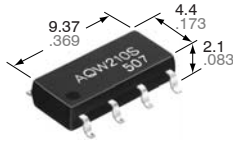
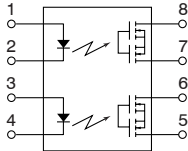


Super miniature design,  
SOP (2 Form A) 8-pin type.  
Controls load voltage  
350V, 400V.

## GU PhotoMOS (AQW210S)



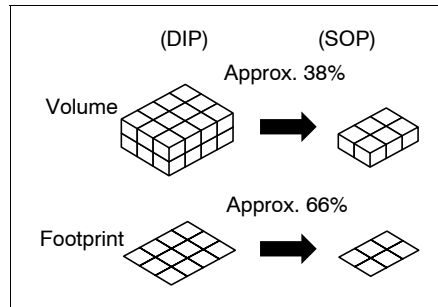
mm inch



### FEATURES

#### 1. 2 channels in super miniature design

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



#### 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 milliamperes, the PhotoMOS relay features a very small off state leakage current of typ. 100 pA even with the rated load voltage of 400 V (AQW214S)

### TYPICAL APPLICATIONS

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

### TYPES

Type	Output rating*		Package size	Part No.			Packing quantity	
	Load voltage	Load current		Tube packing style	Tape and reel packing style		Tube	Tape and reel
AC/DC type	350V	100mA	SOP8pin	AQW210S	AQW210SX (Picked from the 1/2/3/4-pin side)	AQW210SZ (Picked from the 5/6/7/8-pin side)	1 tube contains: 50 pcs. 1 batch contains: 1,000 pcs.	1,000 pcs.
	400V	80mA		AQW214S	AQW214SX (Picked from the 1/2/3/4-pin side)	AQW214SZ (Picked from the 5/6/7/8-pin side)		

\* Indicate the peak AC and DC values.

Note: For space reasons, the package style indicator "X" or "Z" are not marked on the relay.

### 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		
	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>	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		
Total power dissipation	P <sub>T</sub>	650 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		

# GU PhotoMOS (AQW210S)

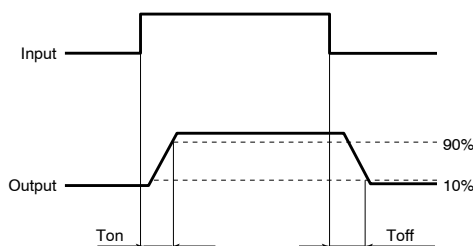
## 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item		Symbol	AQW210S	AQW214S	Remarks
Input	LED operate current	Typical	0.9 mA		$I_L = \text{Max.}$
		Maximum	3 mA		
	LED turn off current	Minimum	0.4 mA		$I_L = \text{Max.}$
		Typical	0.8 mA		
LED dropout voltage	Typical	1.25 V (1.14 V at $I_F = 5 \text{ mA}$ )		$I_F = 50 \text{ mA}$	
	Maximum	1.5 V			
Output	On resistance	Typical	16 $\Omega$	30 $\Omega$	$I_F = 5 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time
		Maximum	35 $\Omega$	50 $\Omega$	
	Off state leakage current	Maximum	1 $\mu\text{A}$		$I_F = 0 \text{ mA}$ $V_L = \text{Max.}$
Transfer characteristics	Turn on time*	Typical	0.23 ms	0.21 ms	$I_F = 5 \text{ mA}$ $I_L = \text{Max.}$
		Maximum	0.5 ms		
	Turn off time*	Typical	0.04 ms		$I_F = 5 \text{ mA}$ $I_L = \text{Max.}$
		Maximum	0.2 ms		
	I/O capacitance	Typical	0.8 pF		$f = 1 \text{ MHz}$ $V_B = 0 \text{ V}$
Maximum		1.5 pF			
Initial I/O isolation resistance	Minimum	$R_{iso}$	1,000 M $\Omega$		500 V DC

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

[Type of connection](#)

\*Turn on/ Turn off time

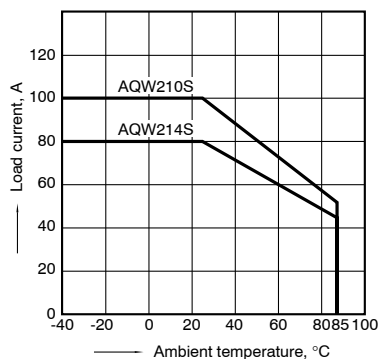


- [Dimensions](#)
- [Schematic and Wiring Diagrams](#)
- [Cautions for Use](#)

## REFERENCE DATA

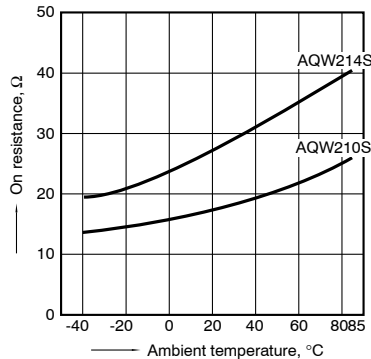
### 1. Load current vs. ambient temperature characteristics

