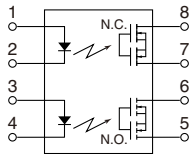
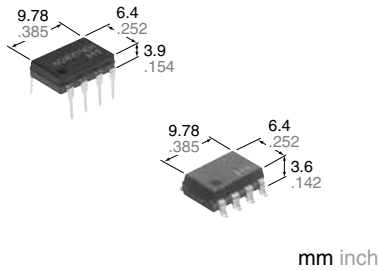




**Both NO and NC contacts incorporated in a compact DIP8-pin Reinforced insulation**

**PhotoMOS®  
GE 1 Form A & 1 Form B (AQW610EH)**



**RoHS compliant**

### FEATURES

1. 60V type couples high capacity (0.5A) with low on-resistance (typ. 1Ω).
2. Reinforced insulation 5,000 V  
More than 0.4 mm internal insulation distance between inputs and outputs. Conforms to EN41003, EN60950 (reinforced insulation).
3. Approx. 1/2 the space compared with the mounting area of a set of 1 Form A and 1 Form B PhotoMOS
4. Applicable for 1 Form A and 1 Form B use as well as two independent 1 Form A and 1 Form B use
5. Controls low-level analog signals  
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

### 6. High sensitivity and high speed response

Can control max. 0.14 A load current with 5 mA input current. Fast operation speed of typ. 0.5 ms [N.O.] (AQW610EH).

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

### TYPICAL APPLICATIONS

- Power supply
- Measuring instruments
- Security equipment
- Modem
- Telephone equipment
- Electricity, plant equipment
- Sensing equipment

### TYPES

	I/O isolation voltage	Output rating*		Package	Part No.				Packing quantity	
					Through hole terminal	Surface-mount terminal		Tape and reel packing style		Tube
		Tube packing style				Picked from the 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side			
		Load voltage	Load current							
AC/DC dual use	Reinforced 5,000 V	60 V	500 mA	DIP8-pin	AQW612EH	AQW612EHA	AQW612EHAX	AQW612EHAZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs.
		350 V	120 mA		AQW610EH	AQW610EHA	AQW610EHAX	AQW610EHAZ		
		400 V	100 mA		AQW614EH	AQW614EHA	AQW614EHAX	AQW614EHAZ		

\*Indicate the peak AC and DC values.

Note: The surface mount terminal shape indicator "A" and the packing style indicator "X" or "Z" are not marked on the device.

### RATING

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

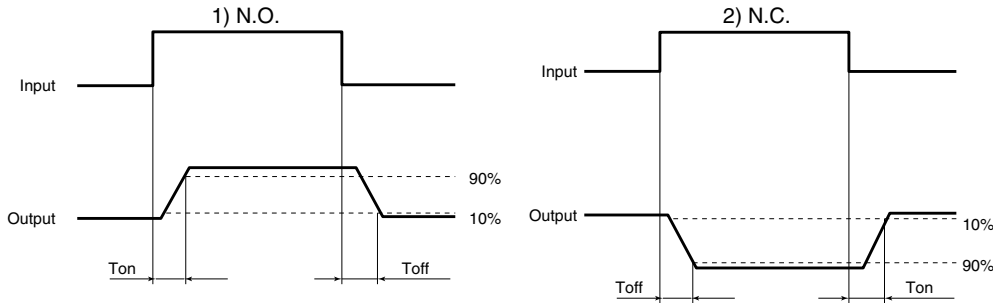
Item		Symbol	AQW612EH(A)	AQW610EH(A)	AQW614EH(A)	Remarks
Input	LED forward current	I <sub>F</sub>	50 mA			
	LED reverse voltage	V <sub>R</sub>	5 V			
	Peak forward current	I <sub>FP</sub>	1 A			f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P <sub>in</sub>	75 mW			
Output	Load voltage (peak AC)	V <sub>L</sub>	60 V	350 V	400 V	
	Continuous load current	I <sub>L</sub>	0.5 A (0.6 A)	0.12 A (0.14 A)	0.1 A (0.13 A)	Peak AC, DC ( ): in case of using only 1a or 1b, 1 channel
	Peak load current	I <sub>peak</sub>	1.5 A	0.36 A	0.3 A	100 ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	800 mW			
Total power dissipation		P <sub>T</sub>	850 mW			
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			

