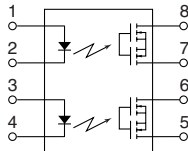


mm inch



RoHS compliant

## FEATURES

### 1. 2 channels in miniature SOP8-pin 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 DIP8-pin type.

### 2. Controls low-level analog signals

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

### 3. Low-level off state leakage current of max. 1 μA

## TYPICAL APPLICATIONS

- Measuring instruments
- Data communications
- Computers
- Industrial robots
- High-speed inspection machines.

## 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 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side		
AC/DC dual use	60V	400mA	SOP8-pin	AQW212S	AQW212SX	AQW212SZ	1 tube contains: 50 pcs. 1 batch contains: 1,000 pcs.	1,000 pcs.
	350V	100mA		AQW210S	AQW210SX	AQW210SZ		
	400V	80mA		AQW214S	AQW214SX	AQW214SZ		

\* Indicate the peak AC and DC values.

Note: The packing style indicator "X" or "Z" are not marked on the device.

## RATING

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

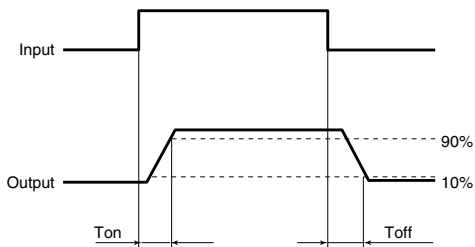
Item		Symbol	AQW212S	AQW210S	AQW214S	Remarks
Input	LED forward current	I <sub>F</sub>	50 mA			
	LED reverse voltage	V <sub>R</sub>	5 V			
	Peak forward current	I <sub>FP</sub>	1 A			f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75 mW			
Output	Load voltage (peak AC)	V <sub>L</sub>	60 V	350 V	400 V	
	Continuous load current	I <sub>L</sub>	0.4 A (0.5 A)	0.1 A (0.13 A)	0.08 A (0.1 A)	Peak AC, DC ( ): in case of using only 1 channel
	Peak load current	I <sub>peak</sub>	1.5 A	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 SOP 2 Form A (AQW210S)

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

Item			Symbol	AQW212S	AQW210S	AQW214S	Remarks
Input	LED operate current	Typical	$I_{Fon}$	0.9 mA			$I_L = \text{Max.}$
		Maximum		3 mA			
	LED turn off current	Minimum	$I_{Foff}$	0.4 mA			$I_L = \text{Max.}$
		Typical		0.8 mA			
LED dropout voltage	Typical	$V_F$	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	$R_{on}$	0.83 $\Omega$	16 $\Omega$	30 $\Omega$	$I_F = 5 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time
		Maximum		2.5 $\Omega$	35 $\Omega$	50 $\Omega$	
	Off state leakage current	Maximum	$I_{Leak}$	1 $\mu\text{A}$			$I_F = 0 \text{ mA}$ $V_L = \text{Max.}$
Transfer characteristics	Turn on time*	Typical	$T_{on}$	0.65 ms	0.23 ms	0.21 ms	$I_F = 5 \text{ mA}$ $I_L = \text{Max.}$
		Maximum		2 ms			
	Turn off time*	Typical	$T_{off}$	0.08 ms	0.04 ms		$I_F = 5 \text{ mA}$ $I_L = \text{Max.}$
		Maximum		0.2 ms			
	I/O capacitance	Typical	$C_{iso}$	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	

\*Turn on/ Turn off time



## RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper device operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	$I_F$	5	mA

- For Dimensions.
- For Schematic and Wiring Diagrams.
- For 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 Corporation technical representative.

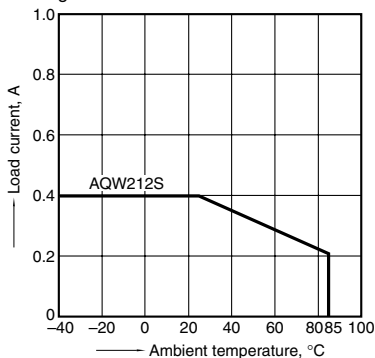
For more information.

