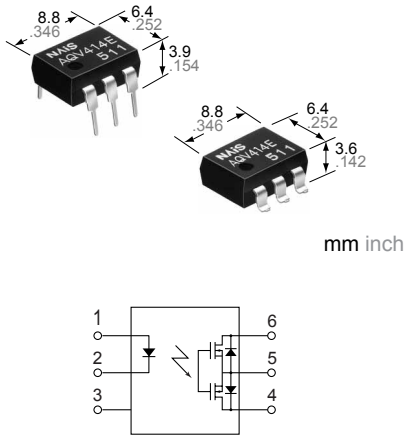


Panasonic
ideas for life

**General use and economy type.
DIP (1 Form B) 6-pin type.
Reinforced insulation
5,000V type.**

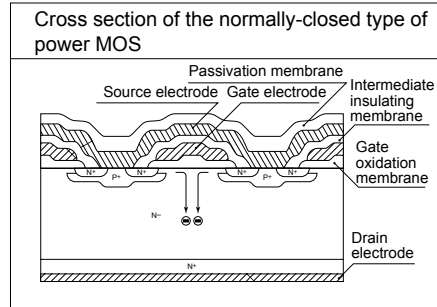
**GU-E PhotoMOS
(AQV414E,
AQV410EH)**



2. This is the low-cost version PhotoMOS 1 Form B output type relay. Compared to the previous GU PhotoMOS 1 Form B type relay, the attainment of an economical price that is approximately 22% lower will further broaden its market.

3. Normally closed type (2 Form B) is low on-resistance. (All AQ○4 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. 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, low ON resistance Can control a maximum 0.13 A load current with a 5 mA input current. Low ON resistance of 18 Ω (AQV410EH). Stable operation because there are no metallic contact parts.

6. 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 400 V (AQV414E).

7. Reinforced insulation 5,000 V type also available. More than 0.4 mm internal insulation distance between inputs and outputs. Conforms to EN41003, EN60950 (reinforced insulation).

FEATURES

1. 60V type couples high capacity (0.55A) with low on-resistance (1Ω).

Item	GU-E (1 Form B type) type	
	AQV410EH	AQV412EH
Part No.	AQV410EH	AQV412EH
Load voltage	350V	60V
Continuous load current	0.13A	0.55A
ON resistance (typ.)	18Ω	1Ω

NEW

TYPICAL APPLICATIONS

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

TYPES

Type	I/O isolation voltage	Output rating*		Part No.				Packing quantity	
				Through hole terminal	Surface-mount terminal				
		Load voltage	Load current	Tube packing style		Tape and reel packing style		Tube	Tape and reel
		Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side						
AC/DC type	1,500 V AC (Standard)	400 V	120 mA	AQV414E	AQV414EA	AQV414EAX	AQV414EAX	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs.
	5,000 V AC (Reinforced)	60 V	550 mA	AQV412EH	AQV412EHA	AQV412EHAX	AQV412EHAZ		
		350 V	130 mA	AQV410EH	AQV410EHA	AQV410EHAX	AQV410EHAZ		
		400 V	120 mA	AQV414EH	AQV414EHA	AQV414EHAX	AQV414EHAZ		

*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.

GU-E PhotoMOS (AQV414E, AQV410EH)

RATING

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

Item		Symbol	Type of connection	AQV414E(A)	AQV412EH(A)	AQV410EH(A)	AQV414EH(A)	Remarks	
Input	LED forward current	I _F		50 mA				f = 100 Hz, Duty factor = 0.1%	
	LED reverse voltage	V _R		5 V					
	Peak forwrd current	I _{FP}		1 A					
	Power dissipation	P _{in}		75 mW					
Output	Load voltage (peak AC)	V _L		400 V	60 V	350 V	400 V	A connection: Peak AC, DC B,C connection: DC	
	Continuous load current	I _L		A	0.12 A	0.55 A	0.13 A		0.12 A
				B	0.13 A	0.65 A	0.15 A		0.13 A
				C	0.15 A	0.8 A	0.17 A		0.15 A
	Peak load current	I _{peak}			0.3 A	1.5 A	0.4 A	0.3 A	A connection: 100 ms (1 shot), V _L = DC
	Power dissipation	P _{out}			500 mW				
Total power dissipation		P _T		550 mW					
I/O isolation voltage		V _{iso}		1,500 V AC	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 _{sta}		−40°C to +100°C −40°F to +212°F					