# GE 1 Form A & 1 Form B (AQW610EH)

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

Item		Symbol	AQW612EH(A)	AQW610EH(A)	AQW614EH(A)	Condition
Input	LED operate current	Typical	1.4 mA			I <sub>L</sub> =Max.
		Maximum	3.0 mA			
	LED reverse current	Minimum	0.4 mA			I <sub>L</sub> =Max.
		Typical	1.3 mA			
LED dropout voltage	Typical	1.25 (1.14 V at I <sub>F</sub> = 5 mA)			I <sub>F</sub> =50 mA	
	Maximum	1.5 V				
Output	On resistance	Typical	1Ω	18Ω	26Ω	I <sub>F</sub> =5mA (N.O.) I <sub>F</sub> = 0mA (N.C.) I <sub>L</sub> = Max. Within 1 s on time
		Maximum	2.5Ω	25Ω	35Ω	
	Off state leakage current	Maximum	1μA (N.O.), 10μA (N.C.)			I <sub>F</sub> =0 mA (N.O.) I <sub>F</sub> = 5 mA (N.C.) V <sub>L</sub> = Max.
Transfer characteristics	Operate time*	Typical	T <sub>on</sub> (N.O.) 1.0 ms (N.O.) 3.0 ms (N.C.)	0.5 ms (N.O.) 1.0 ms (N.C.)	0.5 ms (N.O.) 0.8 ms (N.C.)	I <sub>F</sub> = 0 mA → 5 mA I <sub>L</sub> = Max.
		Maximum	T <sub>off</sub> (N.C.) 4.0 ms (N.O.) 10.0 ms (N.C.)	3.0 ms		
	Reverse time*	Typical	T <sub>off</sub> (N.O.) 0.05ms (N.O.) 0.2ms (N.C.)	0.08ms (N.O.) 0.3ms (N.C.)	0.08ms (N.O.) 0.2ms (N.C.)	I <sub>F</sub> = 5 mA → 0 mA I <sub>L</sub> = Max.
		Maximum	1.0ms			
	I/O capacitance	Typical	C <sub>iso</sub>	0.8 pF		f = 1MHz
	Maximum		1.5 pF		V <sub>B</sub> = 0 V	
	Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000MΩ		500 V DC

\*Operate/Reverse 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 <sub>F</sub>	5 to 10	mA

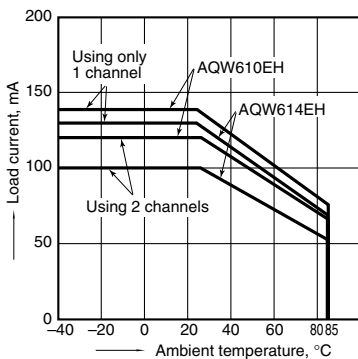
■ These products are not designed for automotive use.

If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

## REFERENCE DATA

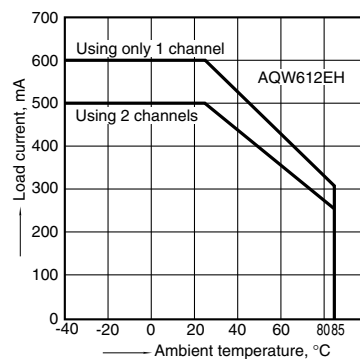
1-(1). Load current vs. ambient temperature characteristics

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



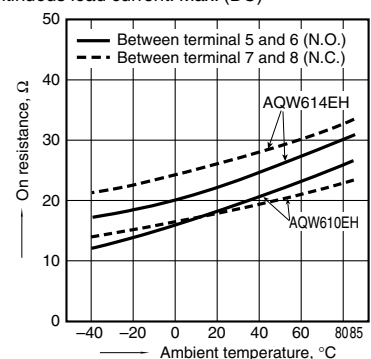
1-(2). Load current vs. ambient temperature characteristics