## REFERENCE DATA

1.- (1) Load current vs. ambient temperature characteristics

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

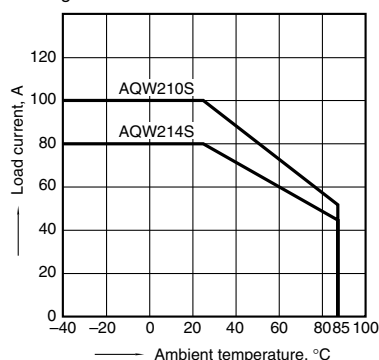
When using 2 channels



1.- (2) Load current vs. ambient temperature characteristics

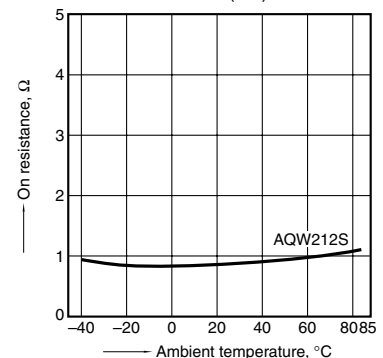
Allowable ambient temperature:  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
 $-40^\circ\text{F}$  to  $+185^\circ\text{F}$

When using 2 channels



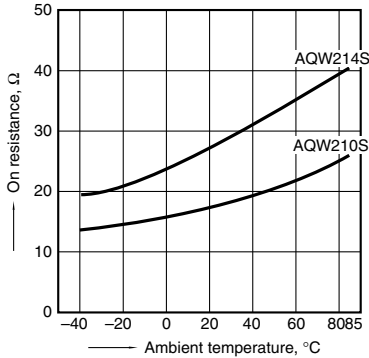
2.- (1) On resistance vs. ambient temperature characteristics

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



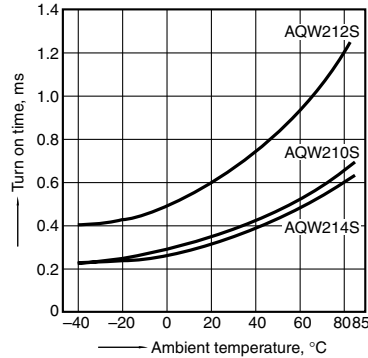
## 2.-(2) On resistance vs. ambient temperature characteristics

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



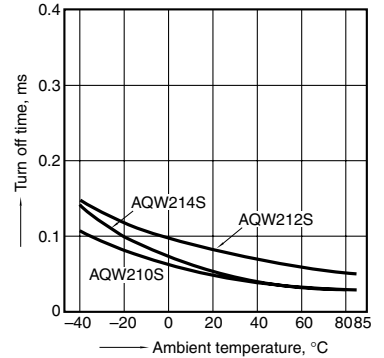
## 3. Turn on time vs. ambient temperature characteristics

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



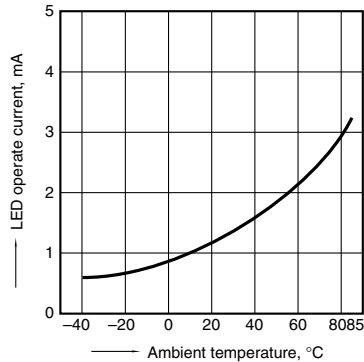
## 4. Turn off time vs. ambient temperature characteristics

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



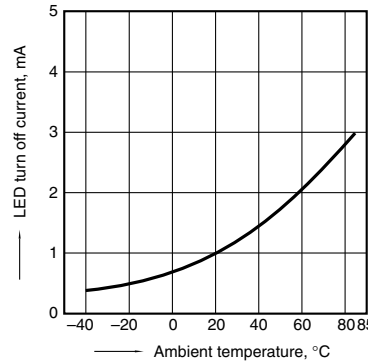
## 5. LED operate current vs. ambient temperature characteristics

