

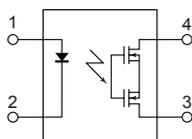
Panasonic
ideas for life

**Super miniature design,
SOP (1 Form B) 4-pin type.
Controls load voltage
60V, 350V, 400V.**

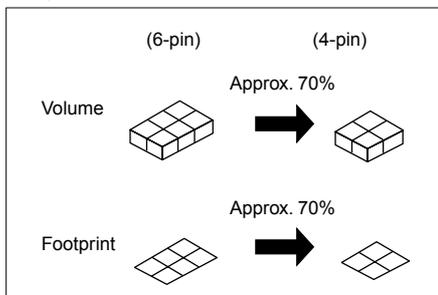
**GU PhotoMOS
(AQY410S)**



mm inch

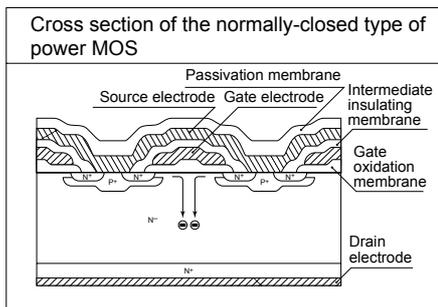


SO package 6-pin type PhotoMOS relays.



2. Normally closed type (1 Form B) is low on-resistance.
(All AQ○4 PhotoMOS are Form B types. And also the Form A types have a low on-resistance.)

This has been realized thanks to the built-in MOSFET processed by our proprietary method, DSD (Double-diffused and Selective Doping) method.



3. Tape and reel

The device comes standard in a tape and reel (1,000 pcs./reel) to facilitate automatic insertion machines.

4. Controls low-level analog signals

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

5. 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 1nA even with the rated load voltage of 400 V (AQY414S).

FEATURES

1. 60V type couples high capacity (0.5A) with low on-resistance (1Ω).

Item	GU SOP type	
	AQY410S	AQY412S NEW
Load voltage	350V	60V
Continuous load current	0.12A	0.5A
ON resistance (typ.)	18Ω	1Ω

2. SO package 4-pin type in super miniature design

The device comes in a super-miniature SO package 4-pin type measuring (W) 4.3×(L) 4.4×(H) 2.1 mm (W) .169×(L) .173×(H) .083 inch —approx. 70% of the volume and 70% of the footprint size of

TYPICAL APPLICATIONS

- Power supply
- Measuring equipment
- Security equipment
- Telephone equipment
- Sensors

TYPES

AC/DC type

Output rating*		Part No.		Packing quantity in tape and reel
Load voltage	Load current	Picked from the 1/2-pin side	Picked from the 3/4-pin side	
60 V	500 mA	AQY412SX	AQY412SZ	1,000 pcs.
350 V	120 mA	AQY410SX	AQY410SZ	
400 V	100 mA	AQY414SX	AQY414SZ	

* Indicate the peak AC and DC values.

Notes: (1) Tape package is the standard packing style. Also available in tube. (Part No. suf x "X" or "Z" is not needed when ordering; Tube: 100 pcs.; Case: 2,000 pcs.)

(2) For space reasons, the top two letters of the product number "AQY" and "S" are omitted on the product seal. The package type indicator "X" and "Z" are omitted from the seal. (Ex. the label for product number AQY414S is 414).

GU PhotoMOS (AQY41○S)

RATING

AC/DC type

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

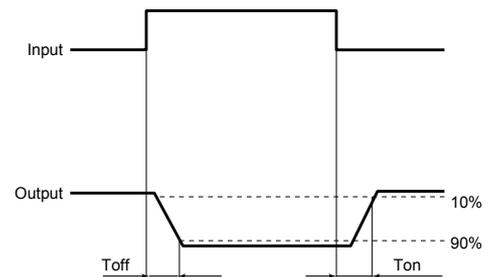
Item		Symbol	AQY412S	AQY410S	AQY414S	Remarks
Input	LED forward current	I_F	50 mA			
	LED reverse voltage	V_R	5 V			
	Peak forward current	I_{FP}	1 A			f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW			
Output	Load voltage (peak AC)	V_L	60 V	350 V	400 V	
	Continuous load current (peak AC)	I_L	0.5 A	0.12 A	0.1 A	
	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			

