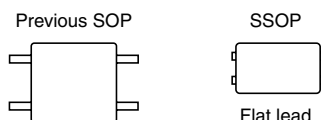


**RoHS compliant**

## FEATURES

### 1. Miniature package (SSOP) using a new flat lead terminal shape

Compared to previous models (SOP 4-pin), mounting area can be reduced by approximately 53%\*. This contributes to improved output signal transit characteristics.



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

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

		On resistance (Typical)	Output capacitance (Typical)
C×R10 R type	<b>New</b> AQY221R6V	0.18Ω	37.5pF
	AQY221R4V	0.55Ω	24pF
	AQY221R2V	0.75Ω	12.5pF
C×R10 C type	AQY221N2V	9.5Ω	1.0pF
C×R5	AQY221N3V	5.5Ω	1.0pF

## 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	C×R10	Low on-resistance (R type)	30 V	1,000 mA	SSOP	AQY221R6VY	AQY221R6VW	3,500 pcs.	
			40 V	500 mA		AQY221R4VY	AQY221R4VW		
			40 V	250 mA		AQY221R2VY	AQY221R2VW		
		Low capacitance (C type)	40 V	120 mA		AQY221N2VY	AQY221N2VW		
	C×R5		25 V	150 mA		AQY221N3VY	AQY221N3VW		

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

\*2. Tape and reel is the standard packing style for SSOP. Packing quantity of 1,000 pieces is possible. Please consult us.

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 device. (Ex. the label for product number AQY221R4VY is 221R4)

## RATING

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

Item	Symbol	C×R10 R type			C×R10 C type	C×R5	Remarks
		AQY221R6V	AQY221R4V	AQY221R2V	AQY221N2V	AQY221N3V	
Input	LED forward current	50mA					
	LED reverse voltage	5V					
	Peak forward current	1A					f=100 Hz, Duty factor=0.1%
	Power dissipation	75mW					
Output	Load voltage (peak AC)	30V	40V			25V	
	Continuous load current	1A	0.5A	0.25A	0.12A	0.15A	Peak AC, DC
	Peak load current	1.5A	1A	0.75A	0.3A	0.4A	100ms (1shot), V <sub>L</sub> =DC
	Power dissipation	250mW					
	Total power dissipation	300mW					
I/O isolation voltage		1,500V AC					
Operating temperature		-40°C to +85°C -40°F to +185°F					Non-condensing at low temperatures
Storage temperature		-40°C to +100°C -40°F to +212°F					

# RF SSOP 1 Form A C×R10/C×R5 (AQY221○○V)

## 2. Electrical characteristics (Ambient temperature: 2

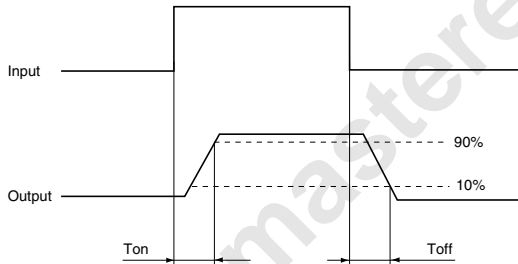


Item			Symbol	C×R10 R type			C×R10 C type	C×R5	Condition
				AQY221R6V	AQY221R4V	AQY221R2V	AQY221N2V	AQY221N3V	
Input	LED operate current	Typical	$I_{Fon}$	0.7 mA	0.9 mA		1.0 mA		AQY221R6V: $I_L = 100$ mA AQY221R4V: $I_L = 500$ mA AQY221R2V: $I_L = 250$ mA AQY221N2V: $I_L = 80$ mA AQY221N3V: $I_L = 80$ mA
		Maximum		3.0 mA					
	LED turn off current	Minimum	$I_{Foff}$	0.1 mA			0.2 mA		
		Typical		0.6 mA	0.8 mA		0.9 mA		
Output	LED dropout voltage*1	Typical	$V_F$	1.35 V (1.14 V at $I_F = 5$ mA)					$I_F = 50$ mA
		Maximum		1.5 V					
	On resistance	Typical	$R_{on}$	0.18Ω	0.55Ω	0.75Ω	9.5Ω	5.5Ω	
		Maximum		0.35Ω	1Ω	1.25Ω	12.5Ω	7.5Ω	
Transfer characteristics	Output capacitance	Typical	$C_{out}$	37.5 pF	24 pF	12.5 pF	1.0 pF		$I_F = 0$ mA, $V_B = 0$ V, $f = 1$ MHz
		Maximum		100 pF	30 pF	18 pF	1.5 pF		
	Off state leakage current	Typical	$I_{Leak}$	—	0.02 nA		0.01 nA		
		Maximum		10 nA					
Transfer characteristics	Turn on time	Typical	$T_{on}$	0.2 ms	0.25 ms	0.10 ms	0.02 ms		AQY221R6V: $I_F = 5$ mA, $V_L = 10$ V, $R_L = 100\Omega$ AQY221R4V: $I_F = 5$ mA, $V_L = 10$ V, $R_L = 20\Omega$ AQY221R2V: $I_F = 5$ mA, $V_L = 10$ V, $R_L = 40\Omega$ AQY221N2V: $I_F = 5$ mA, $V_L = 10$ V, $R_L = 125\Omega$ AQY221N3V: $I_F = 5$ mA, $V_L = 10$ V, $R_L = 125\Omega$
		Maximum		0.5 ms	0.75 ms	0.5 ms	0.2 ms		
	Turn off time	Typical	$T_{off}$	0.07 ms	0.08 ms		0.02 ms		
		Maximum		0.2 ms	0.2 ms				
	I/O capacitance	Typical	$C_{iso}$	0.8 pF					
		Maximum		1.5 pF					
Transfer characteristics	Initial I/O isolation resistance	Minimum	$R_{iso}$	1,000 MΩ					500 V DC

