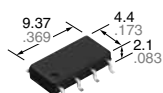


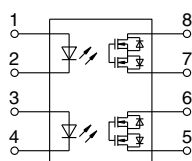


**Normally closed  
SOP8-pin type  
of 400V load voltage**

**PhotoMOS®  
GU SOP 2 Form B  
(AQW414S)**



mm inch



**RoHS compliant**

### FEATURES

**1. 2 channels in miniature SOP8-pin design**

The device comes in a super-miniature SO package measuring —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. I/O isolation voltage of 1,500Vrms**

### TYPICAL APPLICATIONS

- Power supply
- Measuring instruments
- Security equipment
- Industrial robots
- Sensing equipment

### TYPES

	Output rating*		Package	Part No.			Packing quantity	
	Load voltage	Load current		Through hole terminal	Surface-mount terminal		Tube	Tape and reel
				Tube packing style	Tape and reel packing style			
				Picked from the 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side			
AC/DC dual use	400 V	80 mA	SOP8-pin	AQW414S	AQW414SX	AQW414SZ	1 tube contains: 50 pcs. 1 batch contains: 1,000 pcs.	1,000 pcs

\*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)**

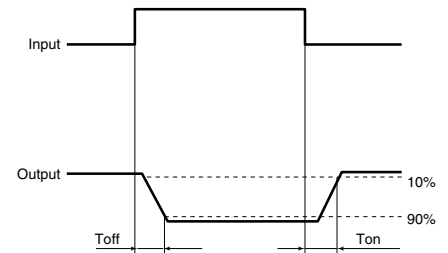
	Item	Symbol	AQW414S	Remarks
Input	LED forward current	I <sub>F</sub>	50 mA	
	LED reverse voltage	V <sub>R</sub>	5 V	
	Peak forward current	I <sub>FP</sub>	1 A	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75 mW	
Output	Load voltage (peak AC)	V <sub>L</sub>	400 V	
	Continuous load current	I <sub>L</sub>	0.08 A (0.1 A)	Peak AC, DC ( ): in case of using only 1 channel
	Peak load current	I <sub>peak</sub>	0.24 A	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 Vrms	
Ambient temperature	Operating	T <sub>opr</sub>	-40 to +85°C -40 to +185°F	(Non-icing at low temperatures)
	Storage	T <sub>stag</sub>	-40 to +100°C -40 to +212°F	

# GU SOP 2 Form B (AQW414S)

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

Item		Symbol	AQW414S	Condition
Input	LED operate (OFF) current	Typical	0.9 mA	$I_L = \text{Max.}$
		Maximum	3 mA	
	LED reverse (ON) 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	26 $\Omega$	$I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s
		Maximum	50 $\Omega$	
	Off state leakage current	Maximum	1 $\mu\text{A}$	$I_F = 5 \text{ mA}$ $V_L = \text{Max.}$
Transfer characteristics	Operate (OFF) time*	Typical	0.43 ms	$I_F = 0 \text{ mA} \rightarrow 5 \text{ mA}$ $I_L = \text{Max.}$
		Maximum	1 ms	
	Reverse (ON) time*	Typical	0.3 ms	$I_F = 5 \text{ mA} \rightarrow 0 \text{ mA}$ $I_L = \text{Max.}$
		Maximum	1 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

\*Operate/Reverse time



## 3. Recommended operating conditions (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

Item	Symbol	Number of used channels	Min.	Max.	Unit
LED current	$I_F$	1ch 2ch	5	30	mA
Load voltage (Peak AC)	$V_L$		—	320	V
Continuous load current	$I_L$		—	0.1	0.08

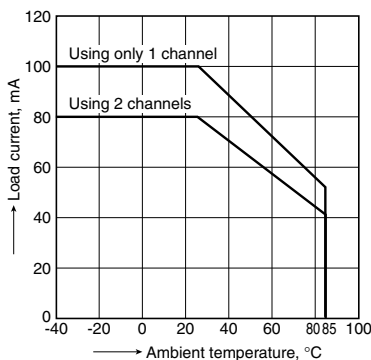
■ These products are not designed for automotive use.

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

## REFERENCE DATA

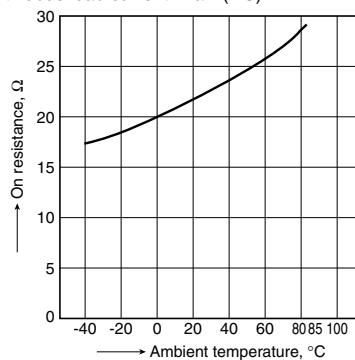
1. Load current vs. ambient temperature characteristics

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



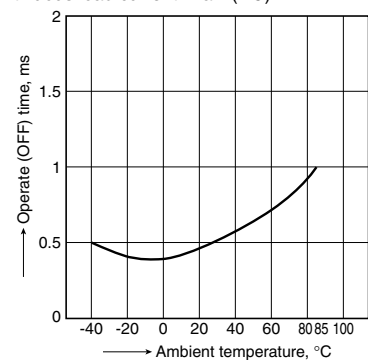
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8;  
LED current: 0 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



