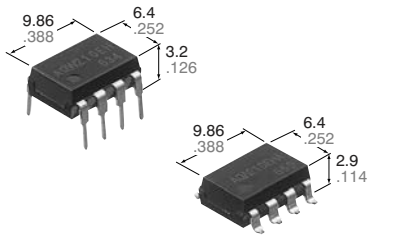
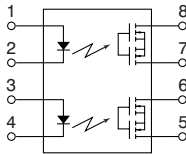


**General use and economy type.  
DIP (2 Form A) 8-pin type.  
Reinforced insulation  
5,000V type.**

# GU-E PhotoMOS (AQW210EH)



mm inch



## 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 8-pin DIP size

The device comes in a compact (W)6.4×(L)9.86×(H)3.2 mm (W).252×(L).388×(H).126 inch, 8-pin DIP size (through hole terminal type).

### 3. Applicable for 2 Form A use as well as two independent 1 Form A use

**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. High sensitivity, high speed response.

Can control a maximum 0.14 A load current with a 5 mA input current. Fast operation speed of 0.5 ms (typical). (AQW210EH)

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

## 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 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side					
AC/DC type	Reinforced 5,000 V	60 V	500 mA	AQW212EH	AQW212EHA	AQW212EHAX	AQW212EHAZ	1 tube contains 40 pcs. 1 batch contains 400 pcs.	1,000 pcs.
		350 V	120 mA	AQW210EH	AQW210EHA	AQW210EHAX	AQW210EHAZ		
		400 V	100 mA	AQW214EH	AQW214EHA	AQW214EHAX	AQW214EHAZ		
		600 V	40 mA	AQW216EH	AQW216EHA	AQW216EHAX	AQW216EHAZ		

\*Indicate the peak AC and DC values.

Note: For space reasons, 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	AQW212EH(A)	AQW210EH(A)	AQW214EH(A)	AQW216EH(A)	Remarks
Input	LED forward current	I <sub>F</sub>	50mA				
	LED reverse voltage	V <sub>R</sub>	5V				
	Peak forward current	I <sub>FP</sub>	1A				f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75mW				
Output	Load voltage (peak AC)	V <sub>L</sub>	60 V	350 V	400 V	600 V	
	Continuous load current (peak AC)	I <sub>L</sub>	0.5 A (0.6 A)	0.12 A (0.14 A)	0.1 A (0.13 A)	0.04 A (0.05 A)	Peak AC, DC ( ): in case of using only 1 channel
	Peak load current	I <sub>peak</sub>	1.5 A	0.36 A	0.3 A	0.15 A	100 ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	800mW				
Total power dissipation		P <sub>T</sub>	850mW				
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 (AQW210EH)

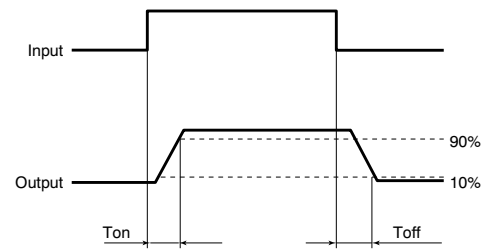
## 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item		Symbol	AQW212EH(A)	AQW210EH(A)	AQW214EH(A)	AQW216EH(A)	Condition
Input	LED operate current	Typical	1.2mA				$I_L = \text{Max.}$
		Maximum	3.0mA				
	LED turn off current	Minimum	0.4mA				$I_L = \text{Max.}$
		Typical	1.1mA				
LED dropout voltage	Typical	1.25 V (1.14 V at $I_F = 5\text{mA}$ )				$I_F = 50\text{mA}$	
	Maximum	1.5V					
Output	On resistance	Typical	0.83Ω	18Ω	26Ω	52Ω	$I_F = 5\text{mA}$ $I_L = \text{Max.}$ Within 1 s on time
		Maximum	2.5Ω	25Ω	35Ω	120Ω	
	Off state leakage current	Maximum	1μA				$I_F = 0\text{mA}$ $V_L = \text{Max.}$
Transfer characteristics	Turn on time*	Typical	1ms	0.5ms			$I_F = 5\text{mA}$ $I_L = \text{Max.}$
		Maximum	4ms	2.0ms			
	Turn off time*	Typical	0.08ms			0.04ms	$I_F = 5\text{mA}$ $I_L = \text{Max.}$
		Maximum	1.0ms				
	I/O capacitance	Typical	0.8pF				$f = 1\text{MHz}$ $V_B = 0\text{V}$
		Maximum	1.5pF				
Initial I/O isolation resistance	Minimum	1,000MΩ				500V DC	

Note: Recommendable LED forward current  $I_F = 5$  to 10mA.

