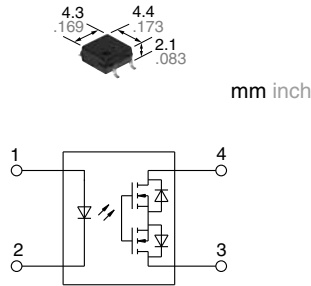




**Miniature SOP4-pin type of  
60V/350V/400V load voltage**

**PhotoMOS<sup>®</sup>  
GU SOP 1 Form A  
(AQY210S)**



**RoHS compliant**

### FEATURES

- Controls low-level analog signals**  
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.
- Small SOP4-Pin package**  
The device comes in a miniature SOP4-pin type measuring (W)4.3 × (L)4.4 × (H)2.1 mm (W).169 × (L).173 × (H).083 inch
- Low-level off state leakage current of max. 1 μA**
- Load voltage 60V, 350V and 400V types available**

### TYPICAL APPLICATIONS

- Telecommunication (PC, electronic notepad)
- Measuring and testing equipment
- Factory automation equipment
- Security equipment
- Computers
- Industrial robots

### TYPES

	Output rating*		Package	Part No.			Packing quantity	
	Load voltage	Load current		Tube packing style	Tape and reel packing style		Tube	Tape and reel
					Picked from the 1/2-pin side	Picked from the 3/4-pin side		
AC/DC dual use	60V	500mA	SOP4-pin	AQY212S	AQY212SX	AQY212SZ	1 tube contains: 100 pcs. 1 batch contains: 2,000 pcs.	1,000 pcs.
	350V	120mA		AQY210S	AQY210SX	AQY210SZ		
	400V	100mA		AQY214S	AQY214SX	AQY214SZ		

\* Indicate the peak AC and DC values.  
Note: For space reasons, the three initial letters of the part number "AQY", the surface mount terminal indicator "S" and the packing style indicator "X" or "Z" are not marked on the device. (Ex. the label for product number AQY210SX is 210.)

### RATING

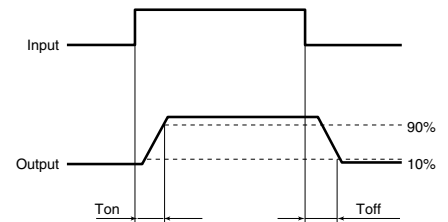
#### 1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item		Symbol	AQY212S	AQY210S	AQY214S	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>	60 V	350 V	400 V	
	Continuous load current	I <sub>L</sub>	0.5 A	0.12 A	0.1 A	Peak AC, DC
	Peak load current	I <sub>peak</sub>	1.5 A	0.3 A	0.24 A	100ms (1 shot), V <sub>L</sub> = DC
	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 Vrms			
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	AQY212S	AQY210S	AQY214S	Condition
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	0.85 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	0.83 Ω	17 Ω	25 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s
		Maximum	2.5 Ω	25 Ω	35 Ω	
	Off state leakage current	Maximum	1 μA			I <sub>F</sub> = 0 mA V <sub>L</sub> = Max.
Transfer characteristics	Turn on time*	Typical	0.65 ms	0.23 ms	0.21 ms	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum	2 ms	0.5 ms	0.5 ms	
	Turn off time*	Typical	0.08 ms	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 V
Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000 MΩ			500 V DC

\*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
AQY212S	Load voltage (Peak AC)	V <sub>L</sub>	48	V
	Continuous load current	I <sub>L</sub>	0.5	A
AQY210S	Load voltage (Peak AC)	V <sub>L</sub>	280	V
	Continuous load current	I <sub>L</sub>	0.12	A
AQY214S	Load voltage (Peak AC)	V <sub>L</sub>	320	V
	Continuous load current	I <sub>L</sub>	0.1	A

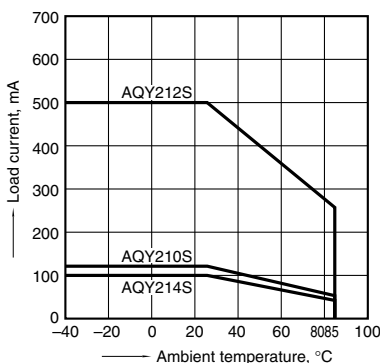
■ These products are not designed for automotive use.

If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

## REFERENCE DATA

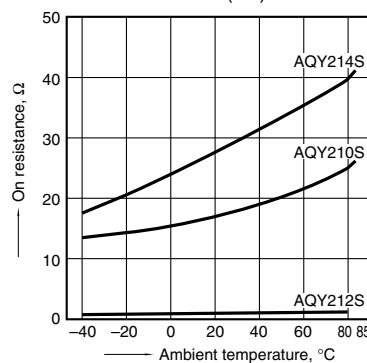
1. Load current vs. ambient temperature characteristics

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



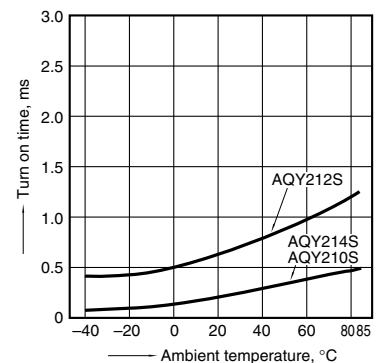
2. On resistance vs. ambient temperature characteristics

