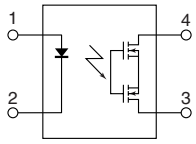
Panasonic
ideas for life

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

PhotoMOS®
GU SOP 1 Form A
(AQY21○S)

mm inch



RoHS compliant

FEATURES

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

2. 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

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

4. Load voltage 60V, 350V and 400V types available

TYPICAL APPLICATIONS

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

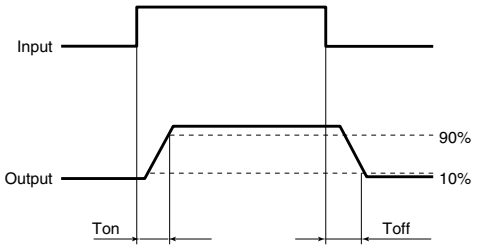
Item		Symbol	AQY212S	AQY210S	AQY214S	Remarks
Input	LED forward current	I_F	50 mA			
	LED reverse voltage	V_R	5 V			
	Peak forward current	I_{FP}	1 A			f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW			
Output	Load voltage (peak AC)	V_L	60 V	350 V	400 V	
	Continuous load current	I_L	0.5 A	0.12 A	0.1 A	Peak AC, DC
	Peak load current	I_{peak}	1.5 A	0.3 A	0.24 A	100ms (1 shot), V_L = DC
	Power dissipation	P_{out}	300 mW			
Total power dissipation		P_T	350 mW			
I/O isolation voltage		V_{iso}	1,500 V AC			
Temperature limits	Operating	T_{opr}	–40°C to +85°C –40°F to +185°F			Non-condensing at low temperatures
	Storage	T_{stg}	–40°C to +100°C –40°F to +212°F			

GU SOP 1 Form A (AQY21❍S)

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

Item			Symbol	AQY212S	AQY210S	AQY214S	Remarks
Input	LED operate current	Typical	I_{Fon}	0.9 mA			I_L = Max.
		Maximum		3 mA			
	LED turn off current	Minimum	I_{Foff}	0.4 mA			I_L = Max.
		Typical		0.85 mA			
	LED dropout voltage	Typical	V_F	1.25 V (1.14 V at I_F = 5 mA)			I_F = 50 mA
		Maximum		1.5 V			
Output	On resistance	Typical	R_{on}	0.83 Ω	17 Ω	25 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
		Maximum		2.5 Ω	25 Ω	35 Ω	
	Off state leakage current	Maximum	I_{Leak}	1 μA			I_F = 0 mA V_L = Max.
Transfer characteristics	Turn on time*	Typical	T_{on}	0.65 ms	0.23 ms	0.21 ms	I_F = 5 mA I_L = Max.
		Maximum		2 ms	0.5 ms	0.5 ms	
	Turn off time*	Typical	T_{off}	0.08 ms	0.04 ms		I_F = 5 mA I_L = Max.
		Maximum		0.2 ms			
	I/O capacitance	Maximum	C_{iso}	1.5 pF			f = 1 MHz V_B = 0 V
	Initial I/O isolation resistance	Minimum	R_{iso}	1,000 MΩ			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

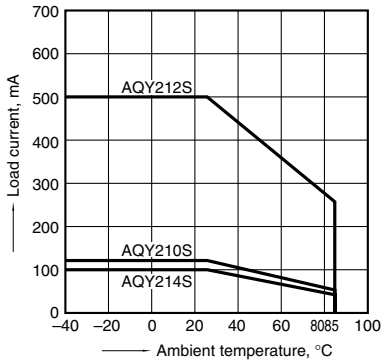
■ For Dimensions.
■ For Schematic and Wiring Diagrams.
■ For Cautions for Use.

■ 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

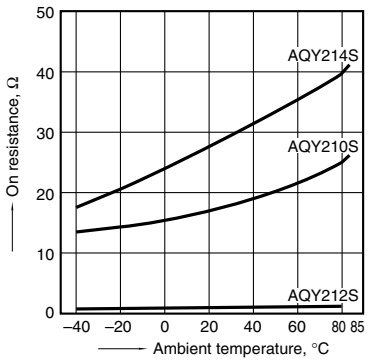
1. Load current vs. ambient temperature characteristics

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



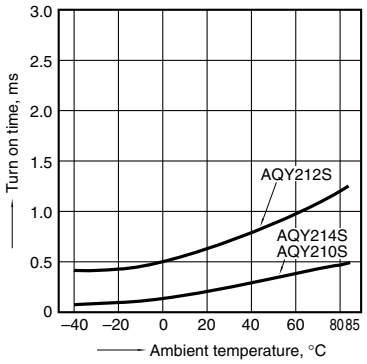
2. On resistance vs. ambient temperature characteristics

