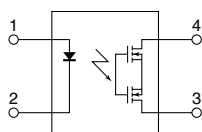


New



mm inch

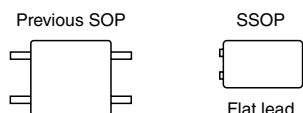


Compliance with RoHS Directive

### FEATURES

#### 1. Micro-miniature package (SSOP) using a new flat lead terminal shape

Compared to previous models (SOP 4-pin), mounting area can be reduced by approximately 56%\*. This contributes to improved output signal transit characteristics.



\*Comparison of area of SSOP and SOP 4-pin (including leads).

#### 2. Full lineup with C×R10

Lineup includes three types with superior electrical performance of C×R10. R type and C type, respectively, feature greatly reduced on resistance and output capacitance.

		On resistance (Typical)	Output capacitance (Typical)
R type	AQY221R4V	0.55Ω	24pF
	AQY221R2V	0.75Ω	12.5pF
C type	AQY221N2V	9.5Ω	1.0pF

### 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

### TYPES

	Type	Output rating*1		Package	Tape and reel packing style*2		Packing quantity in tape and reel
		Load voltage	Load current		Picked from the 1 and 4-pin side	Picked from the 2 and 3-pin side	
AC/DC dual use	Low on-resistance (R type)	New 40 V	500 mA	SSOP	AQY221R4VY	AQY221R4VW	3,500 pcs.
		40 V	250 mA		AQY221R2VY	AQY221R2VW	
	Low capacitance (C type)	40 V	120 mA		AQY221N2VY	AQY221N2VW	

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

\*2 Tape and reel is the standard packing style for SSOP.

For space reasons, the three initial letters of the part number "AQY", the package (SSOP) indication "V", and the packaging style "Y" or "W" are not marked on the relay. (Ex. the label for product number AQY221R4VY is 221R4)

### RATING

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

Item	Symbol	R type		C type	Remarks	
		AQY221R4V	AQY221R2V	AQY221N2V		
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>	0.5A	0.25A	0.12A	Peak AC, DC
	Peak load current	I <sub>peak</sub>	1A	0.75A	0.3A	100ms (1shot), V <sub>L</sub> =DC
	Power dissipation	P <sub>out</sub>	250mW			
Total power dissipation	P <sub>T</sub>	300mW				
I/O isolation voltage	V <sub>iso</sub>	1,500V 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				

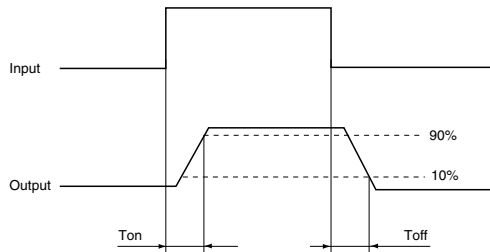
# RF SSOP 1 Form A C×R10 (AQY221○○V)

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

Item		Symbol	R type		C type	Condition	
			AQY221R4V	AQY221R2V	AQY221N2V		
Input	LED operate current	Typical	0.9 mA		1.0 mA	AQY221R4V: I <sub>L</sub> = 500 mA AQY221R2V: I <sub>L</sub> = 250 mA AQY221N2V: I <sub>L</sub> = 80 mA	
		Maximum	3.0 mA				
	LED turn off current	Minimum	0.1 mA		0.2 mA		
		Typical	0.8 mA		0.9 mA		
LED dropout voltage*1	Typical	1.35 V (1.14 V at I <sub>F</sub> = 5 mA)			I <sub>F</sub> = 50 mA		
	Maximum	1.5 V					
Output	On resistance	Typical	0.55Ω	0.75Ω	9.5Ω	AQY221R4V: I <sub>F</sub> = 5 mA, I <sub>L</sub> = 500 mA AQY221R2V: I <sub>F</sub> = 5 mA, I <sub>L</sub> = 250 mA AQY221N2V: I <sub>F</sub> = 5 mA, I <sub>L</sub> = 80 mA Within 1 s on time	
		Maximum	1Ω	1.25Ω	12.5Ω		
	Output capacitance	Typical	24 pF	12.5 pF	1.0 pF		
		Maximum	30 pF	18 pF	1.5 pF		
Off state leakage current	Typical	0.02 nA			0.01 nA	I <sub>F</sub> = 0 mA, V <sub>L</sub> = Max.	
	Maximum	10 nA					
Transfer characteristics	Turn on time*2	Typical	0.25 ms	0.10 ms	0.20 ms	AQY221R4V: I <sub>F</sub> = 5 mA, V <sub>L</sub> = 10 V, R <sub>L</sub> = 20Ω AQY221R2V: I <sub>F</sub> = 5 mA, V <sub>L</sub> = 10 V, R <sub>L</sub> = 40Ω AQY221N2V: I <sub>F</sub> = 5 mA, V <sub>L</sub> = 10 V, R <sub>L</sub> = 125Ω	
		Maximum	0.75 ms	0.5 ms			
	Turn off time*2	Typical	0.08 ms				0.02 ms
		Maximum	0.2 ms				
	I/O capacitance	Typical	0.8 pF				f = 1 MHz, V <sub>B</sub> = 0 V
		Maximum	1.5 pF				
Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000 MΩ		500 V DC		