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



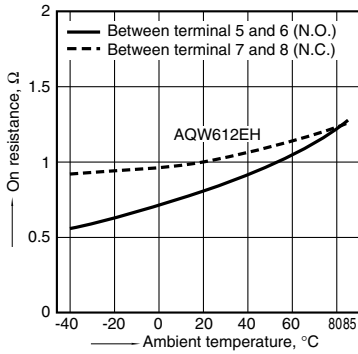
2-(1). On resistance vs. ambient temperature characteristics

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



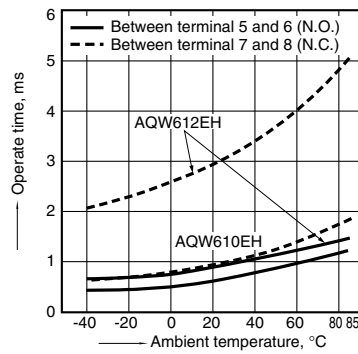
2-(2). On resistance vs. ambient temperature characteristics

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



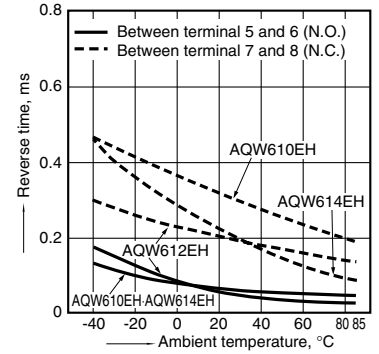
3. Operate time vs. ambient temperature characteristics

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



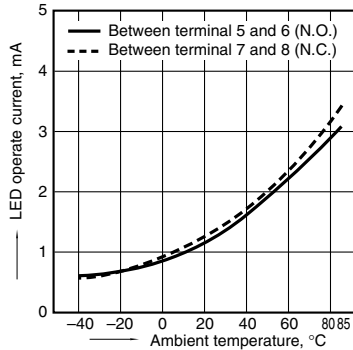
4. Reverse time vs. ambient temperature characteristics

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



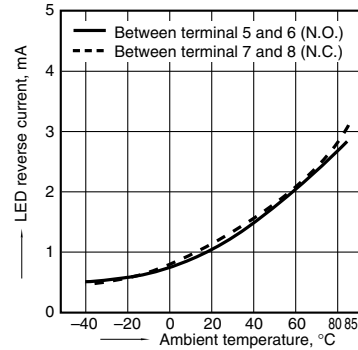
5. LED operate current vs. ambient temperature characteristics

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



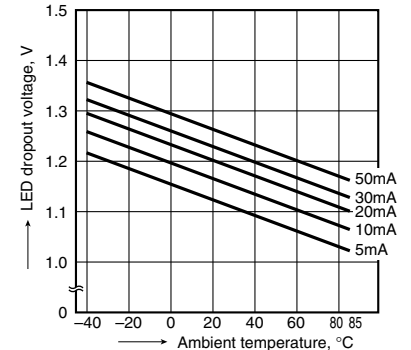
6. LED reverse current vs. ambient temperature characteristics

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



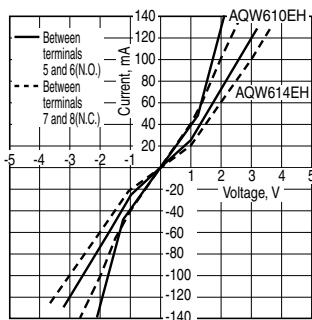
7. LED dropout voltage vs. ambient temperature characteristics

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



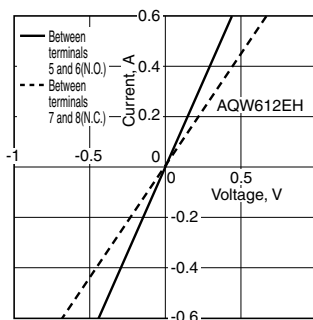
8-(1). Current vs. voltage characteristics of output at MOS portion