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



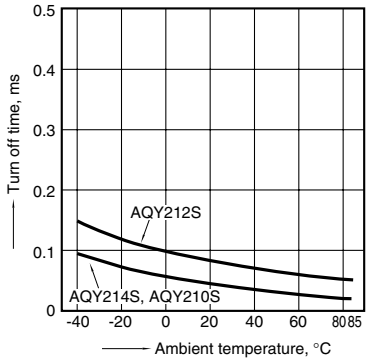
3. Turn on time vs. ambient temperature characteristics

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



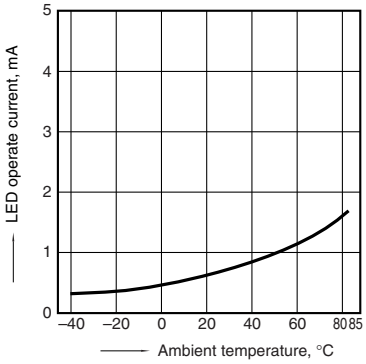
4. Turn off time vs. ambient temperature characteristics

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



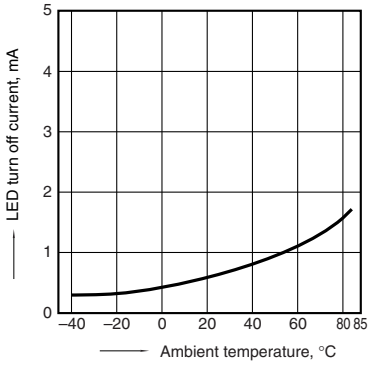
5. LED operate current vs. ambient temperature characteristics

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



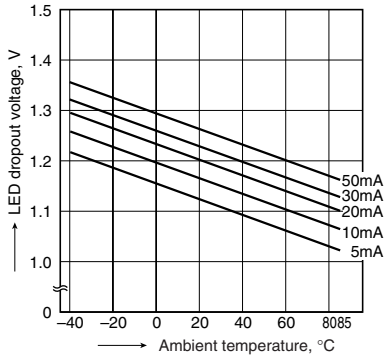
6. LED turn off current vs. ambient temperature characteristics

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



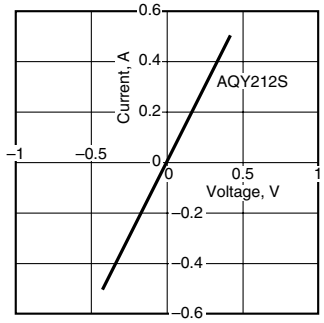
7. LED dropout voltage vs. ambient temperature characteristics

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



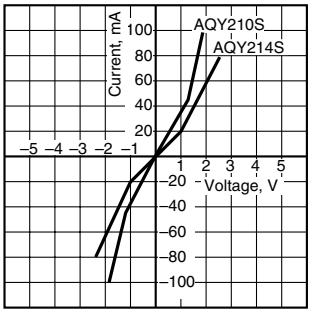
8-(1). Current vs. voltage characteristics of output at MOS portion

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



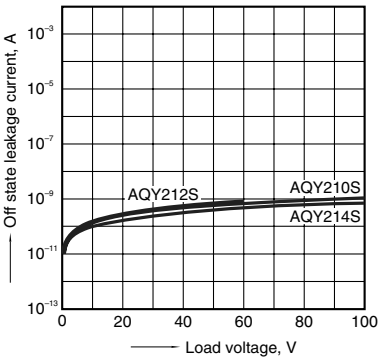
8-(2). Current vs. voltage characteristics of output at MOS portion

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



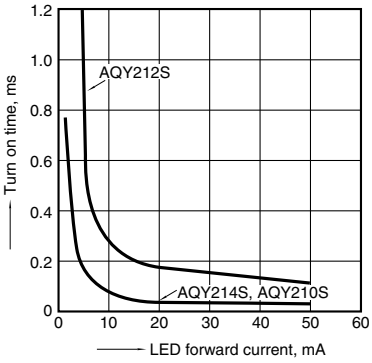
9. Off state leakage current vs. load voltage characteristics

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



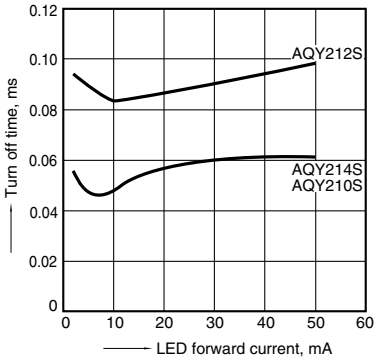
10. Turn on time vs. LED forward current characteristics

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