Type of connection

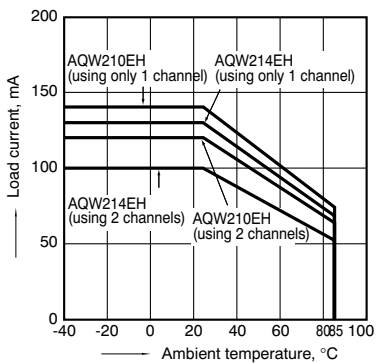
\*Turn on/Turn off time



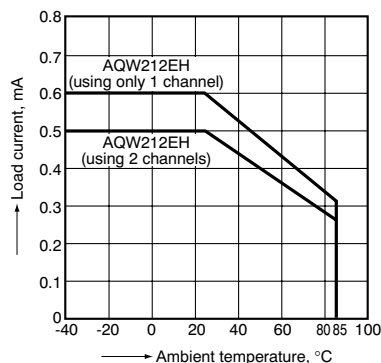
- Dimensions
- Schematic and Wiring Diagrams
- Cautions for Use

## REFERENCE DATA

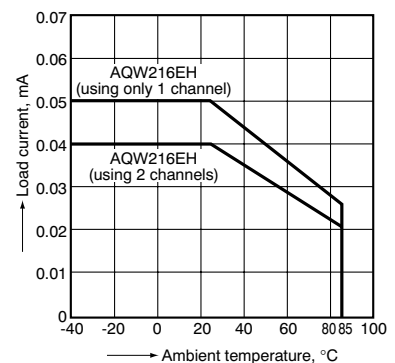
1-(1). Load current vs. ambient temperature characteristics  
Allowable ambient temperature: -20°C to +85°C  
-4°F to +185°F



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



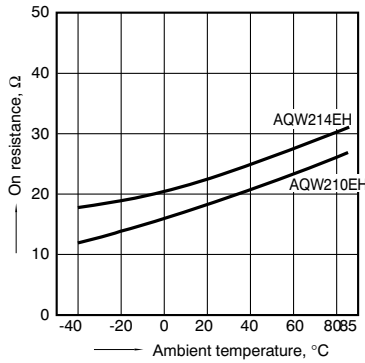
1-(3). Load current vs. ambient temperature characteristics  
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F



# GU-E PhotoMOS (AQW210EH)

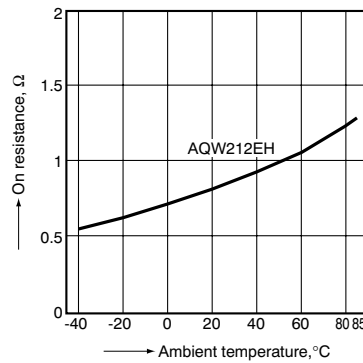
## 2-(1). On resistance vs. ambient temperature characteristics

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



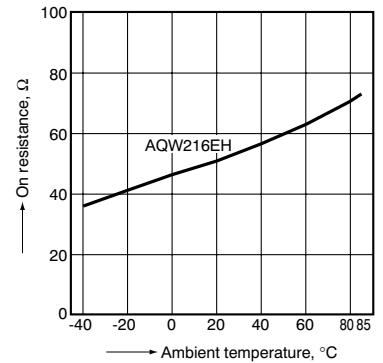
## 2-(2). On resistance vs. ambient temperature characteristics

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



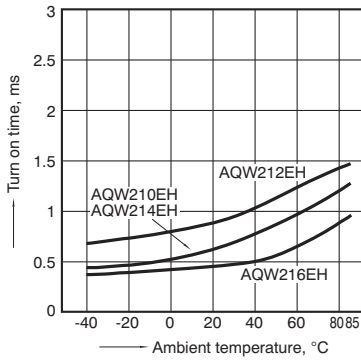
## 2-(3). On resistance vs. ambient temperature characteristics

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



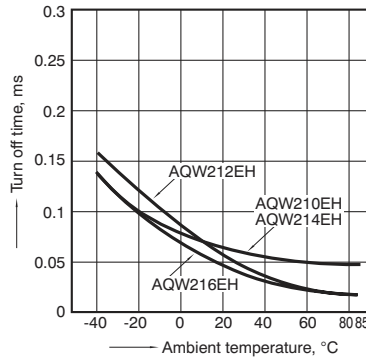
## 3. Turn on time vs. ambient temperature characteristics

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



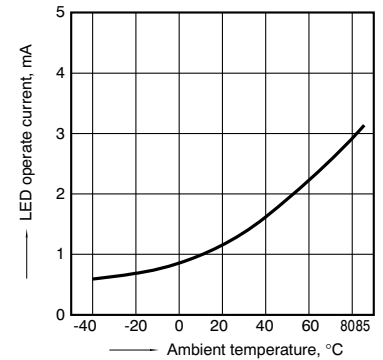
## 4. Turn off time vs. ambient temperature characteristics

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



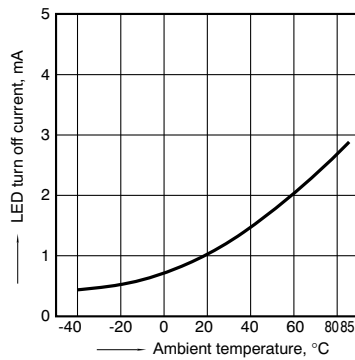
## 5. LED operate current vs. ambient temperature characteristics

