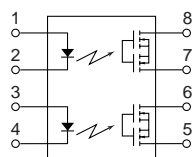
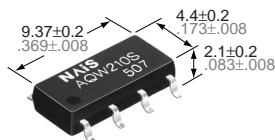


# NAIS

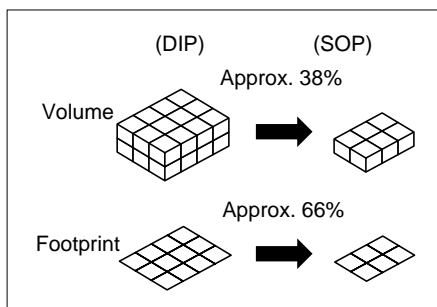
## GU (General Use) Type SOP Series [2-Channel (Form A) Type]

# PhotoMOS RELAYS



mm inch

× (H) 2.1 mm (W) .173× (L) .369× (H) .083 inch —approx. 38% of the volume and 66% of the footprint size of DIP type PhotoMOS Relays.



**3. Controls low-level analog signals**  
PhotoMOS relays feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

**4. Low-level off state leakage current**  
In contrast to the SSR with an off state leakage current of several milliamps, the PhotoMOS relay features a very small off state leakage current of only 100 pA even with the rated load voltage of 400 V (AQW214S)

## FEATURES

### 1. 2 channels in super miniature design

The device comes in a super-miniature SO package measuring (W) 4.4 × (L) 9.37

### 2. Tape and reel

The device comes standard in a tape and reel (1,000 pcs./reel) to facilitate automatic insertion machines.

## TYPICAL APPLICATIONS

- Telephones
- Measuring instruments
- Computer
- Industrial robots
- High-speed inspection machines.

## TYPES

Type	Output rating*		Part No.		Packing quantity in tape and reel
	Load voltage	Load current	Picked from the 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side	
AC/DC	350 V	100 mA	AQW210SX	AQW210SZ	1,000 pcs.
	400 V	80 mA	AQW214SX	AQW214SZ	

\*Indicate the peak AC and DC values.

Notes: (1) Tape package is the standard packing style. Also available in tube. (Part No. suffix "X" or "Z" is not needed when ordering; Tube: 50 pcs.; Case: 1,000 pcs.)

(2) For space reasons, the package type indicator "X" and "Z" are omitted from the seal.

## RATING

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

Item		Symbol	AQW210S	AQW214S	Remarks
Input	LED forward current	I <sub>F</sub>	50 mA	50 mA	
	LED reverse voltage	V <sub>R</sub>	3 V	3 V	
	Peak forward current	I <sub>FP</sub>	1 A	1 A	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75 mW	75 mW	
Output	Load voltage (peak AC)	V <sub>L</sub>	350 V	400 V	
	Continuous load current	I <sub>L</sub>	0.1 A (0.13 A)	0.08 A (0.1 A)	( ) : in case of using only 1 channel Peak AC, DC
	Peak load current	I <sub>peak</sub>	0.3 A	0.24 A	A connection: 100 ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	600 mW	600 mW	
Total power dissipation		P <sub>T</sub>	650 mW	650 mW	
I/O isolation voltage		V <sub>iso</sub>	1,500 V AC	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		

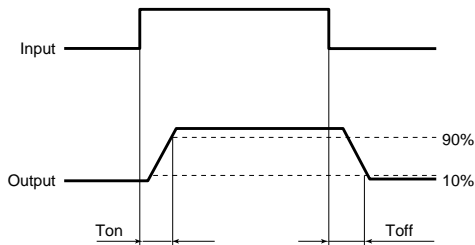
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item		Symbol	AQW210S	AQW214S	Remarks
Input	LED operate current	Typical	0.9 mA		I <sub>L</sub> = Max.
		Maximum	3 mA		
	LED turn off current	Minimum	0.4 mA		I <sub>L</sub> = Max.
		Typical	0.8 mA		
LED dropout voltage	Typical	1.14 V (1.25 V at I <sub>F</sub> = 50 mA)		I <sub>F</sub> = 5 mA	
	Maximum	1.5 V			
Output	On resistance	Typical	16 Ω	30 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s on time
		Maximum	35 Ω	50 Ω	
	Off state leakage current	Maximum	1 μA		I <sub>F</sub> = 0 V <sub>L</sub> = Max.
Transfer characteristics	Turn on time*	Typical	0.23 ms	0.21 ms	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum	0.5 ms		
	Turn off time*	Typical	0.04 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	R <sub>iso</sub>	1,000 MΩ		500 V DC

Note: Recommendable LED forward current I<sub>F</sub> = 5 mA.

For type of connection, see page 32.

\*Turn on/ Turn off time

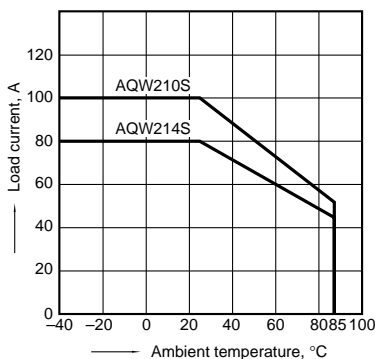


- For Dimensions, see Page 28.
- For Schematic and Wiring Diagrams, see Page 32.
- For Cautions for Use, see Page 36.

