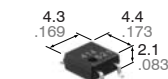
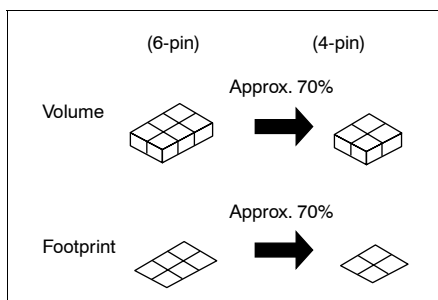
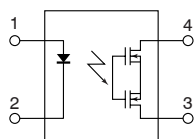


**Super miniature design,  
SOP (1 Form B) 4-pin type.  
Controls load voltage  
60V, 350V, 400V.**

# GU PhotoMOS (AQY410S)

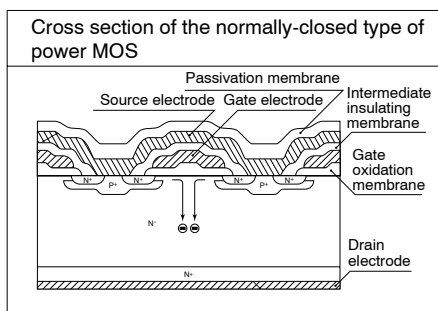


mm inch



**3. Normally closed type (1 Form B) is low on-resistance.**  
**(All AQ04 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.



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

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

**6. 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
Part No.	AQY410S	AQY412S
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 SO package 6-pin type PhotoMOS relays.

## TYPICAL APPLICATIONS

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

## TYPES

Type	Output rating*		Package size	Part No.			Packing quantity	
	Load voltage	Load current		Tube packing style	Tape and reel packing style		Tube	Tape and reel
AC/DC type	60V	500mA	SOP4pin	AQY412S	AQY412SX (Picked from the 1/2-pin side)	AQY412SZ (Picked from the 3/4-pin side)	1 tube contains: 100 pcs. 1 batch contains: 2,000 pcs.	1,000 pcs.
	350V	120mA		AQY410S	AQY410SX (Picked from the 1/2-pin side)	AQY410SZ (Picked from the 3/4-pin side)		
	400V	100mA		AQY414S	AQY414SX (Picked from the 1/2-pin side)	AQY414SZ (Picked from the 3/4-pin side)		

\* Indicate the peak AC and DC values.

Note: For space reasons, the initial letters of the part number "AQY", the SMD terminal shape indicator "S" and the packaging style indicator "X" or "Z" are not marked on the relay. (Ex. the label for product number AQY414S is 414)

# GU PhotoMOS (AQY410S)

## 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			

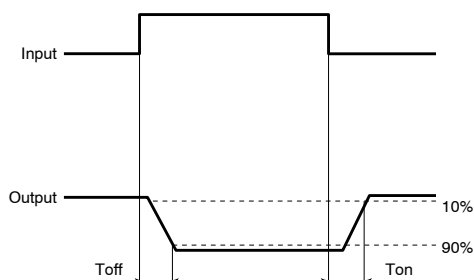
#### 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

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

Note: Recommendable LED forward current  $I_F = 5 mA$ .

Type of connection

\*Operate/Reverse time

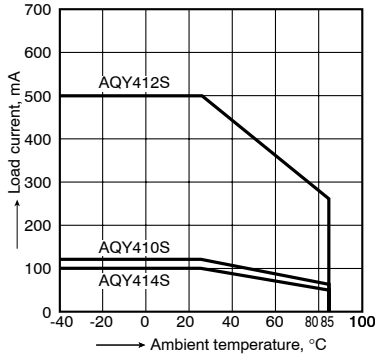


- Dimensions
- Schematic and Wiring Diagrams
- Cautions for Use

## REFERENCE DATA

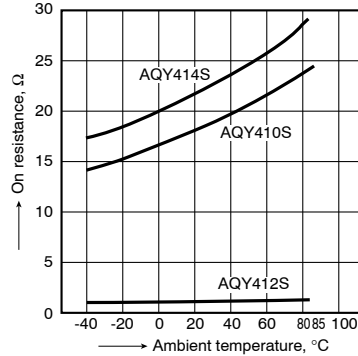
### 1. Load current vs. ambient temperature characteristics

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



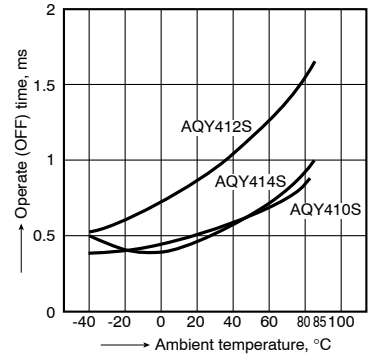
### 2. On resistance vs. ambient temperature characteristics

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



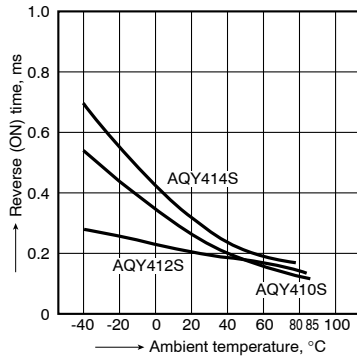
### 3. Operate (OFF) time vs. ambient temperature characteristics

