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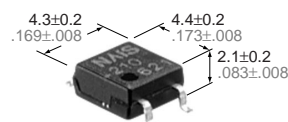
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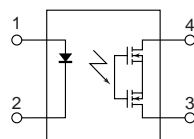
# NAIS

## GU (General Use) Type SOP Series 1- Channel (Form A) 4-Pin Type

# PhotoMOS RELAYS



mm inch

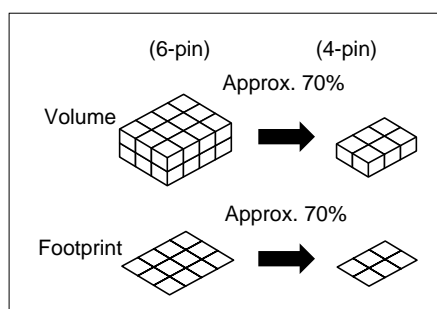


## FEATURES

### 1. SO package 4-Pin type in super mini- ature design

The device comes in a super-miniature SO package 4-Pin type measuring

(W)4.3 × (L)4.4 × (H)2.1 mm (W).169 × (L).173 × (H).083 inch —approx. 70% of the volume and 70% of the footprint size of SO package 6-pin type PhotoMOS Relays.



### 2. Tape and reel

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

### 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 (AQY214S) even with the rated load voltage of 400 V.

## TYPICAL APPLICATIONS

- Telecommunications (PC, Electronic Notepad)
- Measuring and Testing equipment
- Factory Automation Equipment
- Security equipment
- High speed inspection machines

## TYPES

### AC/DC type

Output rating*		Part No.		Packing quantity in tape and reel
Load voltage	Load current	Picked from the 1/2-pin side	Picked from the 3/4-pin side	
350 V	120 mA	AQY210SX	AQY210SZ	1,000 pcs.
400 V	100 mA	AQY214SX	AQY214SZ	

\* 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: 100 pcs.; Case: 2,000 pcs.)

(2) For space reasons, the top two letters of the product number "AQY" and "S" are omitted on the product seal. The package type indicator "X" and "Z" are omitted from the seal. (Ex. the label for product number AQY210S is 210).

## RATING

### AC/DC type

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

Item		Symbol	AQY210S	AQY214S	Remarks
Input	LED forward current	I <sub>F</sub>	50 mA		f = 100 Hz, Duty factor = 0.1%
	LED reverse voltage	V <sub>R</sub>	3 V		
	Peak forward current	I <sub>FP</sub>	1 A		
	Power dissipation	P <sub>in</sub>	75 mW		
Output	Load voltage (peak AC)	V <sub>L</sub>	350 V	400 V	100ms (1 shot), V <sub>L</sub> = DC
	Continuous load current (peak AC)	I <sub>L</sub>	0.12 A	0.1 A	
	Peak load current	I <sub>peak</sub>	0.3 A	0.24 A	
	Power dissipation	P <sub>out</sub>	300 mW		
Total power dissipation		P <sub>T</sub>	350 mW		
I/O isolation voltage		V <sub>iso</sub>	1,500 V AC		
Temperture 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		

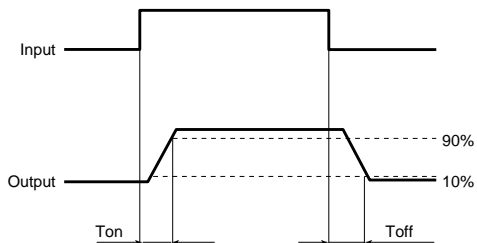
## 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	AQY210S	AQY214S	Remarks
Input	LED operate current	Typical	I <sub>Fon</sub>	0.9 mA		I <sub>L</sub> = Max.
		Maximum		3 mA		
	LED turn off current	Minimum	I <sub>Foff</sub>	0.4 mA		I <sub>L</sub> = Max.
		Typical		0.85 mA		
	LED dropout voltage	Typical	V <sub>F</sub>	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	R <sub>on</sub>	17 Ω	25 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s on time
		Maximum		25 Ω	35 Ω	
	Off state leakage current	Maximum	I <sub>LLeak</sub>	1 μA		I <sub>F</sub> = 0 I <sub>L</sub> = Max.
Transfer characteristics	Turn on time*	Typical	T <sub>on</sub>	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	T <sub>off</sub>	0.04 ms		I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum		0.2 ms		
	I/O capacitance	Maximum	C <sub>iso</sub>	1.5 pF		f = 1 MHz V <sub>B</sub> = 0
	Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000 MΩ		500 V DC

Note: Recommendable LED forward current  $I_F = 5 \text{ mA}$ .

For type of connection, see page 31.

\*Turn on/Turn off time



■ For Dimensions, see Page 28.

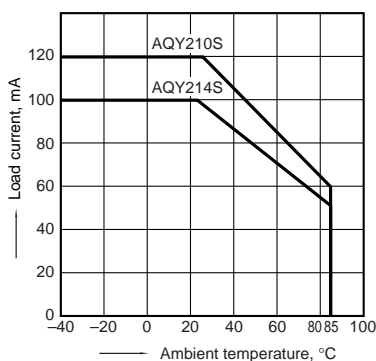
■ For Schematic and Wiring Diagrams, see Page 31.

■ For Cautions for Use, see Page 36.

