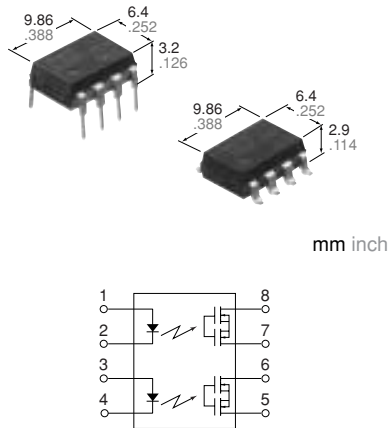


**Panasonic**  
ideas for life

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

**GU-E PhotoMOS  
(AQW414EH)**



## 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 B use as well as two independent 1 Form B 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 0.13 A load current with a 5 mA input current. Fast operation speed of 0.8 ms (typical).

**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	400 V	100 mA	AQW414EH	AQW414EHA	AQW414EHAX	AQW414EHAZ	1 tube contains 40 pcs. 1 batch contains 400 pcs.	1,000 pcs.

\*Indicate the peak AC and DC values.

Note:

For space reasons, the SMD terminal shape indicator "A" and the package type indicator "X" and "Z" are omitted from the seal.

## RATING

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

Item		Symbol	AQW414EH (A)	Remarks
Input	LED forward current	$I_F$	50mA	
	LED reverse voltage	$V_R$	5V	
	Peak forward current	$I_{FP}$	1A	$f = 100$ Hz, Duty factor = 0.1%
	Power dissipation	$P_{in}$	75mW	
Output	Load voltage (peak AC)	$V_L$	400 V	
	Continuous load current	$I_L$	0.1 A (0.13 A)	Peak AC, DC ( ): in case of using only 1 channel.
	Peak load current	$I_{peak}$	0.3 A	100 ms (1 shot), $V_L = DC$
	Power dissipation	$P_{out}$	800mW	
Total power dissipation		$P_T$	850mW	
I/O isolation voltage		$V_{iso}$	5,000 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	

# GU-E PhotoMOS (AQW414EH)

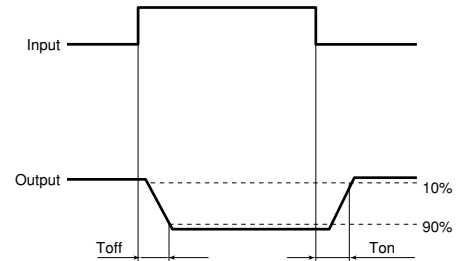
## 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item		Symbol	AQW414EH (A)	Condition		
Input	LED operate (OFF) current	Typical	1.3mA	$I_L = \text{Max.}$		
		Maximum	3.0mA			
	LED reverse (ON) current	Minimum	0.4mA	$I_L = \text{Max.}$		
		Typical	1.2mA			
LED dropout voltage	Typical	$V_F$	1.25 (1.14 V at $I_F = 5\text{mA}$ )	$I_F = 50\text{mA}$		
	Maximum		1.5V			
Output	On resistance	Typical	$R_{\text{on}}$	$I_F = 0\text{mA}$ $I_L = \text{Max.}$ Within 1 s on time		
		Maximum	35Ω			
	Off state leakage current	Maximum	$I_{\text{Leak}}$	10μA	$I_F = 5\text{mA}$ $V_L = \text{Max.}$	
Transfer characteristics	Turn on time*	Typical	$T_{\text{off}}$	0.8ms	$I_F = 0\text{mA} \rightarrow 5\text{mA}$ $I_L = \text{Max.}$	
		Maximum				3.0ms
	Turn off time*	Typical	$T_{\text{on}}$	0.2ms	1.0ms	$I_F = 5\text{mA} \rightarrow 0\text{mA}$ $I_L = \text{Max.}$
		Maximum				
	I/O capacitance	Typical	$C_{\text{iso}}$	0.8pF	$f = 1\text{MHz}$ $V_B = 0\text{V}$	
		Maximum		1.5pF		
Initial I/O isolation resistance	Minimum	$R_{\text{iso}}$	1,000MΩ	500V DC		

Note: Recommendable LED forward current  $I_F = 5$  to  $10\text{mA}$ .

