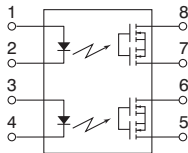


**CAD Data**

mm inch



## FEATURES

**1. 2-channels (Form A) type with high response speed, low leakage current and low on-resistance.**

**2. Applicable for 2 Form A use as well as two independent 1 Form A use**

**3. Low capacitance between output terminals ensures high response speed:**

The capacitance between output terminals is small; typ. 10 pF.

This enables for a fast operation speed of typ. 0.2 ms.

**4. High sensitivity and low on-resistance:**

Max. 0.07 A of load current can be controlled with input current of 5 mA.

The on-resistance is less than our conventional models.

**5. Low-level off state leakage current**

**6. Controls low-level analog signals:**

PhotoMOS relay features extremely low closed-circuit offset voltages to enable control of small analog signals without distortion.

## TYPICAL APPLICATIONS

• **Measuring instruments**

Scanner, IC checker, Board tester, etc.

## TYPES

	Output rating*		Package	Part No.				Packing quantity	
				Through hole terminal	Surface-mount terminal			Tube	Tape and reel
	Load voltage	Load current		Tube packing style		Tape and reel packing style			
				Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side				
AC/DC dual use	200 V	50 mA	DIP8-pin	AQW227N	AQW227NA	AQW227NAX	AQW227NAZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs.
	400 V	40 mA		AQW224N	AQW224NA	AQW224NAX	AQW224NAZ		

\*Indicate the peak AC and DC values.

Note: The surface mount terminal indicator "A" and the packing style indicator "X" or "Z" are not marked on the relay.

## RATING

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

Item		Symbol	AQW227N(A)	AQW224N(A)	Remarks
Input	LED forward current	I <sub>F</sub>	50 mA		
	LED reverse voltage	V <sub>R</sub>	5 V		
	Peak forward current	I <sub>FP</sub>	1 A		f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75 mW		
Output	Load voltage (peak AC)	V <sub>L</sub>	200 V	400 V	
	Continuous load current	I <sub>L</sub>	0.05 A (0.07 A)	0.04 A (0.05 A)	Peak AC, DC ( ): in case of using only 1 channel
	Peak load current	I <sub>peak</sub>	0.15 A	0.12 A	A connection: 100 ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	800 mW		
Total power dissipation		P <sub>T</sub>	850 mW		
I/O isolation voltage		V <sub>iso</sub>	1,500 V AC		
Temperature limits	Operating	T <sub>opr</sub>	-40°C to +85°C -40°F to +185°F		Non-condensing at low temperatures
	Storage	T <sub>stg</sub>	-40°C to +100°C -40°F to +212°F		

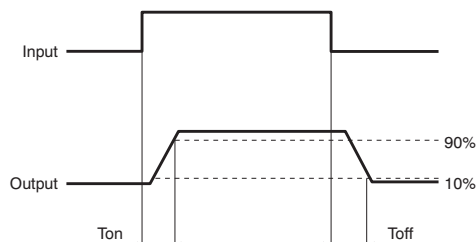
# RF 2 Form A Low on-resistance (AQW220N)

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

Item		Symbol	AQW227N(A)	AQW224N(A)	Remarks
Input	LED operate current	Typical	0.9 mA		I <sub>L</sub> = Max.
		Maximum	3.0 mA		
	LED turn off current	Minimum	0.4 mA		I <sub>L</sub> = Max.
		Typical	0.8 mA		
LED dropout voltage	Typical	1.25 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	30 Ω	70 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s on time
		Maximum	50 Ω	100 Ω	
	Output capacitance	Typical	10 pF		I <sub>F</sub> = 0 V <sub>B</sub> = 0 f = 1 MHz
		Maximum	15 pF		
Off state leakage current	Maximum	10 nA (1 nA or less)*		I <sub>F</sub> = 0 V <sub>L</sub> = Max.	
Transfer characteristics	Turn on time*	Typical	0.2 ms		I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum	0.5 ms		
	Turn off time*	Typical	0.08 ms		I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum	0.2 ms		
	I/O capacitance	Typical	0.8 pF		f = 1 MHz V <sub>B</sub> = 0
		Maximum	1.5 pF		
Initial I/O isolation resistance	Minimum	1,000 MΩ		500 V DC	

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

\*\*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

### ■ Dimensions

### ■ Schematic and Wiring Diagrams

### ■ 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 technical representative.

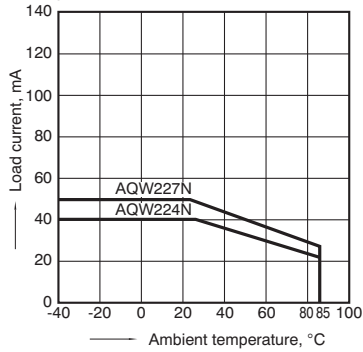
Please refer to our information on [PhotoMOS Relays for Automotive Applications](#).