Note: Variation possible through combinations of output capacitance and on resistance. For more information, please contact our sales office in your area.

\*Turn on/Turn off time



## RECOMMENDED OPERATING CONDITIONS

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

Item	Symbol	Recommended value	Unit
Input LED current	I <sub>F</sub>	5	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 Electric Works technical representative.

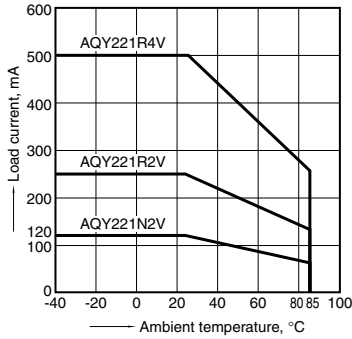
For more information.

# RF SSOP 1 Form A C×R10 (AQY221○○V)

## REFERENCE DATA

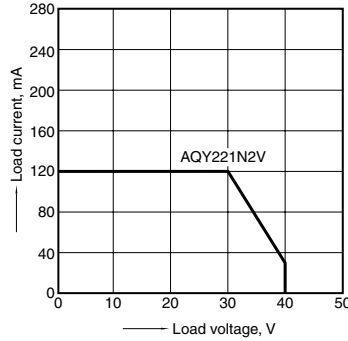
### 1. Load current vs. ambient temperature characteristics

Allowable ambient temperature:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$   
 $-40^{\circ}\text{F}$  to  $+185^{\circ}\text{F}$



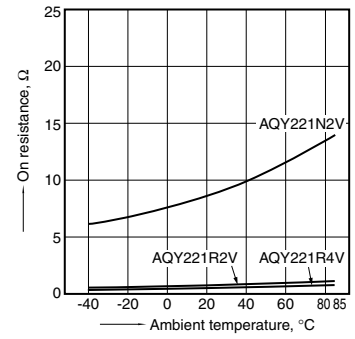
### 2. Load current vs. Load voltage characteristics

Ambient temperature:  $25^{\circ}\text{C}$   $77^{\circ}\text{F}$



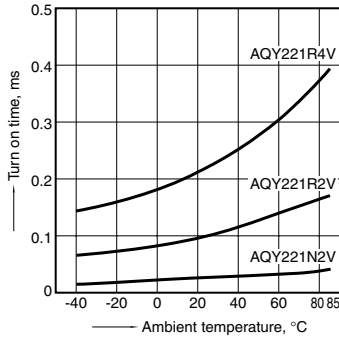
### 3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
 LED current: 5 mA; Load voltage: 10V (DC)  
 Continuous load current: AQY221R4V 500mA (DC), AQY221R2V 250mA (DC), AQY221N2V 80mA (DC)



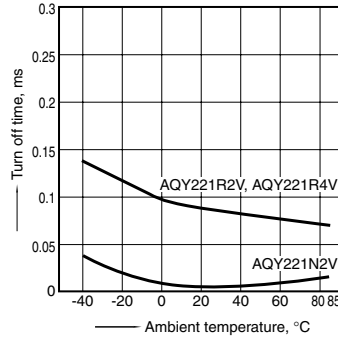
### 4. Turn on time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
 LED current: 5 mA; Load voltage: 10V (DC)  
 Continuous load current: AQY221R4V 500mA (DC), AQY221R2V 250mA (DC), AQY221N2V 80mA (DC)



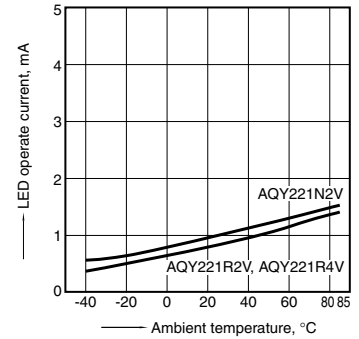
### 5. Turn off time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
 LED current: 5 mA; Load voltage: 10V (DC)  
 Continuous load current: AQY221R4V 500mA (DC), AQY221R2V 250mA (DC), AQY221N2V 80mA (DC)