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

Item			Symbol	AQY412S	AQY410S	AQY414S	Remarks
Input	LED operate (OFF) current	Typical	I_{Foff}	0.9 mA			$I_L = \text{Max.}$
		Maximum		3 mA			
	LED reverse (ON) current	Minimum	I_{Fon}	0.4 mA			$I_L = \text{Max.}$
		Typical		0.85 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}	1 Ω	18 Ω	26 Ω	$I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time
		Maximum		2.5 Ω	25 Ω	35 Ω	
	Off state leakage current	Maximum	I_{Leak}	1 μA			$I_F = 5 \text{ mA}$ $V_L = \text{Max.}$
Transfer characteristics	Operate (OFF) time*	Typical	T_{off}	0.9 ms	0.52 ms	0.47 ms	$I_F = 0 \text{ mA} \rightarrow 5 \text{ mA}$ $I_L = \text{Max.}$
		Maximum		3 ms	1 ms		
	Reverse (ON) time*	Typical	T_{on}	0.21 ms	0.23 ms	0.28 ms	$I_F = 5 \text{ mA} \rightarrow 0 \text{ mA}$ $I_L = \text{Max.}$
		Maximum		1 ms	1 ms		
	I/O capacitance	Typical	C_{iso}	0.8 pF			f = 1 MHz $V_B = 0 \text{ V}$
Maximum		1.5 pF					
	Initial I/O isolation resistance	Minimum	R_{iso}	1,000 M Ω			500 V DC

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

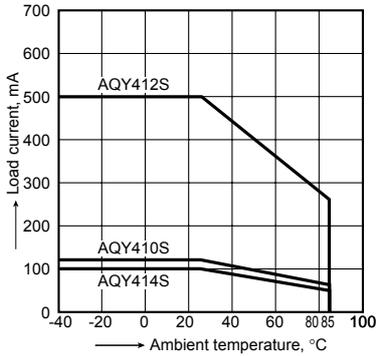
*Operate/Reverse time



REFERENCE DATA

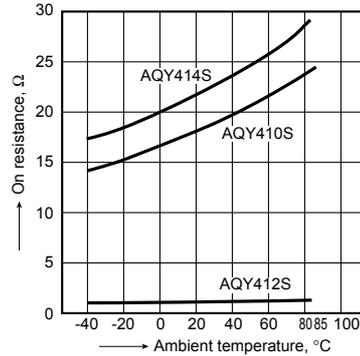
1. Load current vs. ambient temperature characteristics

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



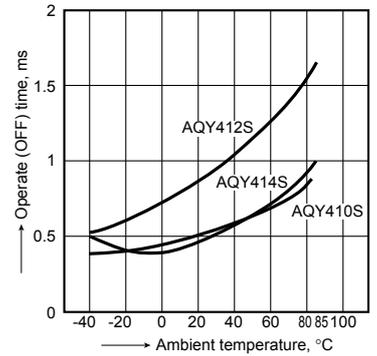
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4;
 LED current: 0 mA;
 Continuous load current: Max.(DC)



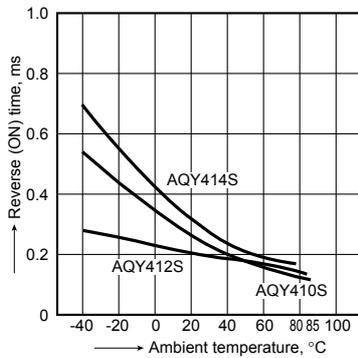
3. Operate (OFF) time vs. ambient temperature characteristics

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



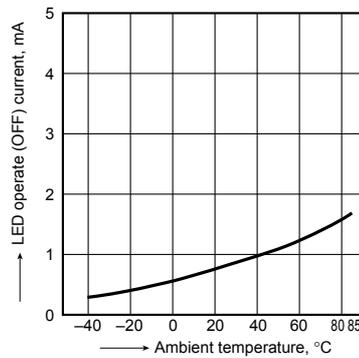
4. Reverse (ON) time vs. ambient temperature characteristics

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



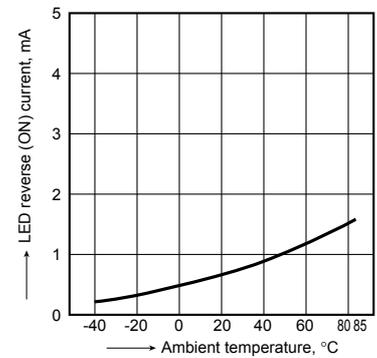
5. LED operate (OFF) current vs. ambient temperature characteristics