## REFERENCE DATA

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

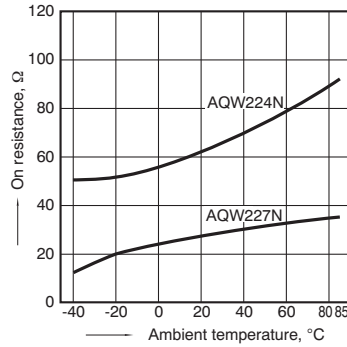
Allowable ambient temperature:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$   
 $-40^{\circ}\text{F}$  to  $+185^{\circ}\text{F}$

When using 2 channels



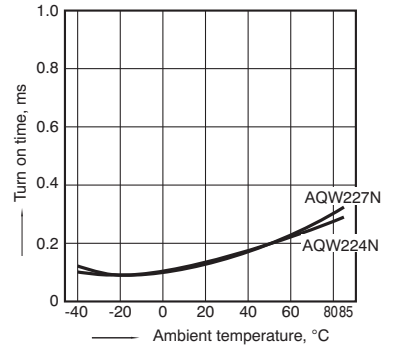
### 2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8; LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



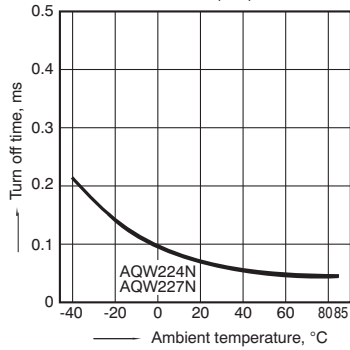
### 3. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



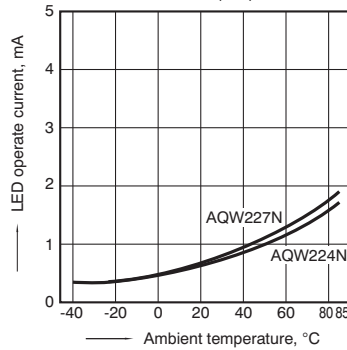
### 4. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



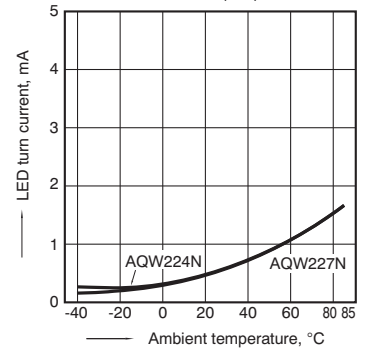
### 5. LED operate current vs. ambient temperature characteristics

Load voltage: Max. (DC); Continuous load current: Max. (DC)



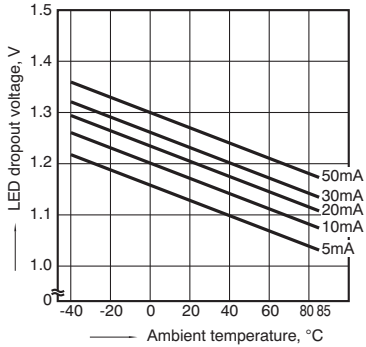
### 6. LED turn off current vs. ambient temperature characteristics

Load voltage: Max. (DC); Continuous load current: Max. (DC)



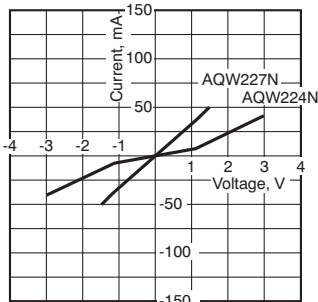
### 7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types;  
LED current: 5 to 50 mA



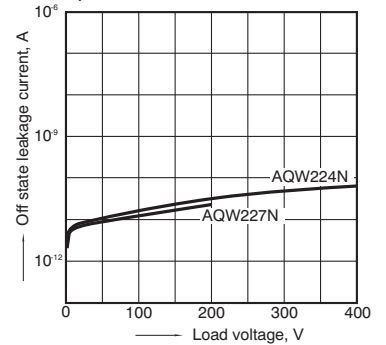
### 8. Voltage vs. current characteristics of output at MOS portion

Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature:  $25^{\circ}\text{C}$   $77^{\circ}\text{F}$



### 9. Off state leakage current

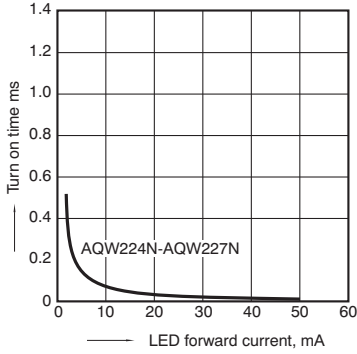
Measured portion: between terminals 5 and 6, 7 and 8;  
Ambient temperature:  $25^{\circ}\text{C}$   $77^{\circ}\text{F}$



# RF 2 Form A Low on-resistance (AQW220N)

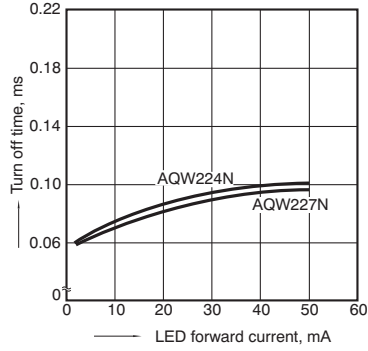
## 10. LED forward current vs. turn on time characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



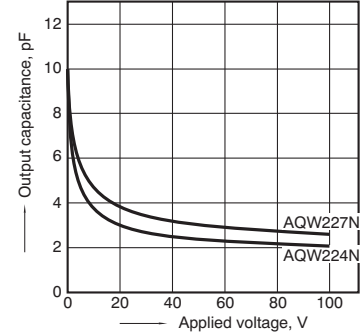
## 11. LED forward current vs. turn off time characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



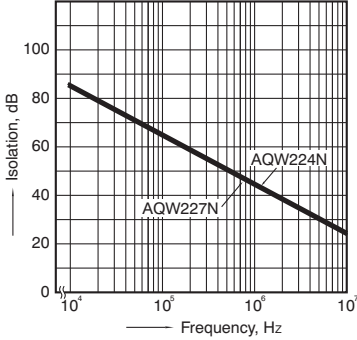
## 12. Applied voltage vs. output capacitance characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Frequency: 1 MHz, 30 mVrms; Ambient temperature: 25°C 77°F



## 13. Isolation characteristics (50 Ω impedance)

Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



## 14. Insertion loss characteristics (50 Ω impedance)

Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F