Notes: 1. Please refer to the "Schematic and Wiring Diagrams" for connection method.

2. 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 device operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	$I_F$	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 Corporation technical representative.

For more information.

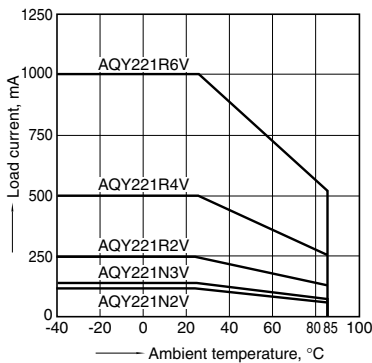
# RF SSOP 1 Form A C×R10/C×R5 (AQY221○○V)

## REFERENCE DATA



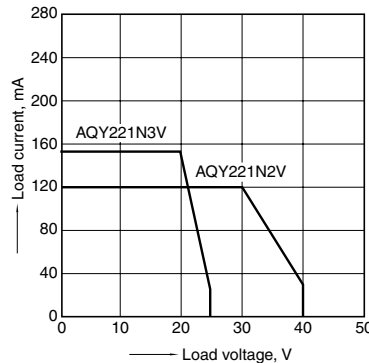
### 1. Load current vs. ambient temperature characteristics

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



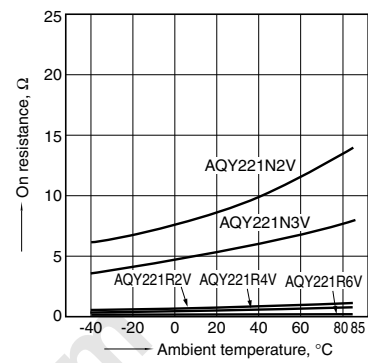
### 2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



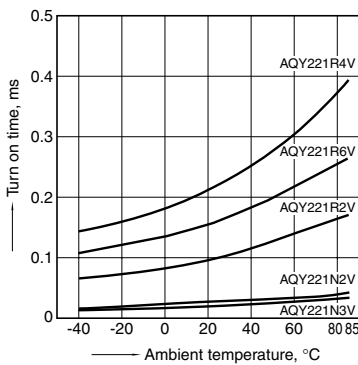
### 3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
LED current: 5 mA; Load voltage: 10V (DC)  
Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V



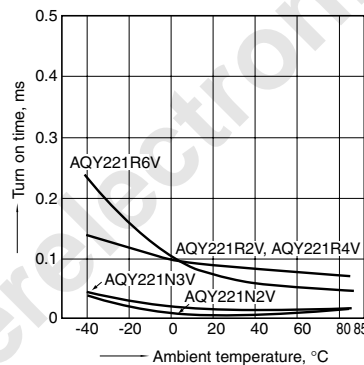
### 4. Turn on time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
LED current: 5 mA; Load voltage: 10V (DC)  
Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V



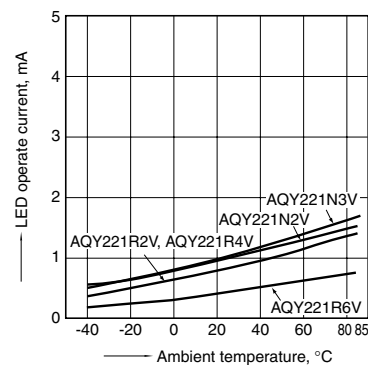
### 5. Turn off time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
LED current: 5 mA; Load voltage: 10V (DC)  
Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V