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



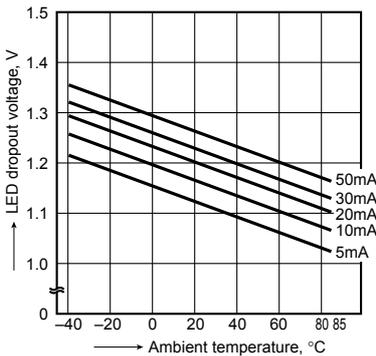
6. LED reverse (ON) current vs. ambient temperature characteristics

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



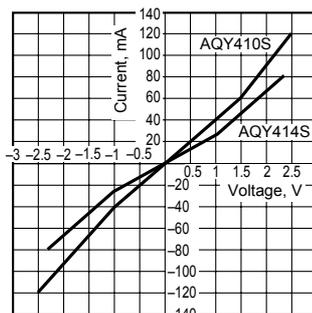
7. LED dropout voltage vs. ambient temperature characteristics

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



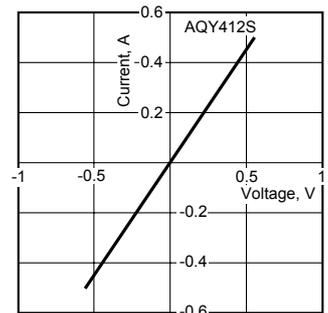
8-(1). Current vs. voltage characteristics of output at MOS portion

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



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

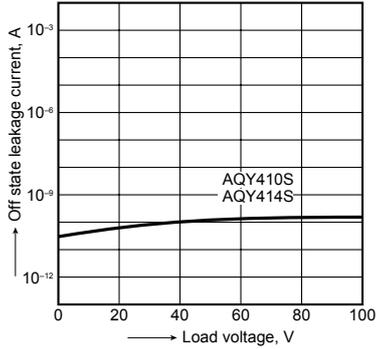
Measured portion: between terminals 3 and 4;
 Ambient temperature: 25°C 77°F



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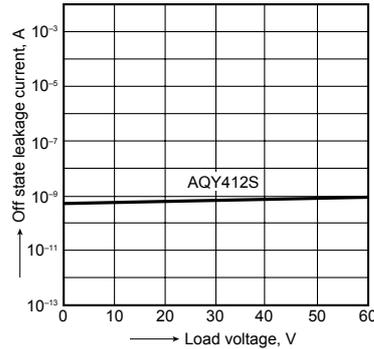
9-(1). Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4;
LED current: 5 mA; Ambient temperature: 25°C 77°F



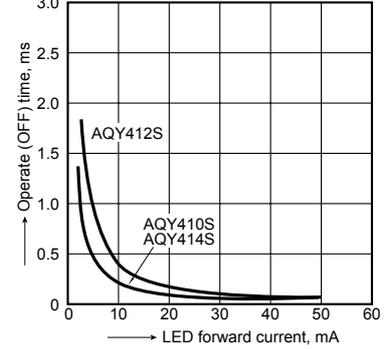
9-(2). Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4;
LED current: 5 mA; Ambient temperature: 25°C 77°F



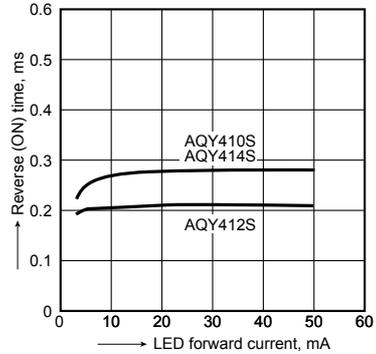
10. Operate (OFF) time vs. LED forward current characteristics

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



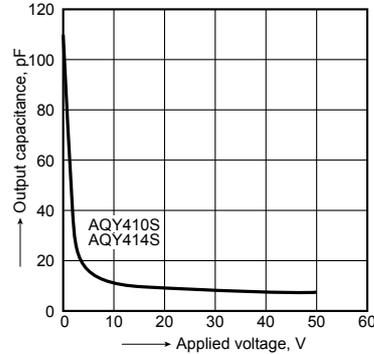
11. Reverse (ON) time vs. LED forward current characteristics

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



12-(1). Output capacitance vs. applied voltage characteristics

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



12-(2). Output capacitance vs. applied voltage characteristics

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