REFERENCE DATA

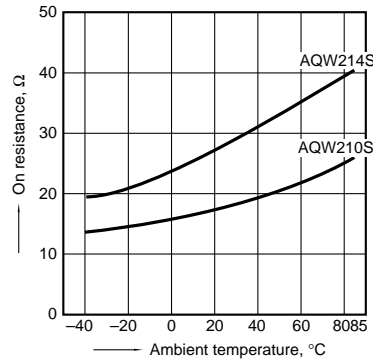
1. Load current vs. ambient temperature characteristics

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



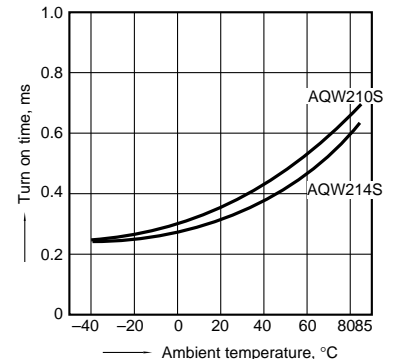
2. On resistance vs. ambient temperature characteristics

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

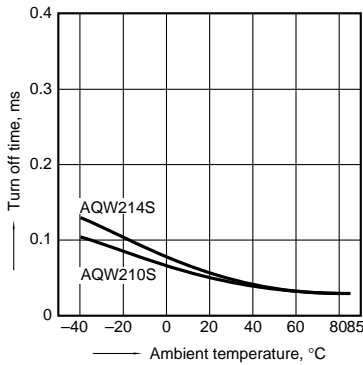
LED current: 5 mA;  
Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



# AQW210S

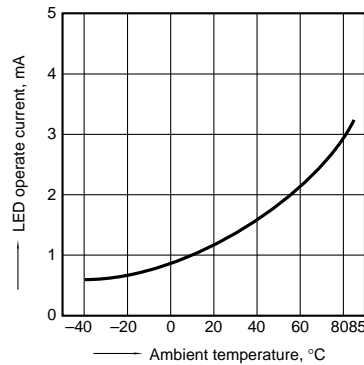
## 4. Turn off time vs. ambient temperature characteristics

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



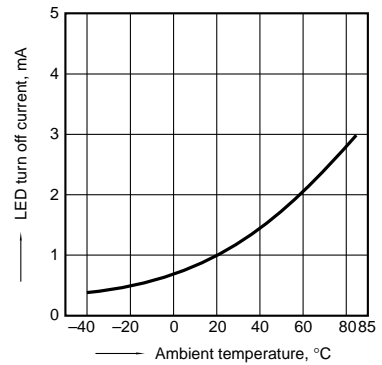
## 5. LED operate current vs. ambient temperature characteristics

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



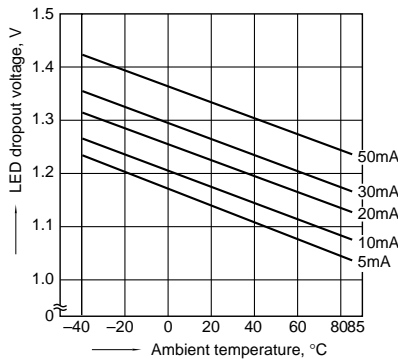
## 6. LED turn off current vs. ambient temperature characteristics

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



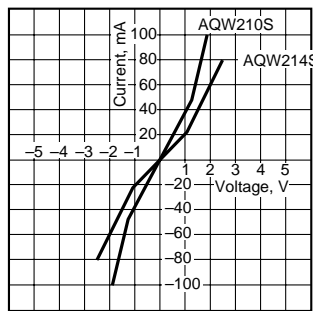
## 7. LED dropout voltage vs. ambient temperature characteristics

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



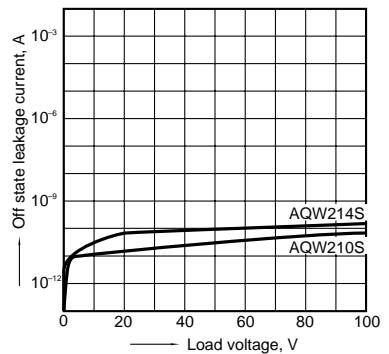
## 8. Voltage vs. current characteristics of output at MOS portion

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



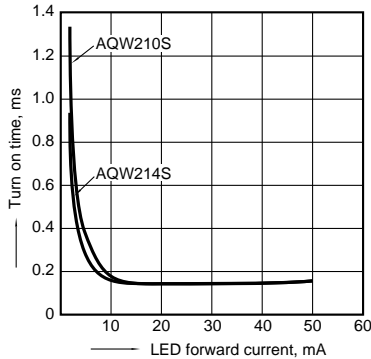
## 9. Off state leakage current

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



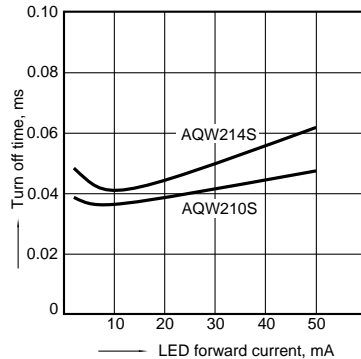
## 10. LED forward current vs. turn on time characteristics

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;  
Ambient temperature: 25°C 77°F

