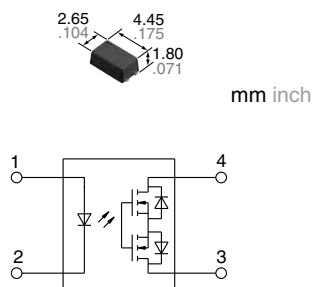


**Miniature SSOP**  
**C×R10: 30 V/40 V load**  
**voltage**  
**C×R5: 25 V load voltage**

**PhotoMOS®**  
**RF SSOP 1 Form A C×R10/C×R5**  
**(AQY22○○○V)**

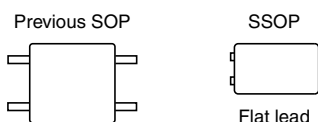


**RoHS compliant**

### 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	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

### 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**
- 4. Multi-point recorder**  
Data logger, Warping and Thermocouple, etc.

### 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	I <sub>F</sub>	50mA					f=100 Hz, Duty factor=0.1%
	LED reverse voltage	V <sub>R</sub>	5V					
	Peak forward current	I <sub>FP</sub>	1A					
	Power dissipation	P <sub>in</sub>	75mW					
Output	Load voltage (peak AC)	V <sub>L</sub>	30V	40V			25V	Peak AC, DC 100ms (1shot), V <sub>L</sub> =DC
	Continuous load current	I <sub>L</sub>	1A	0.5A	0.25A	0.12A	0.15A	
	Peak load current	I <sub>peak</sub>	1.5A	1A	0.75A	0.3A	0.4A	
	Power dissipation	P <sub>out</sub>	250mW					
Total power dissipation		P <sub>T</sub>	300mW					
I/O isolation voltage		V <sub>iso</sub>	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					

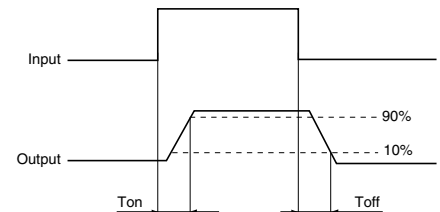
### 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	C×R10 R type			C×R10 C type	C×R5	Condition		
				AQY221R6V	AQY221R4V	AQY221R2V	AQY221N2V	AQY221N3V			
Input	LED operate current	Typical	I <sub>Fon</sub>	0.7 mA	0.9 mA		1.0 mA		AQY221R6V: I <sub>L</sub> = 100 mA AQY221R4V: I <sub>L</sub> = 500 mA AQY221R2V: I <sub>L</sub> = 250 mA AQY221N2V: I <sub>L</sub> = 80 mA AQY221N3V: I <sub>L</sub> = 80 mA		
		Maximum		3.0 mA							
	LED turn off current	Minimum	I <sub>Foff</sub>	0.1 mA			0.2 mA				
		Typical		0.6 mA	0.8 mA		0.9 mA				
	LED dropout voltage	Typical	V <sub>F</sub>	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	R <sub>on</sub>	0.18Ω	0.55Ω	0.75Ω	9.5Ω	5.5Ω	AQY221R6V: I <sub>F</sub> = 5 mA, I <sub>L</sub> = 1000 mA 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 AQY221N3V: I <sub>F</sub> = 5 mA, I <sub>L</sub> = 80 mA Within 1 s		
		Maximum		0.35Ω	1Ω	1.25Ω	12.5Ω	7.5Ω			
	Output capacitance	Typical	C <sub>out</sub>	37.5 pF	24 pF	12.5 pF	1.0 pF			I <sub>F</sub> = 0 mA, V <sub>B</sub> = 0 V, f = 1 MHz	
		Maximum		100 pF	30 pF	18 pF	1.5 pF				
	Off state leakage current	Typical	I <sub>Leak</sub>	—	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**	Typical	T <sub>on</sub>	0.2 ms	0.25 ms	0.10 ms	0.02 ms		AQY221R6V: I <sub>F</sub> = 5 mA, V <sub>L</sub> = 10 V, R <sub>L</sub> = 100Ω 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 AQY221N3V: I <sub>F</sub> = 5 mA, V <sub>L</sub> = 10 V, R <sub>L</sub> = 125Ω		
		Maximum		0.5 ms	0.75 ms	0.5 ms		0.2 ms			
	Turn off time**	Typical	T <sub>off</sub>	0.07 ms	0.08 ms		0.02 ms				
		Maximum		0.2 ms							
	I/O capacitance	Typical	C <sub>iso</sub>	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.

