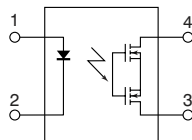
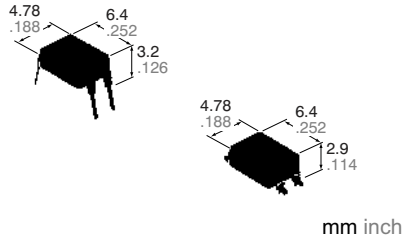


General use and economy type.  
DIP (1 Form A) 4-pin type.  
Reinforced insulation  
5,000V type.

## GU-E PhotoMOS (AQY210EH)



### FEATURES

#### 1. Reinforced insulation 5,000 V type

More than 0.4 mm internal insulation distance between inputs and outputs. Con-forms to EN41003, EN60950 (reinforced insulation).

#### 2. Compact 4-pin DIP size

The device comes in a compact (W)6.4×(L)4.78×(H)3.2mm (W).252×(L).188×(H).126inch, 4-pin DIP size.

#### 3. Controls low-level analog signals

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

#### 4. High sensitivity, low ON resistance

Can control a maximum 0.13 A load current with a 5 mA input current. Low ON resistance of 25Ω (AQY210EH).

Stable operation because there are no metallic contact parts.

#### 5. Low-level off state leakage current

The SSR has an off state leakage current of several milliamperes, whereas the PhotoMOS relay has typ. 100 pA even with the rated load voltage of 350 V (AQY210EH).

### TYPICAL APPLICATIONS

- Modem
- Telephone equipment
- Security equipment
- Sensors

### TYPES

Type	I/O isolation voltage	Output rating*		Part No.				Packing quantity	
				Through hole terminal	Surface-mount terminal		Tube	Tape and reel	
									Tube packing style
Load voltage	Load current		Picked from the 1/2-pin side	Picked from the 3/4-pin side					
AC/DC type	Reinforced 5,000 V	30 V	1,000 mA	AQY211EH	AQY211EHA	AQY211EHAX	AQY211EHAZ	1 tube contains 100 pcs. 1 batch contains 1,000 pcs.	1,000 pcs.
		60 V	550 mA	AQY212EH	AQY212EHA	AQY212EHAX	AQY212EHAZ		
		350 V	130 mA	AQY210EH	AQY210EHA	AQY210EHAX	AQY210EHAZ		
		400 V	120 mA	AQY214EH	AQY214EHA	AQY214EHAX	AQY214EHAZ		
		600 V	50 mA	AQY216EH	AQY216EHA	AQY216EHAX	AQY216EHAZ		

\*Indicate the peak AC and DC values.

Note: For space reasons, the initial letters of the part number "AQY", the SMD terminal shape indicator "A" and the package style indicator "X" or "Z" are not marked on the relay.

### RATING

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

Item		Symbol	AQY211EH(A)	AQY212EH(A)	AQY210EH(A)	AQY214EH(A)	AQY216EH(A)	Remarks
Input	LED forward current	I <sub>F</sub>	50mA					
	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>	75mW					
Output	Load voltage (peak AC)	V <sub>L</sub>	30 V	60 V	350 V	400 V	600 V	
	Continuous load current	I <sub>L</sub>	1 A	0.55 A	0.13 A	0.12 A	0.05 A	
	Peak load current	I <sub>peak</sub>	3 A	1.5 A	0.4 A	0.3 A	0.15 A	100 ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	500mW					
Total power dissipation		P <sub>T</sub>	550mW					
I/O isolation voltage		V <sub>iso</sub>	5,000 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-E PhotoMOS (AQY210EH)