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



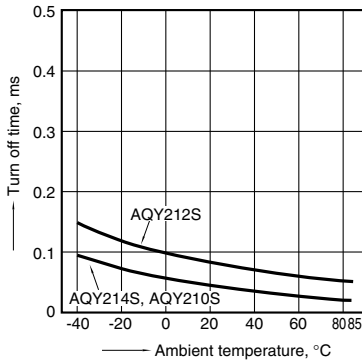
3. Turn on time vs. ambient temperature characteristics

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



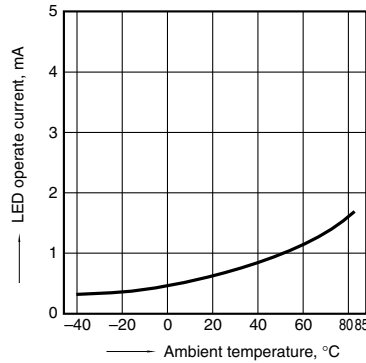
4. Turn off time vs. ambient temperature characteristics

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



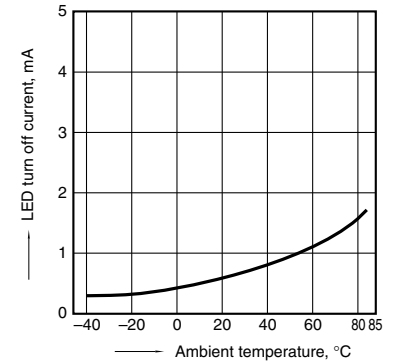
5. LED operate current vs. ambient temperature characteristics

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



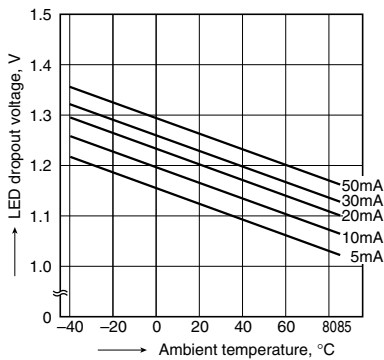
6. LED turn off current vs. ambient temperature characteristics

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



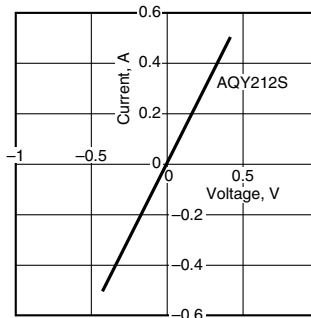
7. LED dropout voltage vs. ambient temperature characteristics

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



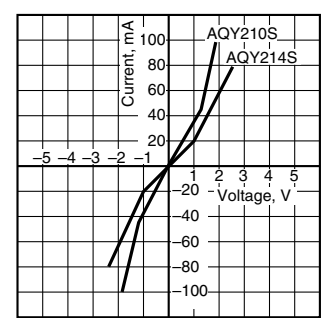
8-(1). Current vs. voltage characteristics of output at MOS portion

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



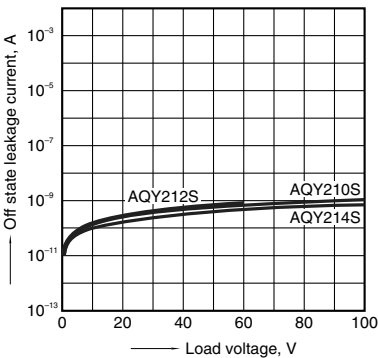
8-(2). Current vs. voltage characteristics of output at MOS portion

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



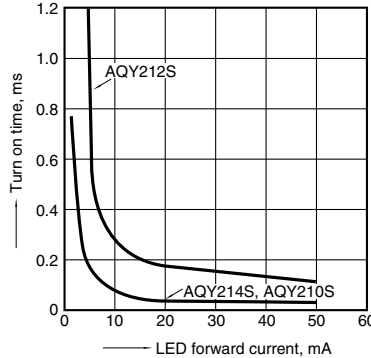
9. Off state leakage current vs. load voltage characteristics

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



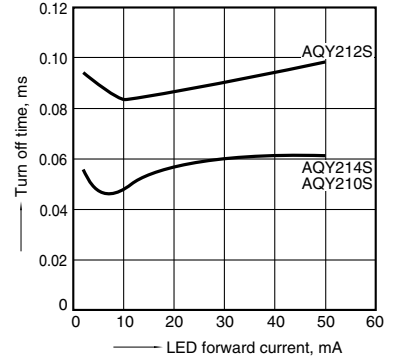
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4; Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



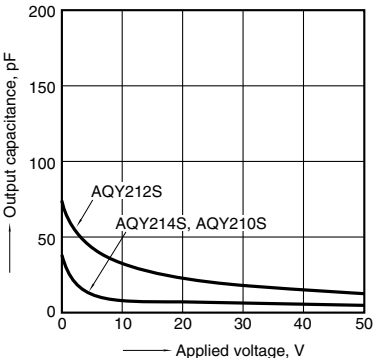
11. Turn off time vs. LED forward current characteristics

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



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\*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/)

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