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



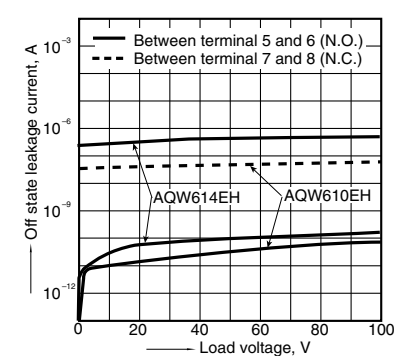
8-(2). Current vs. voltage characteristics of output at MOS portion

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



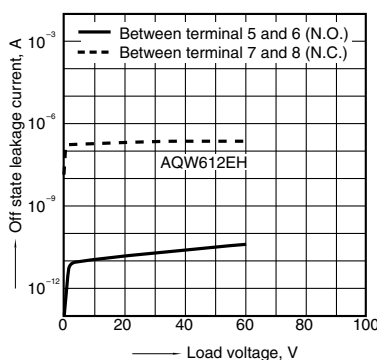
9-(1). Off state leakage current vs. load voltage characteristics

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



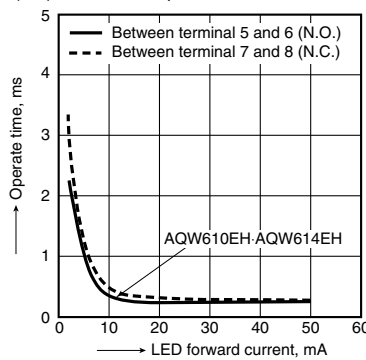
9-(2). Off state leakage current vs. load voltage characteristics

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



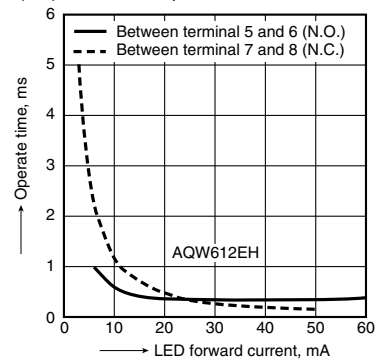
10-(1). Operate time vs. LED forward current characteristics

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



10-(2). Operate time vs. LED forward current characteristics

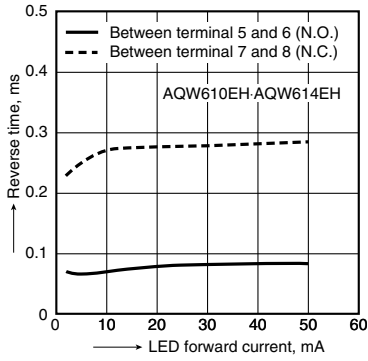
Measured portion: between terminals 5 and 6, 7 and 8;  
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



# GE 1 Form A & 1 Form B (AQW61EH)

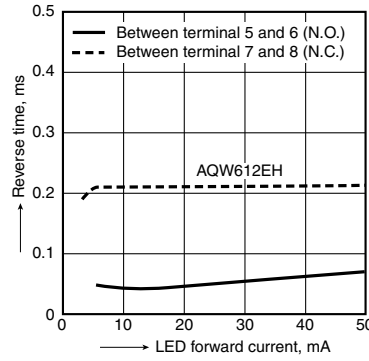
## 11-(1). Reverse time vs. LED forward current characteristics

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



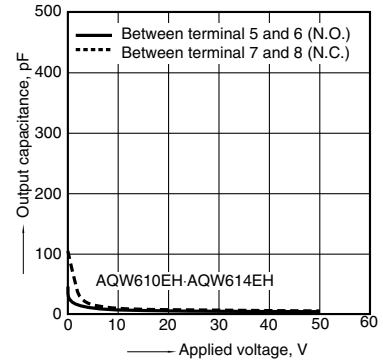
## 11-(2). Reverse time vs. LED forward current characteristics

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