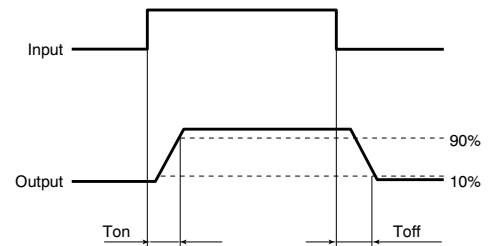
## 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	AQY211EH(A)	AQY212EH(A)	AQY210EH(A)	AQY214EH(A)	AQY216EH(A)	Condition
Input	LED operate current	Typical	I <sub>Fon</sub>	1.2mA					I <sub>L</sub> =Max.
		Maximum		3.0mA					
	LED turn off current	Minimum	I <sub>Foff</sub>	0.4mA					I <sub>L</sub> =Max.
		Typical		1.1mA					
LED dropout voltage	Typical	V <sub>F</sub>	1.25 (1.14 V at I <sub>F</sub> =5mA)					I <sub>F</sub> =50mA	
	Maximum		1.5V						
Output	On resistance	Typical	R <sub>on</sub>	0.25Ω	0.85Ω	18Ω	26Ω	52Ω	I <sub>F</sub> =5mA I <sub>L</sub> =Max. Within 1 s on time
		Maximum		0.5Ω	2.5Ω	25Ω	35Ω	120Ω	
	Off state leakage current	Maximum	I <sub>Leak</sub>	1μA					I <sub>F</sub> =0mA V <sub>L</sub> =Max.
Transfer characteristics	Turn on time*	Typical	T <sub>on</sub>	1.5ms	1ms	0.5ms		I <sub>F</sub> =5mA I <sub>L</sub> =Max.	
		Maximum		5ms	4ms	2.0ms			
	Turn off time*	Typical	T <sub>off</sub>	0.1ms	0.05ms	0.08ms		I <sub>F</sub> =5mA I <sub>L</sub> =Max.	
		Maximum		1.0ms					
	I/O capacitance	Typical	C <sub>iso</sub>	0.8pF					f = 1MHz V <sub>B</sub> = 0V
Maximum		1.5pF							
Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000MΩ					500V DC	

Note: Recommendable LED forward current I<sub>F</sub>=5 to 10mA.

Type of connection

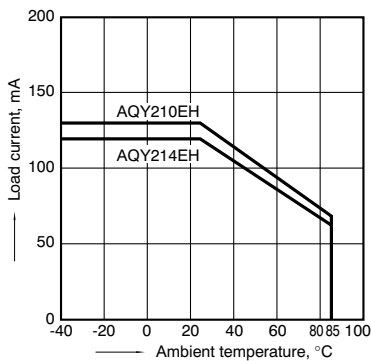
\*Turn on/Turn off time



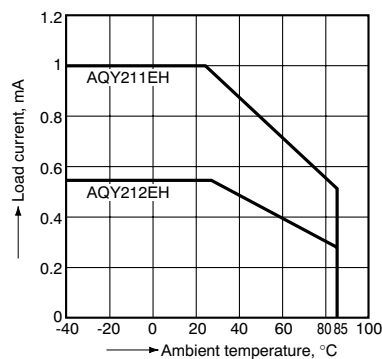
- Dimensions
- Schematic and Wiring Diagrams
- Cautions for Use

## REFERENCE DATA

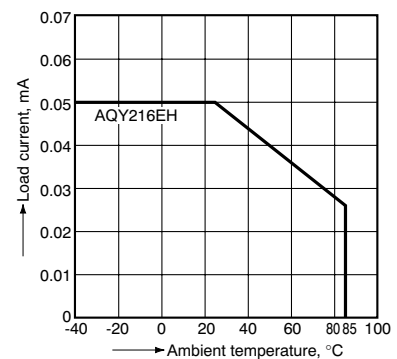
1-(1). Load current vs. ambient temperature characteristics  
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F



1-(2). Load current vs. ambient temperature characteristics  
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F

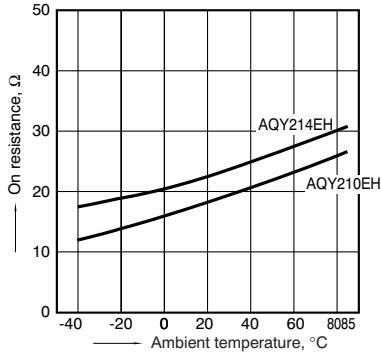


1-(3). Load current vs. ambient temperature characteristics  
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F



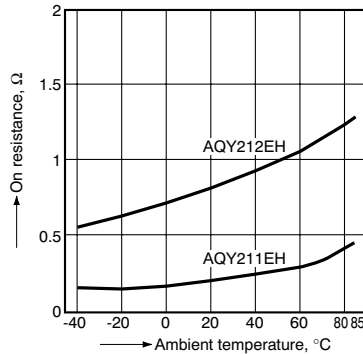
2-(1). On resistance vs. ambient temperature characteristics

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



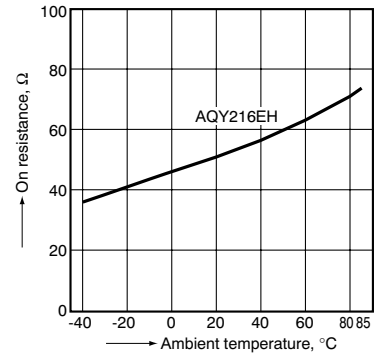
2-(2). On resistance vs. ambient temperature characteristics