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



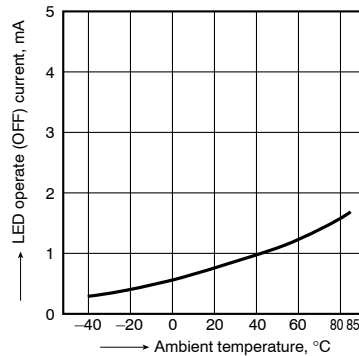
### 4. Reverse (ON) time vs. ambient temperature characteristics

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



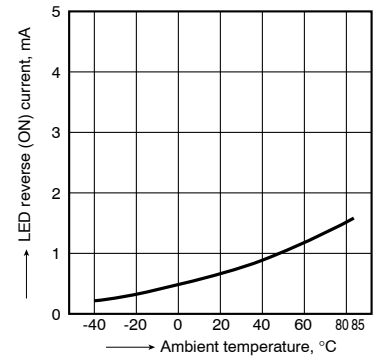
### 5. LED operate (OFF) current vs. ambient temperature characteristics

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



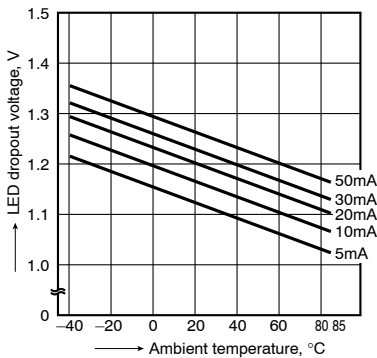
### 6. LED reverse (ON) current vs. ambient temperature characteristics

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



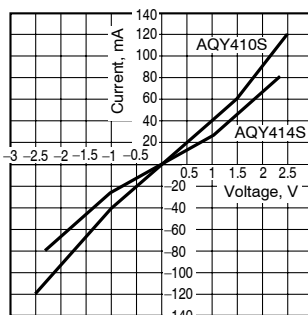
### 7. LED dropout voltage vs. ambient temperature characteristics

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



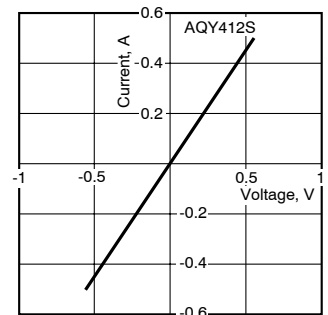
### 8-(1). Current vs. voltage characteristics of output at MOS portion

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



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

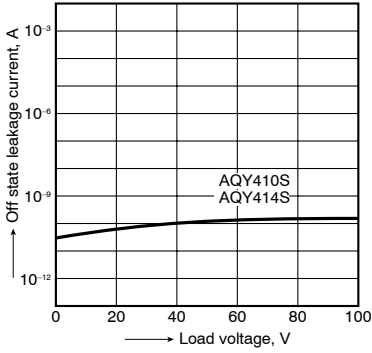
Measured portion: between terminals 3 and 4;  
 Ambient temperature: 25°C 77°F



# GU PhotoMOS (AQY41○S)

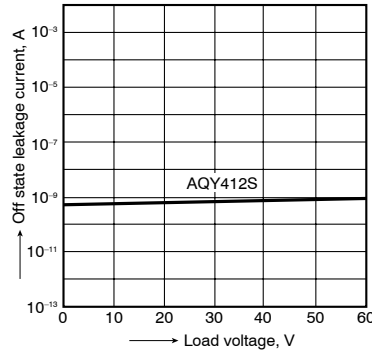
9-(1). Off state leakage current vs. load voltage characteristics

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



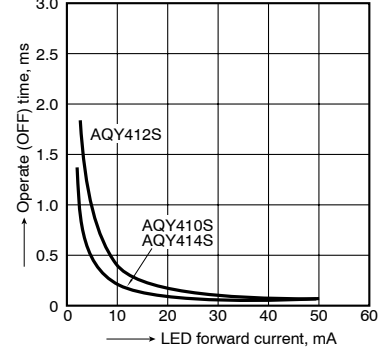
9-(2). Off state leakage current vs. load voltage characteristics

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



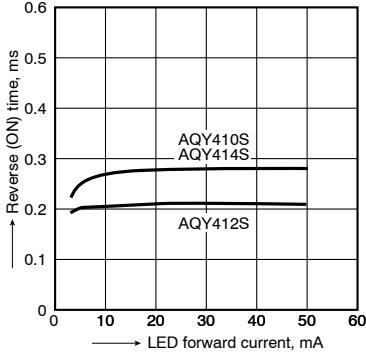
10. Operate (OFF) time vs. LED forward current characteristics

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



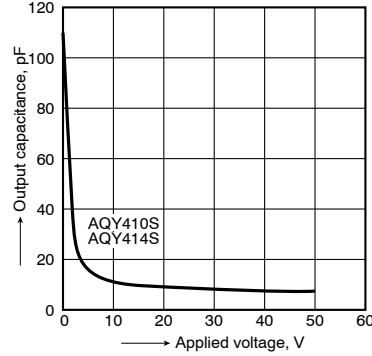
11. Reverse (ON) time vs. LED forward current characteristics

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