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



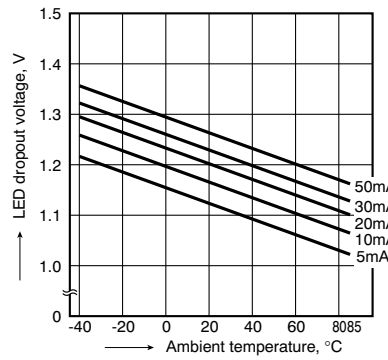
## 6. LED turn off current vs. ambient temperature characteristics

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



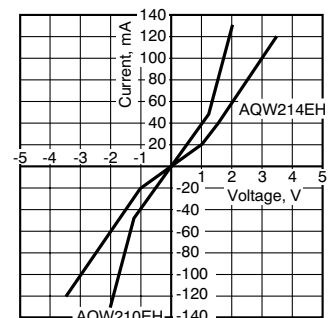
## 7. LED dropout voltage vs. ambient temperature characteristics

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



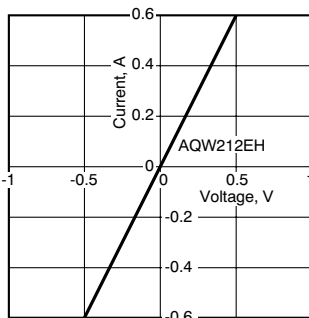
## 8-(1). Current vs. voltage characteristics of output at MOS portion

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



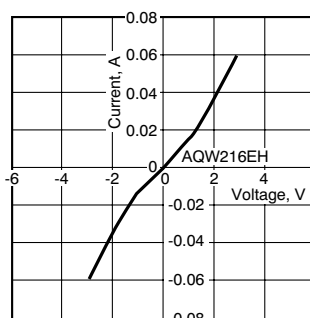
## 8-(2). Current vs. voltage characteristics of output at MOS portion

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



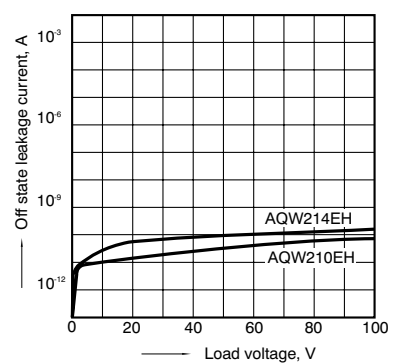
## 8-(3). Current vs. voltage characteristics of output at MOS portion

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



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

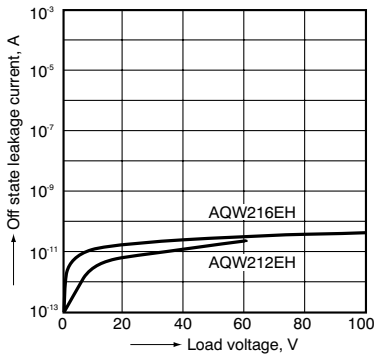
Measured portion: between terminals 5 and 6, 7 and 8;  
Ambient temperature: 25°C 77°F



# GU-E PhotoMOS (AQW210EH)

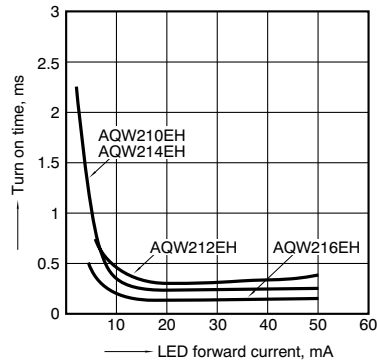
## 9-(2). Off state leakage current vs. load voltage characteristics

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



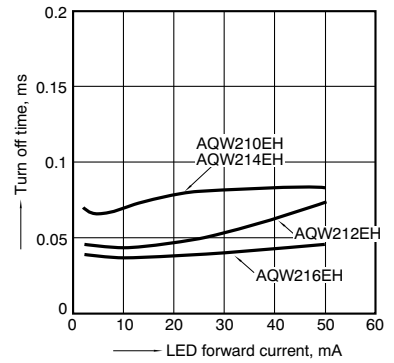
## 10. Turn on time vs. LED forward current characteristics

Sample: All types  
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



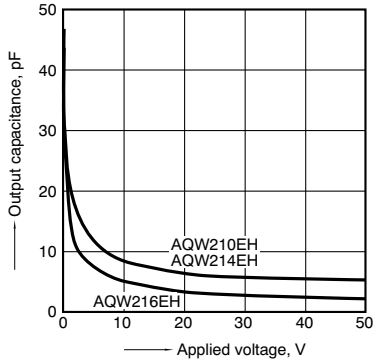
## 11. Turn off time vs. LED forward current characteristics

Sample: All types  
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-(1). Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8;  
Frequency: 1 MHz; Ambient temperature: 25°C 77°F



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

Measured portion: between terminals 5 and 6, 7 and 8;  
Frequency: 1 MHz; Ambient temperature: 25°C 77°F