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



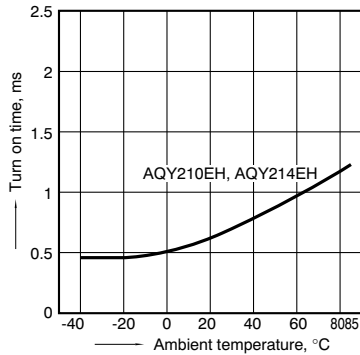
2-(3). On resistance vs. ambient temperature characteristics

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



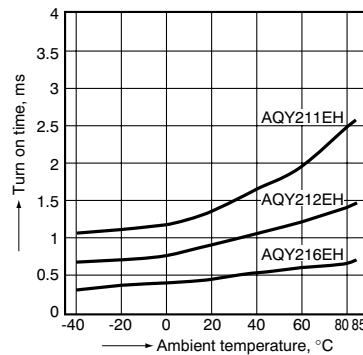
3-(1). Turn on time vs. ambient temperature characteristics

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



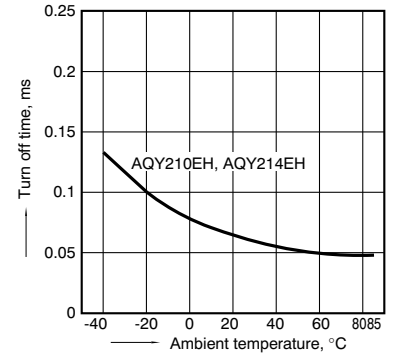
3-(2). Turn on time vs. ambient temperature characteristics

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



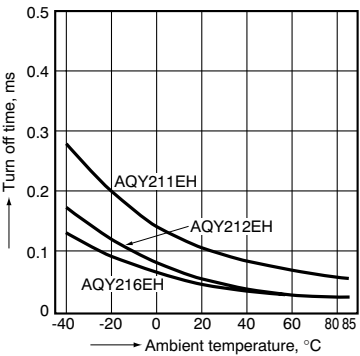
4-(1). Turn off time vs. ambient temperature characteristics

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



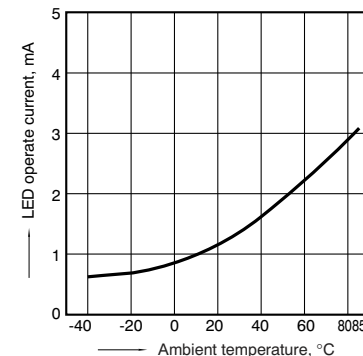
4-(2). Turn off time vs. ambient temperature characteristics

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



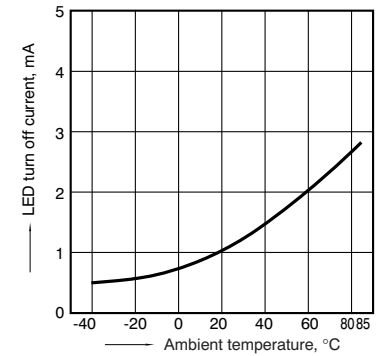
5. LED operate current vs. ambient temperature characteristics

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



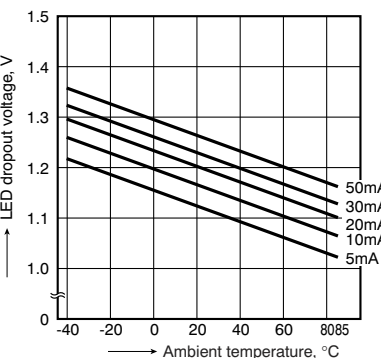
6. LED turn off current vs. ambient temperature characteristics

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



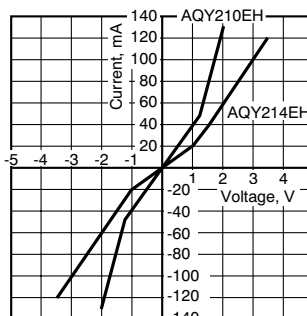
7. LED dropout voltage vs. ambient temperature characteristics

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



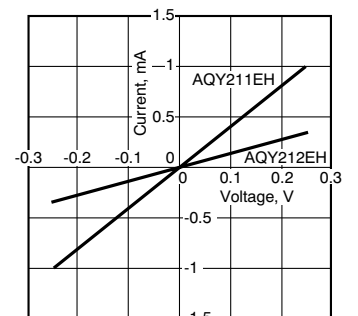
8-(1). Current vs. voltage characteristics of output at MOS portion