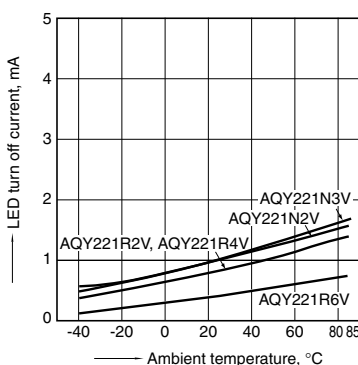
### 6. LED operate current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)  
Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V



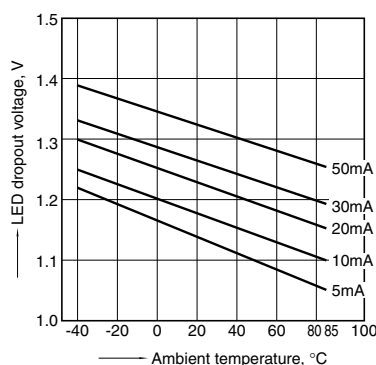
### 7. LED turn off current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)  
Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V



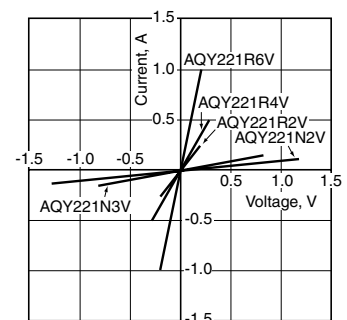
### 8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



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

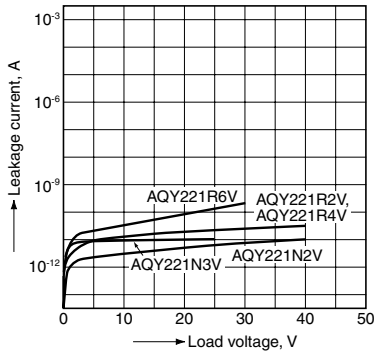
Measured portion: between terminals 3 and 4  
Ambient temperature: 25°C 77°F



# RF SSOP 1 Form A C×R10/C×R5 (AQY221○○V)

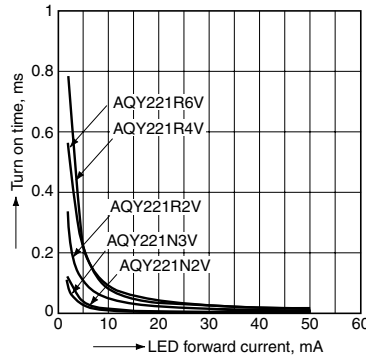
## 10. Off state leakage current vs. load voltage characteristics

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



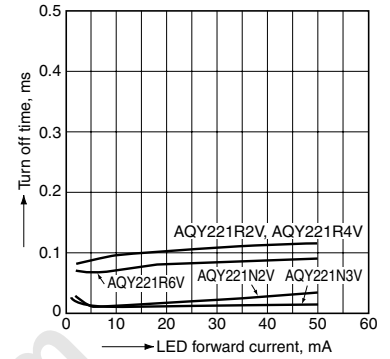
## 11. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)  
Continuous load current: 100mA (DC) AQY221R6V, 500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V, 80mA (DC) AQY221N2V, AQY221N3V  
Ambient temperature: 25°C 77°F



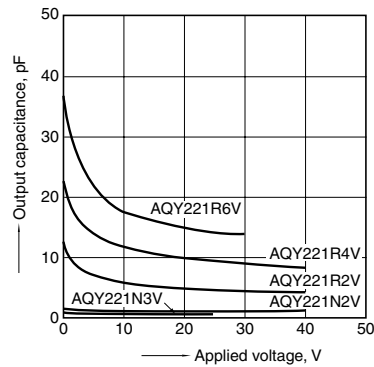
## 12. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)  
Continuous load current: 100mA (DC) AQY221R6V, 500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V, 80mA (DC) AQY221N2V, AQY221N3V  
Ambient temperature: 25°C 77°F



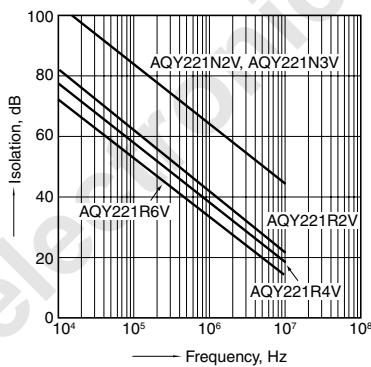
## 13. Output capacitance vs. applied voltage characteristics

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