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

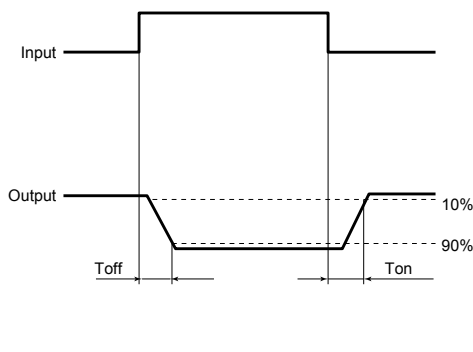
Item				Symbol	Type of connection	AQV414E(A)	AQV412EH(A)	AQV410EH(A)	AQV414EH(A)	Condition
Input	LED operate (OFF) current		Typical	I _{Foff}	—	1.45 mA	1.9 mA	1.9 mA	1.9 mA	I _L = Max.
			Maximum			3.0 mA				
	LED reverse (ON) current		Minimum	I _{Fon}	—	0.3 mA	0.4 mA	0.4 mA	0.4 mA	I _L = Max.
			Typical			1.40 mA	1.8 mA	1.8 mA	1.8 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}	A	26 Ω	1 Ω	18 Ω	25.2 Ω	I _F = 0 mA I _L = Max. Within 1 s on time
			Maximum			50 Ω	2.5 Ω	35 Ω	50 Ω	
			Typical	R _{on}	B	20 Ω	0.55 Ω	13 Ω	19 Ω	I _F = 0 mA I _L = Max. Within 1 s on time
			Maximum			25 Ω	1.3 Ω	17.5 Ω	25 Ω	
			Typical	R _{on}	C	10 Ω	0.3 Ω	6.5 Ω	10 Ω	I _F = 0 mA I _L = Max. Within 1 s on time
			Maximum			12.5 Ω	0.7 Ω	8.8 Ω	12.5 Ω	
	Off state leakage current		Maximum	I _{Leak}	—	1 μA	10 μA	10 μA	10 μA	I _F = 5 mA V _L = Max.
	Transfer characteristics	Switching speed	Operate (OFF) time*	Typical	T _{off}	—	0.7 ms	3 ms	1.5 ms	1.3 ms
Maximum				2.0 ms			10 ms	3.0 ms	3.0 ms	
Reverse (ON) time*			Typical	T _{on}	—	0.1 ms	0.3 ms	0.3 ms	0.3 ms	I _F = 5 mA → 0 mA I _L = Max.
			Maximum			1.0 ms	1.5 ms	1.5 ms	1.5 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 MΩ				500 V DC	

Note: Recommendable LED forward current

Standard type $I_F = 5 \text{ mA}$

Reinforced type $I_F = 5 \text{ to } 10 \text{ mA}$

*Operate/Reverse time

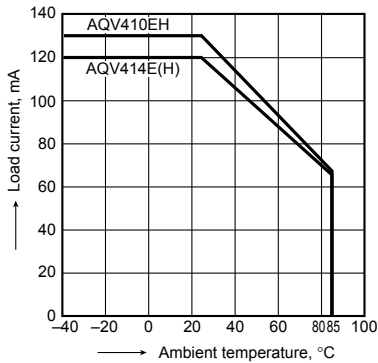


REFERENCE DATA

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

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

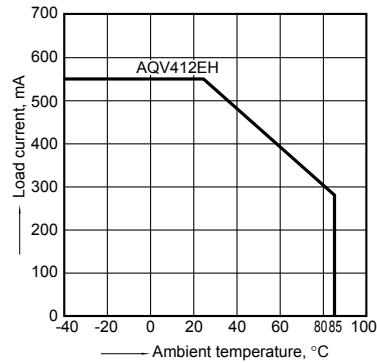
Type of connection: A



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

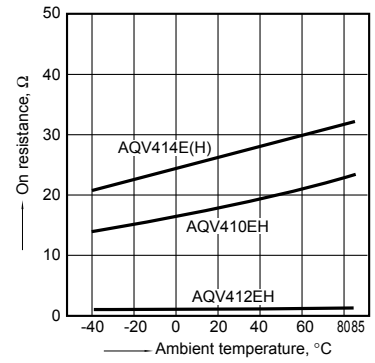
Allowable ambient temperature: -40°C to $+85^{\circ}\text{C}$
 -40°F to $+185^{\circ}\text{F}$

Type of connection: A



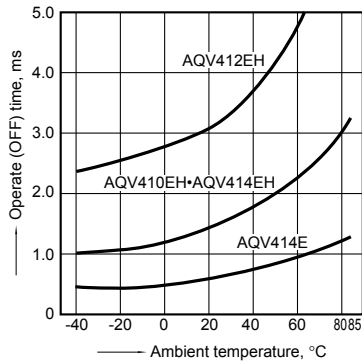
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
 LED current: 0 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



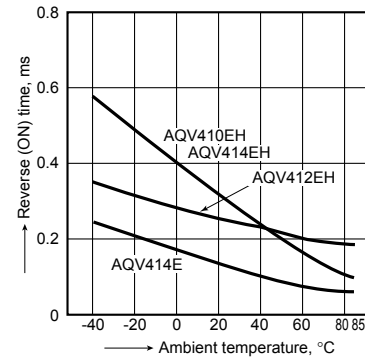
3. Operate (OFF) time vs. ambient temperature characteristics