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



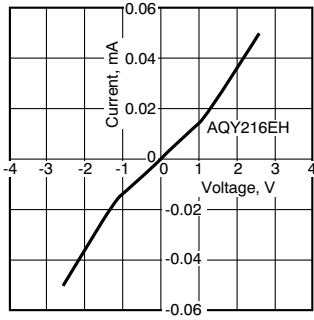
8-(2). Current vs. voltage characteristics of output at MOS portion

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

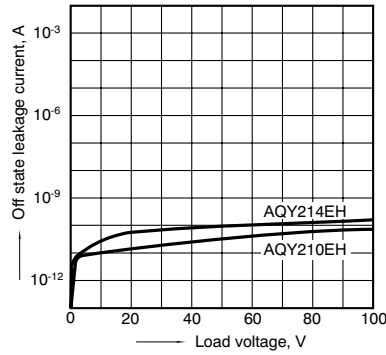


# GU-E PhotoMOS (AQY210EH)

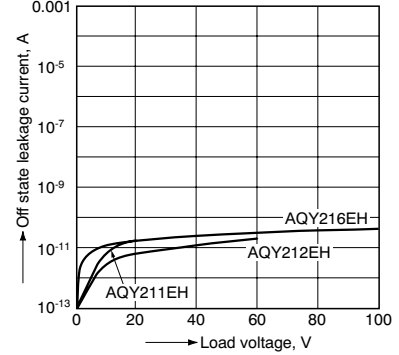
8-(3). Current vs. voltage characteristics of output at MOS portion  
 Measured portion: between terminals 3 and 4;  
 Ambient temperature: 25°C 77°F



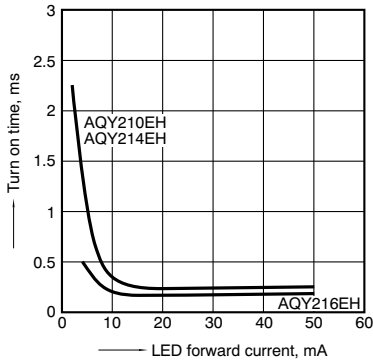
9-(1). Off state leakage current vs. load voltage characteristics  
 Measured portion: between terminals 3 and 4;  
 Ambient temperature: 25°C 77°F



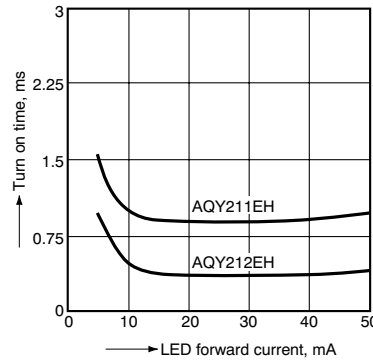
9-(2). Off state leakage current vs. load voltage characteristics  
 Measured portion: between terminals 3 and 4;  
 Ambient temperature: 25°C 77°F



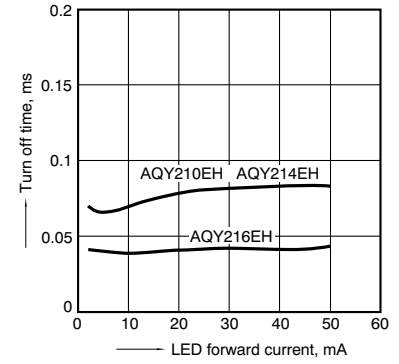
10-(1). Turn on time vs. LED forward current characteristics  
 Measured portion: between terminals 3 and 4;  
 Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



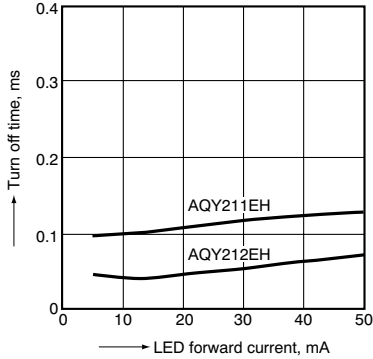
10-(2). Turn on time vs. LED forward current characteristics  
 Measured portion: between terminals 3 and 4;  
 Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



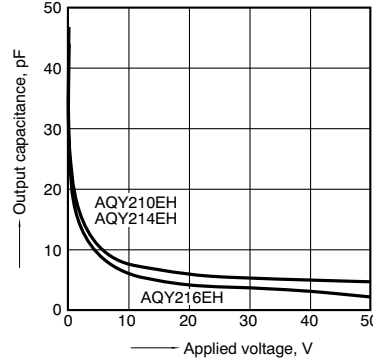
11-(1). Turn off time vs. LED forward current characteristics  
 Measured portion: between terminals 3 and 4;  
 Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



11-(2). 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-(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

