <sub>L</sub> = Max.<br>AQY221FN2V: V <sub>IN</sub> = 5V, I <sub>L</sub> = 80mA<br>Within 1 s on time                            |
|                                  |                    | Max.              | 1.25Ω               | 12.5Ω      |   |
|                                  | Output capacitance | Typ.              | 12.5pF              | 1pF        | V <sub>IN</sub> = 0V, V <sub>B</sub> = 0V, f = 1MHz   |
|                                  |                    | Max.              | 18pF                | 1.5pF      |   |
| Off state leakage current        | Typ.               | I <sub>Leak</sub> | 0.02nA              | 0.01nA     | V <sub>IN</sub> = 0V, V <sub>L</sub> = Max.   |
|                                  | Max.               |                   | 10nA (1nA or less)* |            |   |
| Transfer characteristics         | Turn on time**     | Typ.              | 0.05ms              | 0.01ms     | AQY221FR2V:<br>V <sub>IN</sub> = 5V, V <sub>L</sub> = 10V, R <sub>L</sub> = 40Ω<br>AQY221FN2V:<br>V <sub>IN</sub> = 5V, V <sub>L</sub> = 10V, R <sub>L</sub> = 125Ω |
|                                  |                    | Max.              | 0.5ms               |            |   |
|                                  | Turn off time**    | Typ.              | 0.06ms              | 0.03ms     | f = 1MHz, V <sub>B</sub> = 0V   |
|                                  |                    | Max.              | 0.2ms               |            |   |
|                                  | I/O capacitance    | Typ.              | C <sub>iso</sub>    | 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.               | R <sub>iso</sub>  | 1,000MΩ             |            | 500V DC   |

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

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

\*\*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    |

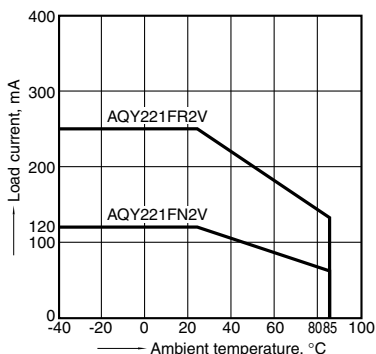
■ These products are not designed for automotive use.

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

## REFERENCE DATA

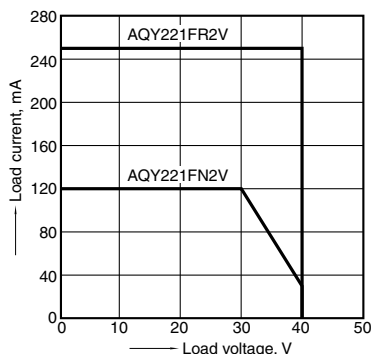
### 1. Load current vs. ambient temperature characteristics

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



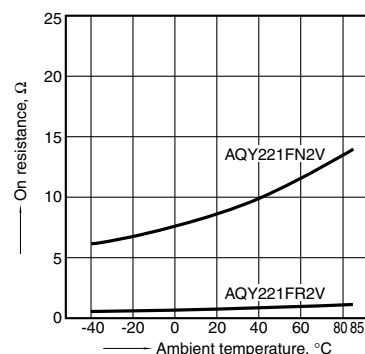
### 2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



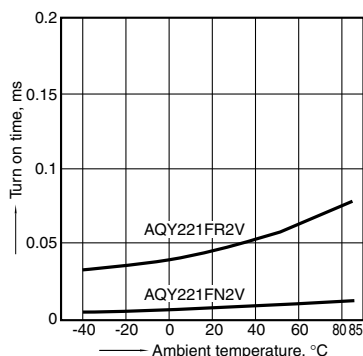
### 3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
Input voltage: 5V; Load voltage: 10V (DC);  
Continuous load current: 80mA (DC)



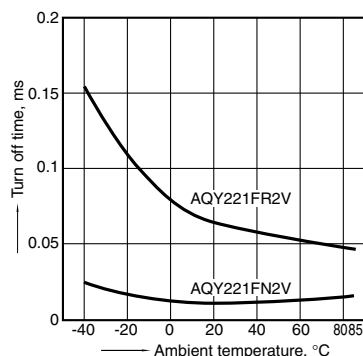
### 4. Turn on time vs. ambient temperature characteristics

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



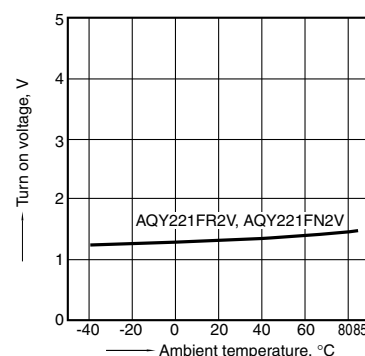
### 5. Turn off time vs. ambient temperature characteristics