## REFERENCE DATA

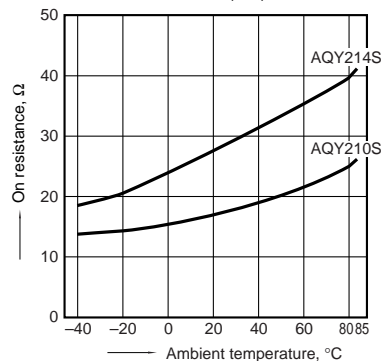
### 1. Load current vs. ambient temperature characteristics

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



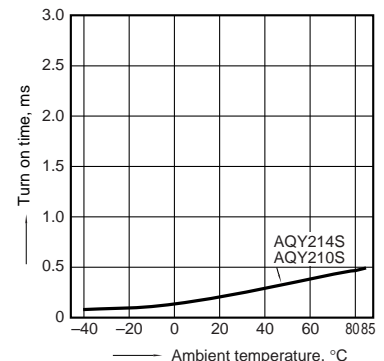
### 2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4;  
LED current: 5 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



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

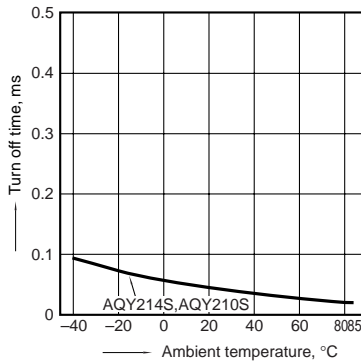
LED current: 5 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



# AQY210S

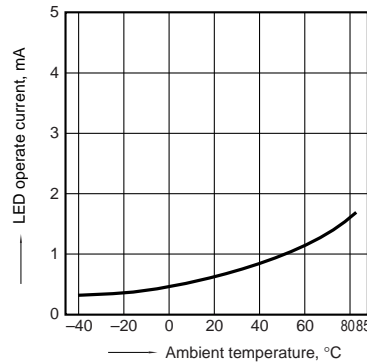
## 4. Turn off time vs. ambient temperature characteristics

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



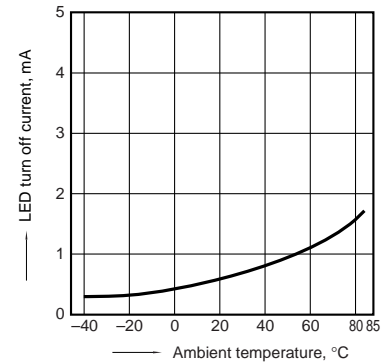
## 5. LED operate current vs. ambient temperature characteristics

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



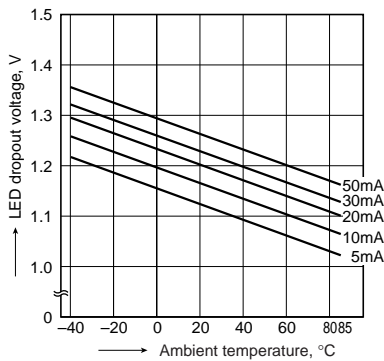
## 6. LED turn off current vs. ambient temperature characteristics

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



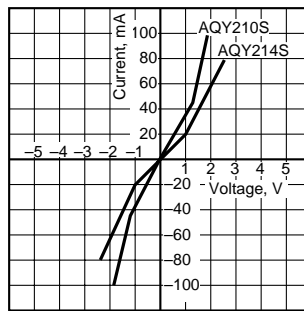
## 7. LED dropout voltage vs. ambient temperature characteristics

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



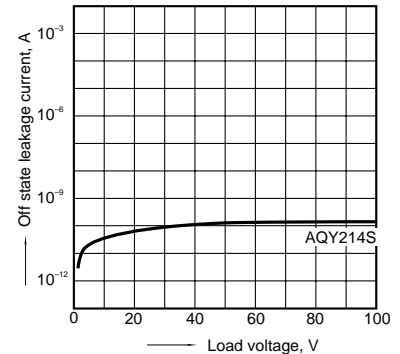
## 8. Voltage vs. current characteristics of output at MOS portion

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



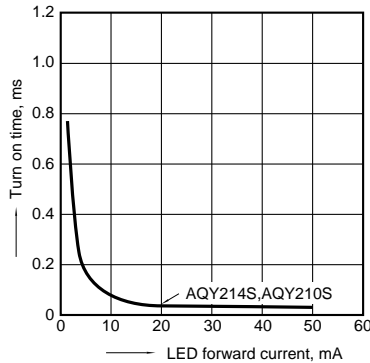
## 9. Off state leakage current

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



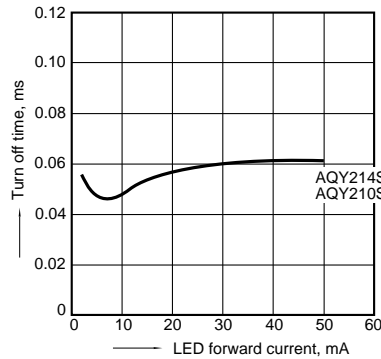
## 10. LED forward current vs. turn on time characteristics

Measured portion: between terminals 3 and 4;  
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 3 and 4;  
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 3 and 4;  
Frequency: 1 MHz; Ambient temperature: 25°C 77°F