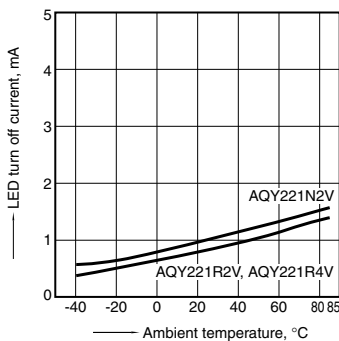
### 6. LED operate current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
 Load voltage: 10V (DC)  
 Continuous load current: AQY221R4V 500mA (DC), AQY221R2V 250mA (DC), AQY221N2V 80mA (DC)



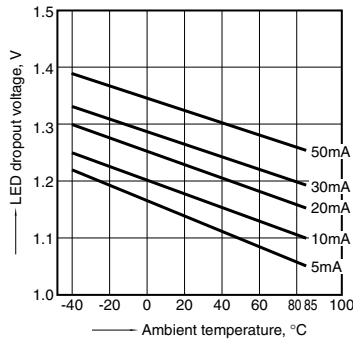
### 7. LED turn off current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
 Load voltage: 10V (DC)  
 Continuous load current: AQY221R4V 500mA (DC), AQY221R2V 250mA (DC), AQY221N2V 80mA (DC)



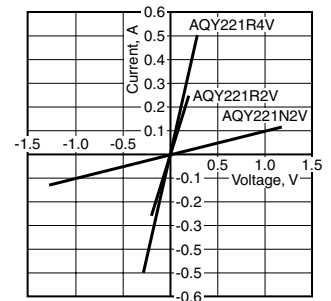
### 8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



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

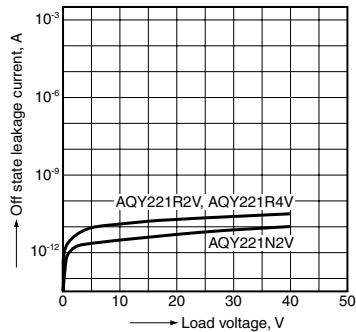
Measured portion: between terminals 3 and 4  
 Ambient temperature:  $25^{\circ}\text{C}$   $77^{\circ}\text{F}$



# RF SSOP 1 Form A C×R10 (AQY221○○V)

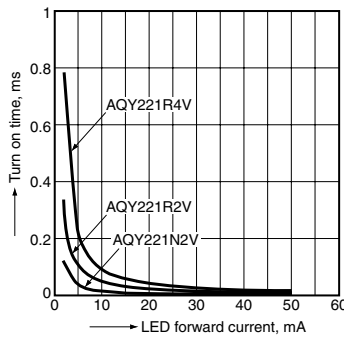
## 10. Off state leakage current vs. load voltage characteristics

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



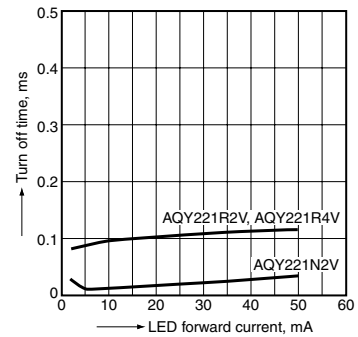
## 11. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)  
Continuous load current: AQY221R4V 500mA (DC), AQY221R2V 250mA (DC), AQY221N2V 80mA (DC)  
Ambient temperature: 25°C 77°F



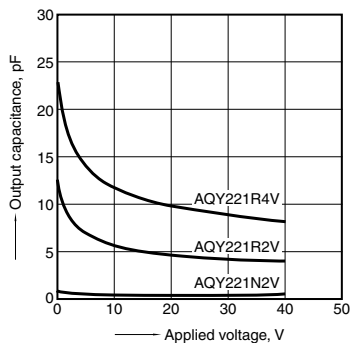
## 12. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)  
Continuous load current: AQY221R4V 500mA (DC), AQY221R2V 250mA (DC), AQY221N2V 80mA (DC)  
Ambient temperature: 25°C 77°F



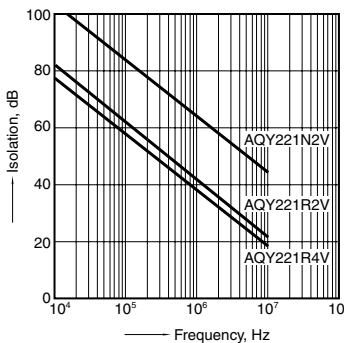
## 13. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 3 and 4  
Frequency: 1 MHz, 30m Vrms  
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