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



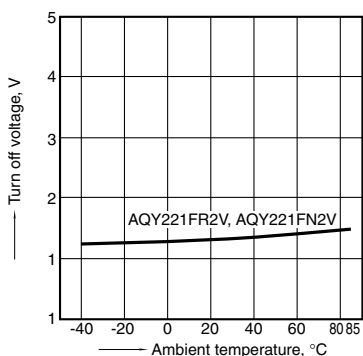
### 6. Turn on voltage vs. ambient temperature characteristics

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



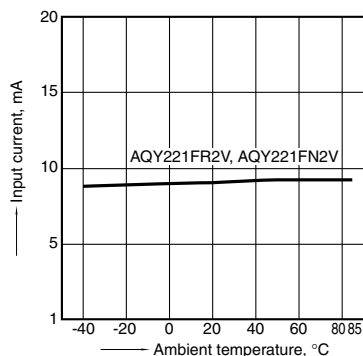
### 7. Turn off voltage vs. ambient temperature characteristics

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



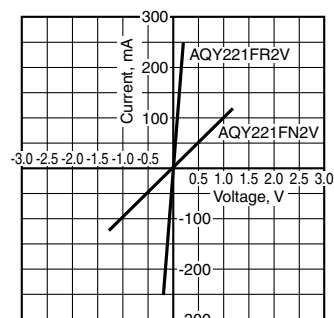
### 8. Input current vs. ambient temperature characteristics

Input voltage: 5V



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

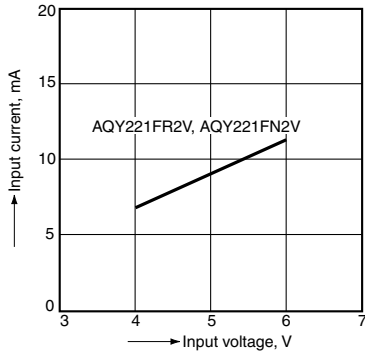
Measured portion: between terminals 3 and 4  
Ambient temperature: 25°C 77°F



# RF SSOP C×R10 Voltage-sensitive (AQY221F○2V)

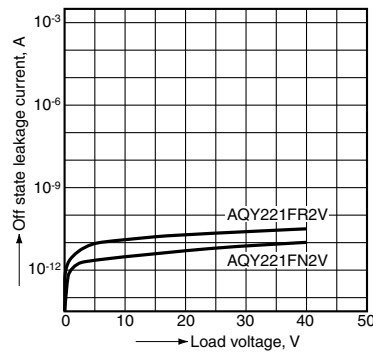
## 10. Input current vs. input voltage characteristics

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



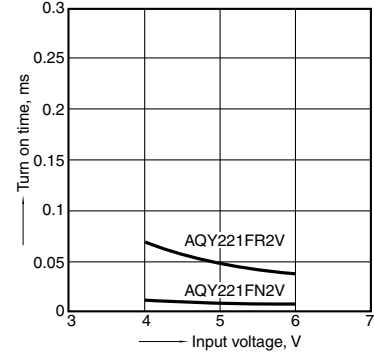
## 11. Off state leakage current vs. load voltage characteristics

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



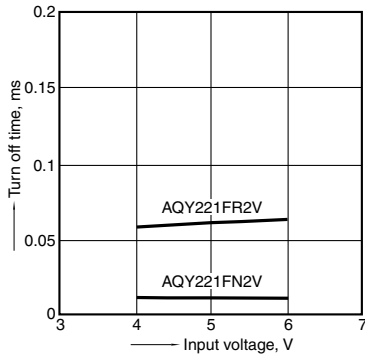
## 12. Turn on time vs. input voltage characteristics

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



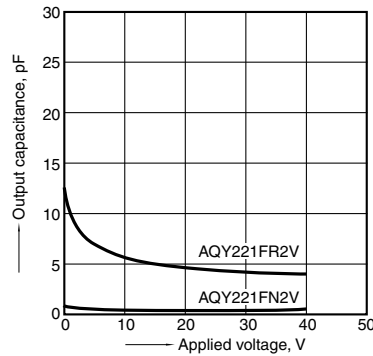
## 13. Turn off time vs. input voltage characteristics

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



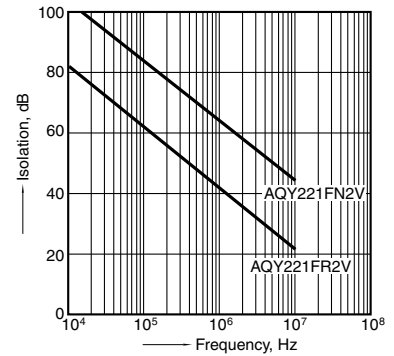
## 14. Output capacitance vs. applied voltage characteristics

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