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



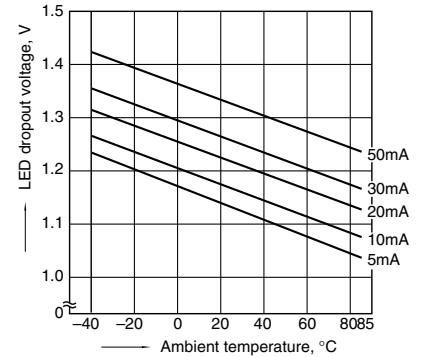
## 6. LED turn off current vs. ambient temperature characteristics

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



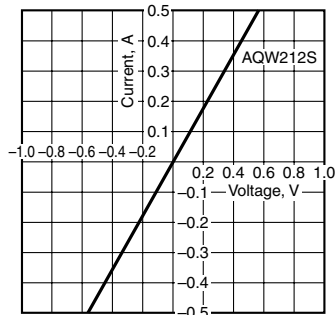
## 7. LED dropout voltage vs. ambient temperature characteristics

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



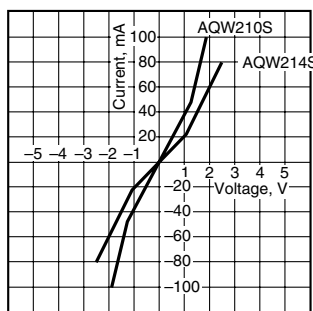
## 8.-(1) Current vs. voltage characteristics of output at MOS portion

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



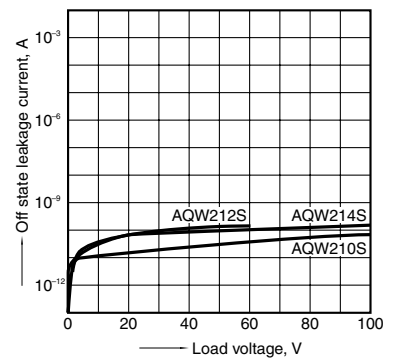
## 8.-(2) Current vs. voltage characteristics of output at MOS portion

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



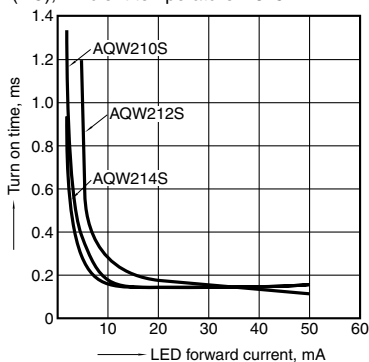
## 9. Off state leakage current vs. load voltage characteristics

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



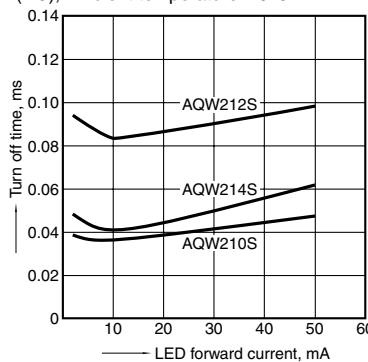
## 10. Turn on time vs. LED forward current characteristics

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



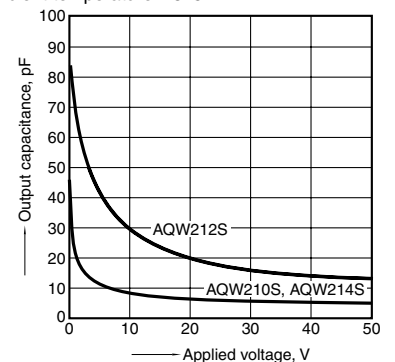
## 11. Turn off time vs. LED forward current characteristics

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



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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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