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

\*\*Turn on/Turn off time



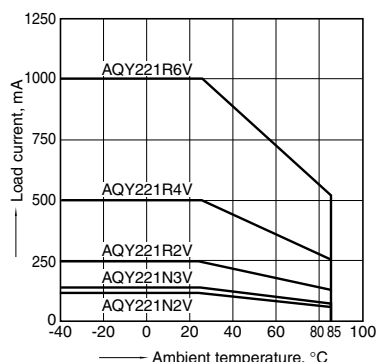
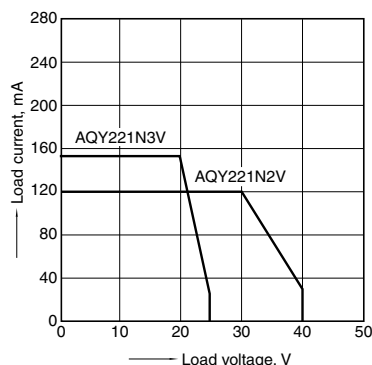
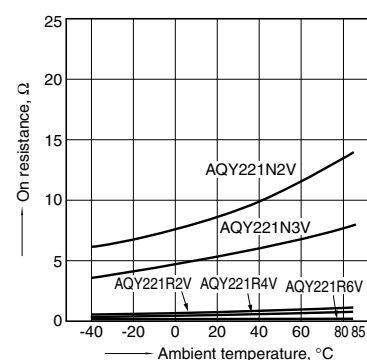
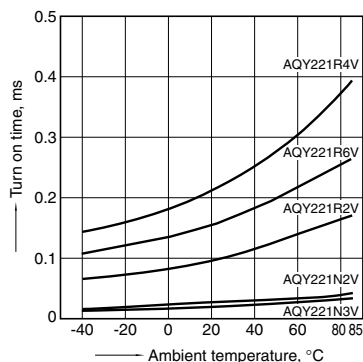
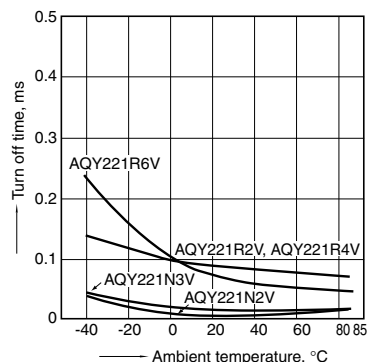
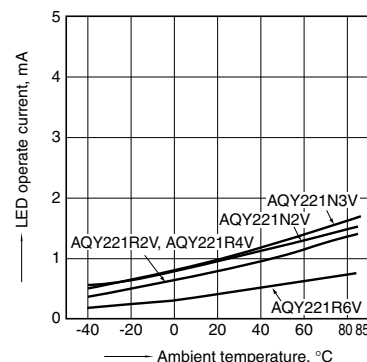
**3. Recommended operating conditions** (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

Item		Symbol	Min.	Max.	Unit
LED current		I <sub>F</sub>	5	30	mA
AQY221R6V	Load voltage (Peak AC)	V <sub>L</sub>	—	15	V
	Continuous load current	I <sub>L</sub>	—	1	A
AQY221R4V	Load voltage (Peak AC)	V <sub>L</sub>	—	15	V
	Continuous load current	I <sub>L</sub>	—	0.5	A
AQY221R2V	Load voltage (Peak AC)	V <sub>L</sub>	—	15	V
	Continuous load current	I <sub>L</sub>	—	0.25	A
AQY221N2V	Load voltage (Peak AC)	V <sub>L</sub>	—	15	V
	Continuous load current	I <sub>L</sub>	—	0.12	A
AQY221N3V	Load voltage (Peak AC)	V <sub>L</sub>	—	15	V
	Continuous load current	I <sub>L</sub>	—	0.15	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.

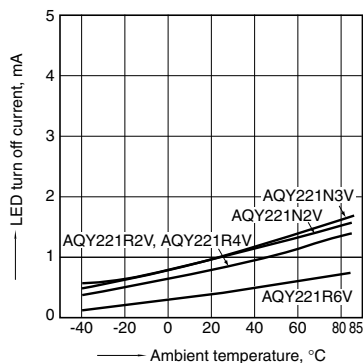
**REFERENCE DATA****1. Load current vs. ambient temperature characteristics**Allowable ambient temperature: -40 to +85°C  
-40 to +185°F**2. Load current vs. Load voltage characteristics**  
Ambient temperature: 25°C 77°F**3. On resistance vs. ambient temperature characteristics**Measured portion: between terminals 3 and 4  
LED current: 5 mA; Load voltage: 10V (DC)  
Continuous load current: 1000mA (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

# RF SSOP 1 Form A C×R10/C×R5 (AQY22○○○V)

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

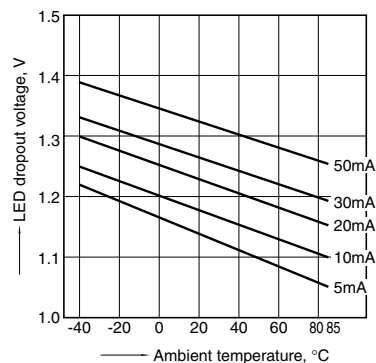
Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)

Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V



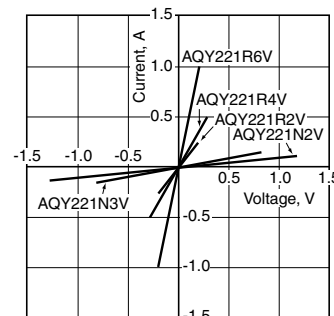
## 8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



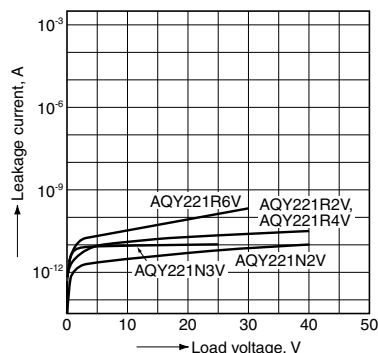
## 9. Current vs. voltage characteristics of output at MOS portion

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



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

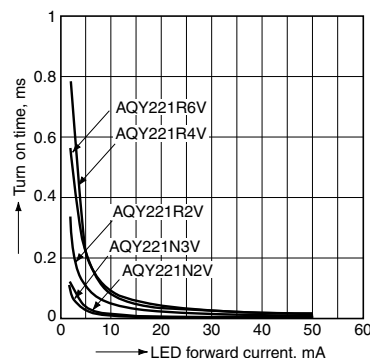
Measured portion: between terminals 3 and 4  
Ambient temperature: 25°C 77°F



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

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)

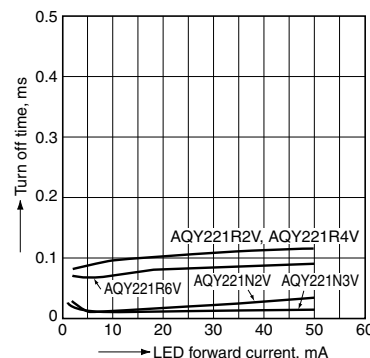
Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V  
Ambient temperature: 25°C 77°F



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

Measured portion: between terminals 3 and 4  
Load voltage: 10V (DC)

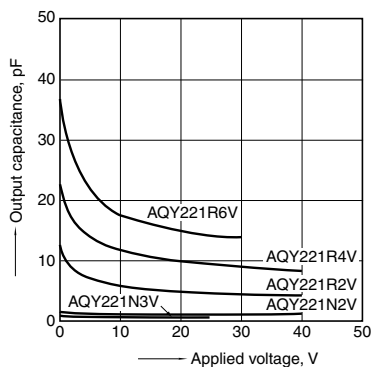
Continuous load current: 100mA (DC) AQY221R6V,  
500mA (DC) AQY221R4V, 250mA (DC) AQY221R2V,  
80mA (DC) AQY221N2V, AQY221N3V  
Ambient temperature: 25°C 77°F



## 13. Output capacitance vs. applied voltage characteristics

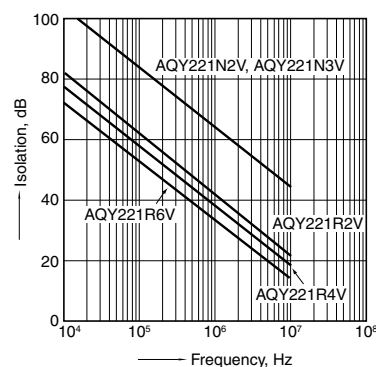
Measured portion: between terminals 3 and 4  
Frequency: 1 MHz, 30mVrms

Ambient temperature: 25°C 77°F



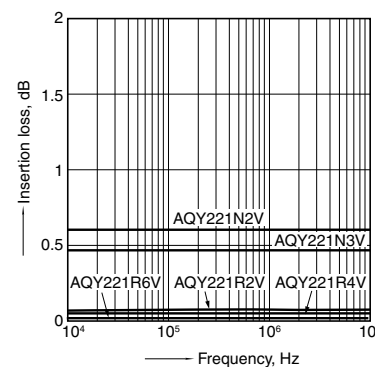
## 14. Isolation vs. frequency characteristics (50Ω impedance)

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:

[AQY221N3V1Y](#) [AQY221N2V1Y](#) [AQY221R4V](#) [AQY221N2V](#) [AQY221R2V](#) [AQY221N2V1W](#) [AQY221R6V](#)  
[AQY221R2V1Y](#) [AQY221R4V1Y](#) [AQY221R4V1W](#)