For type of connection

\*Operate/Reverse time

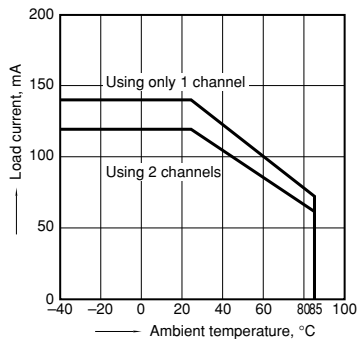


- For Dimensions
- For Schematic and Wiring Diagrams
- For Cautions for Use

## REFERENCE DATA

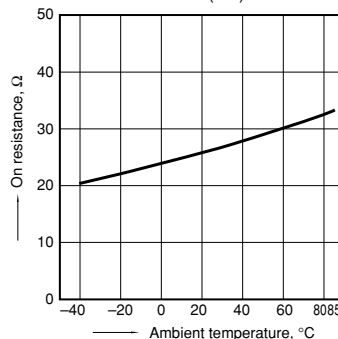
### 1. Load current vs. ambient temperature characteristics

Allowable ambient temperature:  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
 $-40^\circ\text{F}$  to  $+185^\circ\text{F}$



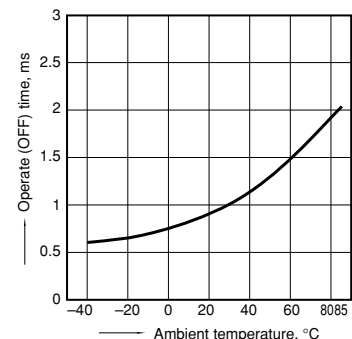
### 2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8;  
LED current: 0 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



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

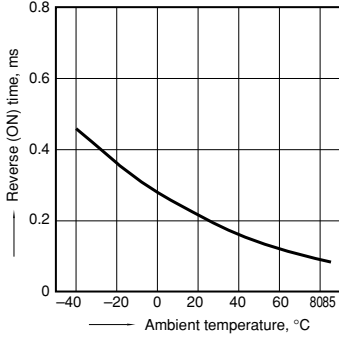
LED current: 5 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



# GU-E PhotoMOS (AQW414EH)

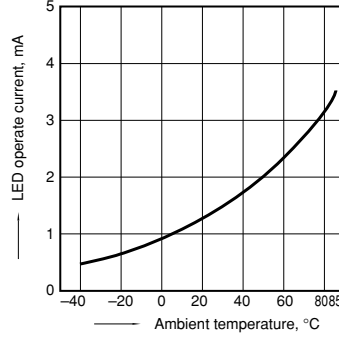
## 4. Reverse (ON) time vs. ambient temperature characteristics

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



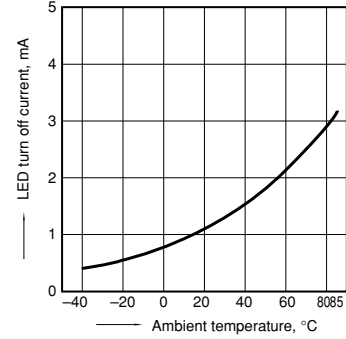
## 5. LED operate current vs. ambient temperature characteristics

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



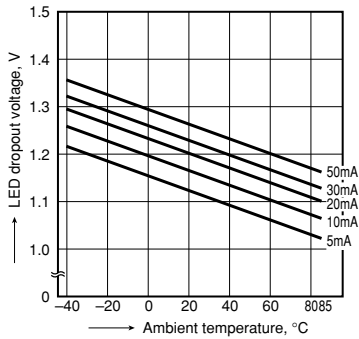
## 6. LED turn off current vs. ambient temperature characteristics

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



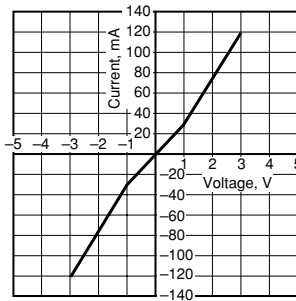
## 7. LED dropout voltage vs. ambient temperature characteristics;

LED current: 5 to 50 mA



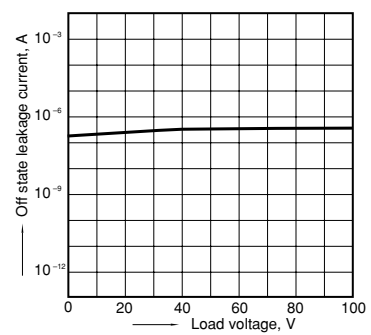
## 8. Current vs. voltage characteristics of output at MOS portion

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



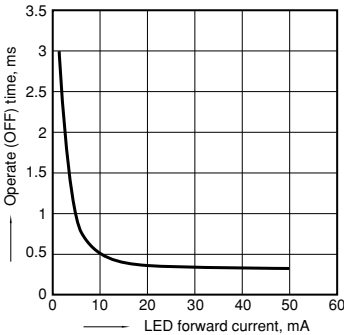
## 9. Off state leakage current vs. load voltage characteristics

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



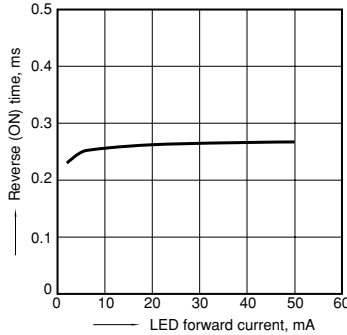
## 10. Operate (OFF) time vs. LED forward current characteristics

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. Reverse (ON) 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. 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