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



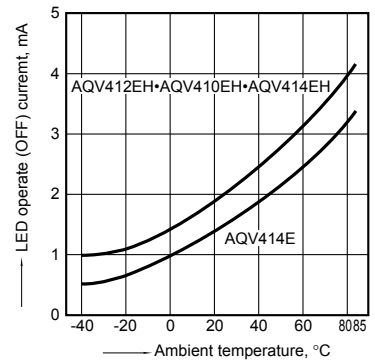
4. Reverse (ON) time vs. ambient temperature characteristics

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



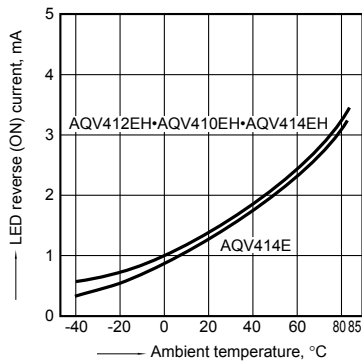
5. LED operate (OFF) current vs. ambient temperature characteristics

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



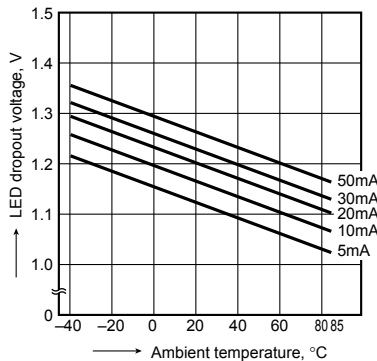
6. LED reverse (ON) current vs. ambient temperature characteristics

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



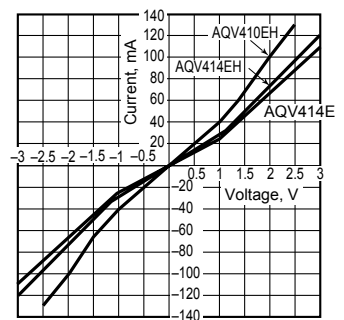
7. LED dropout voltage vs. ambient temperature characteristics

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



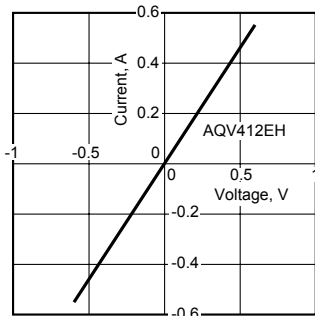
8-(1). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 4 and 6;
 Ambient temperature: 25°C 77°F

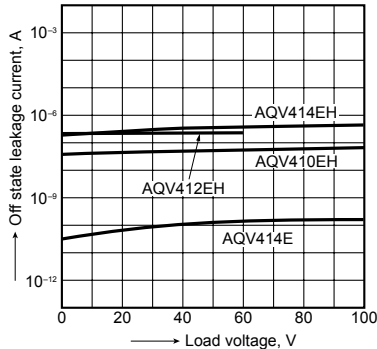


GU-E PhotoMOS (AQV414E, AQV410EH)

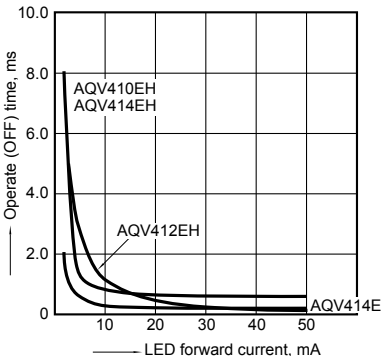
8-(2). Current vs. voltage characteristics of output at MOS portion
Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



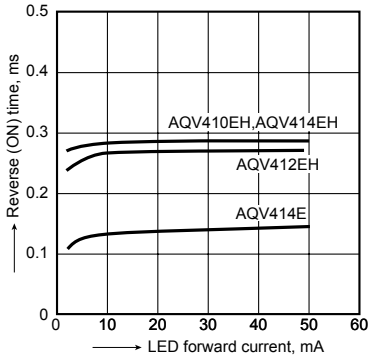
9. Off state leakage current vs. load voltage characteristics
Sample: All types;
Measured portion: between terminals 4 and 6;
LED current: 5 mA; Ambient temperature: 25°C 77°F



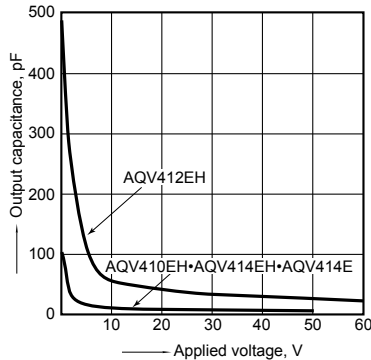
10. Operate (OFF) time vs. LED forward current characteristics
Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



11. Reverse (ON) time vs. LED forward current characteristics
Measured portion: between terminals 4 and 6;
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 4 and 6;
Frequency: 1 MHz;
Ambient temperature: 25°C 77°F



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Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

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