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



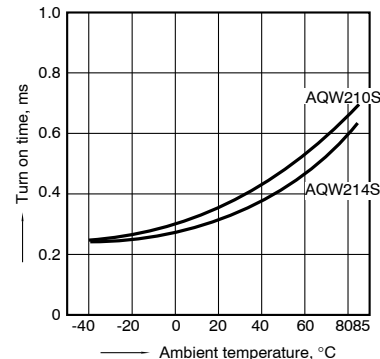
### 2. On resistance vs. ambient temperature characteristics

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



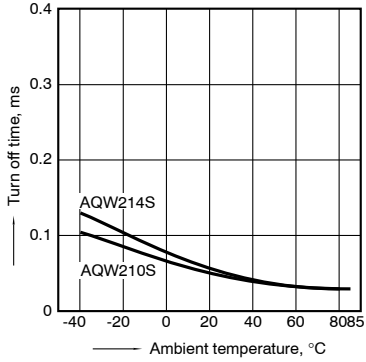
### 3. Turn on time vs. ambient temperature characteristics

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



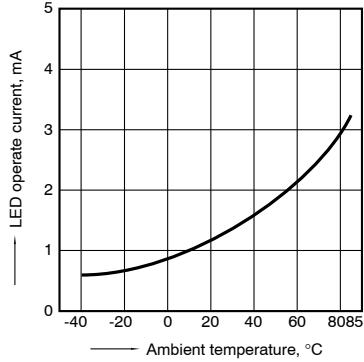
### 4. Turn off time vs. ambient temperature characteristics

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



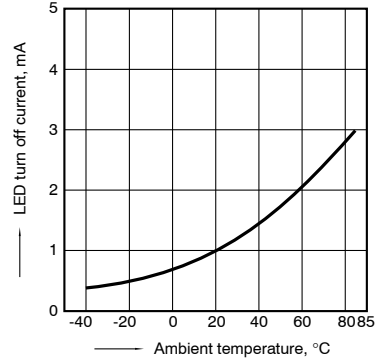
### 5. LED operate current vs. ambient temperature characteristics

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



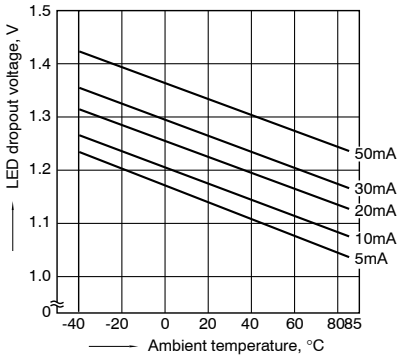
### 6. LED turn off current vs. ambient temperature characteristics

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



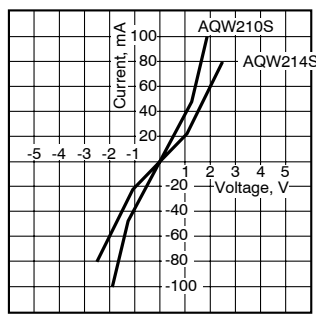
### 7. LED dropout voltage vs. ambient temperature characteristics

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



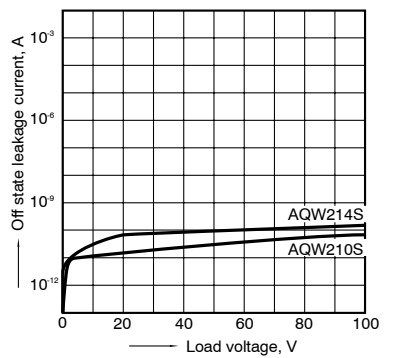
### 8. Current vs. voltage characteristics of output at MOS portion

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



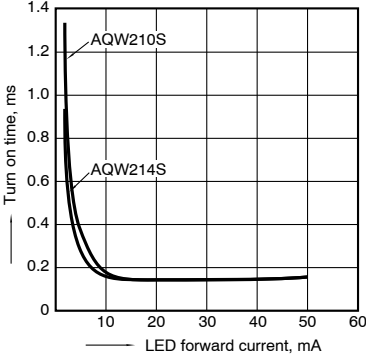
### 9. Off state leakage current vs. load voltage characteristics

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



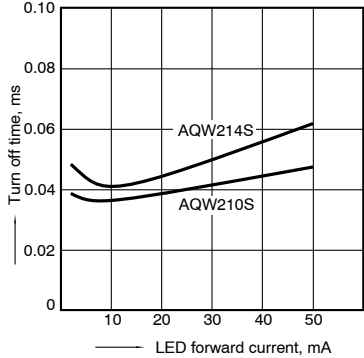
### 10. Turn on time vs. LED forward current characteristics

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. Turn off time vs. LED forward current 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. Output capacitance vs. applied voltage characteristics

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