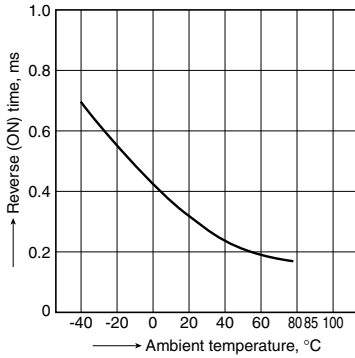
3. Operate (OFF) time vs. ambient temperature characteristics

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



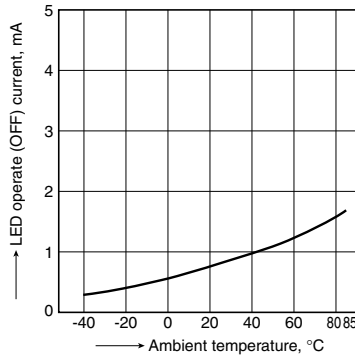
4. Reverse (ON) time vs. ambient temperature characteristics

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



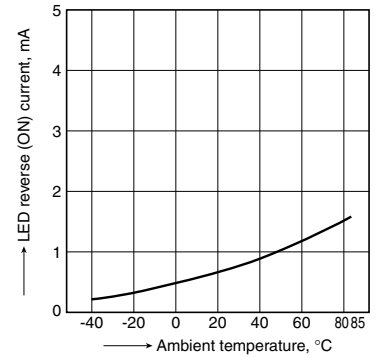
5. LED operate (OFF) current vs. ambient temperature characteristics

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



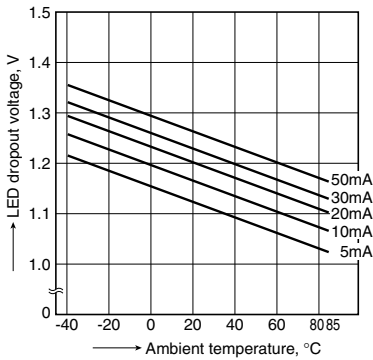
6. LED reverse (ON) current vs. ambient temperature characteristics

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



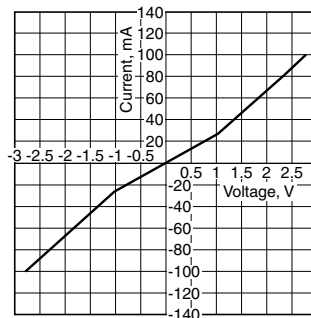
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



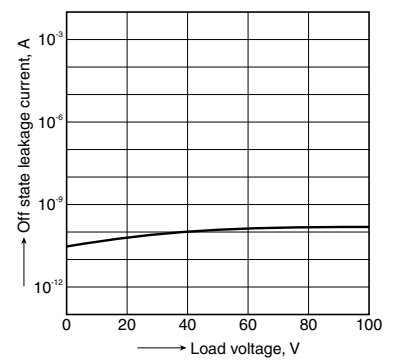
8. Current vs. voltage characteristics of output at MOS portion

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



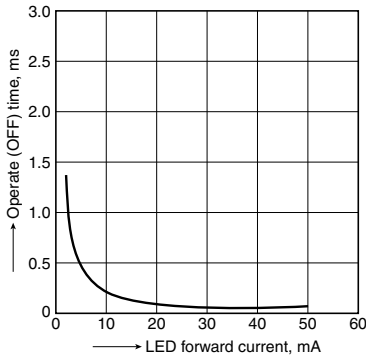
9. Off state leakage current vs. load voltage characteristics

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



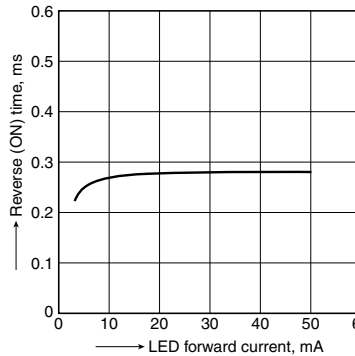
10. Operate (OFF) time vs. LED forward current characteristics

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



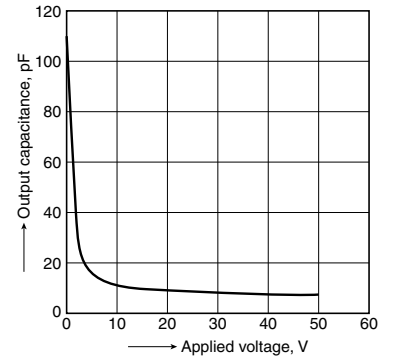
11. Reverse (ON) time vs. LED forward current characteristics

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



12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8; LED current: 5 mA; 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.

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