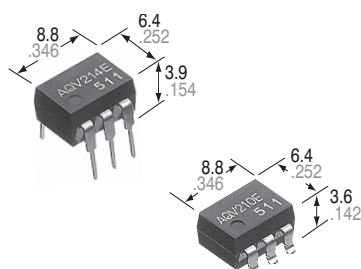


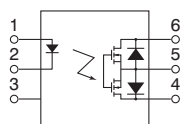
High cost-performance
DIP6-pin type, reinforced
insulation available

PhotoMOS[®]
GU-E 1 Form A
(AQV210E, AQV210EH)



CAD Data

mm inch



FEATURES

1. Reinforced insulation of I/O
isolation voltage 5,000V (Reinforced
insulation type)
2. Controls low-level analog signals
PhotoMOS relays feature extremely low
closed-circuit offset voltage to enable
control of low-level analog signals without
distortion.
3. Stable on-resistance
4. Low-level off state leakage current
of max. 1 μ A

TYPICAL APPLICATIONS

- High-speed inspection machines
- Telephone equipment
- Data communication equipment
- Computers

TYPES

	I/O isolation	Output rating*		Package	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
AC/DC dual use	Standard 1,500 V AC	350 V	130 mA	DIP6-pin	AQV210E	AQV210EA	AQV210EAX	AQV210EAX		
		400 V	120 mA		AQV214E	AQV214EA	AQV214EAX	AQV214EAX		
	Reinforced 5,000 V	350 V	130 mA		AQV210EH	AQV210EHA	AQV210EHAX	AQV210EHAZ		
		400 V	120 mA		AQV214EH	AQV214EHA	AQV214EHAX	AQV214EHAZ		

*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 relay.

RATING

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

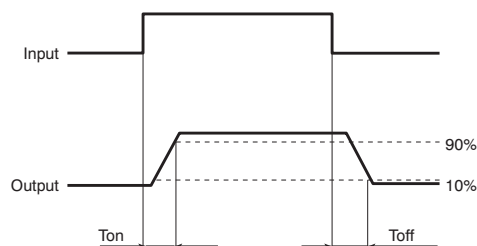
Item		Symbol	Type of connection	AQV210E(A)	AQV214E(A)	AQV210EH(A)	AQV214EH(A)	Remarks	
Input	LED forward current	I _F		50 mA					
	LED reverse voltage	V _R		5 V					
	Peak forward current	I _{FP}		1 A				f = 100 Hz, Duty factor = 0.1%	
	Power dissipation	P _{in}		75 mW					
Output	Load voltage (peak AC)	V _L		350 V	400 V	350 V	400 V		
	Continuous load current	I _L		A	0.13 A	0.12 A	0.13 A	0.12 A	A connection: Peak AC, DC B, C connection: DC
				B	0.15 A	0.13 A	0.15 A	0.13 A	
				C	0.17 A	0.15 A	0.17 A	0.15 A	
	Peak load current	I _{peak}			0.4 A	0.3 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 temp.	
	Storage	T _{stg}		-40°C to +100°C -40°F to +212°F					

GU-E 1 Form A (AQV210E, AQV210EH)

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

Item			Symbol	Type of connection	AQV210E(A)	AQV214E(A)	AQV210EH(A)	AQV214EH(A)	Condition
Input	LED operate current	Typical	I _{Fon}	—	1.1 mA		1.6 mA		I _L = Max.
		Maximum			3 mA				
	LED turn off current	Minimum	I _{Foff}	—	0.3 mA		0.4 mA		I _L = Max.
		Typical			1.0 mA		1.5 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	23 Ω	30 Ω	23 Ω	30 Ω	I _F = 5 mA
		Maximum			35 Ω	50 Ω	35 Ω	50 Ω	I _L = Max. Within 1 s on time
		Typical	R _{on}	B	11.5 Ω	22.5 Ω	11.5 Ω	22.5 Ω	I _F = 5 mA
		Maximum			17.5 Ω	25 Ω	17.5 Ω	25 Ω	I _L = Max. Within 1 s on time
		Typical	R _{on}	C	6.0 Ω	11.3 Ω	6.0 Ω	11.3 Ω	I _F = 5 mA
		Maximum			8.8 Ω	12.5 Ω	8.8 Ω	12.5 Ω	I _L = Max. Within 1 s on time
	Output capacitance	Typical	C _{out}	A	45 pF				I _F = 0 mA V _B = 0 V f = 1 MHz
	Off state leakage current	Maximum	I _{Leak}	—	1 μA				I _F = 0 mA V _L = Max.
Transfer characteristics	Turn on time*	Typical	T _{on}	—	0.5 ms		0.7 ms		I _F = 0 mA → 5 mA** I _L = Max.
		Maximum			2.0 ms				
	Turn off time*	Typical	T _{off}	—	0.05 ms				I _F = 0 mA → 5 mA I _L = Max.
		Maximum			1.0 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	

*Turn on/Turn off time



RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper relay operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	I_F	Standard type: 5 Reinforced type: 5 to 10	mA

■ Dimensions

■ Schematic and Wiring Diagrams

■ Cautions for Use

■ These products are not designed for automotive use.

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

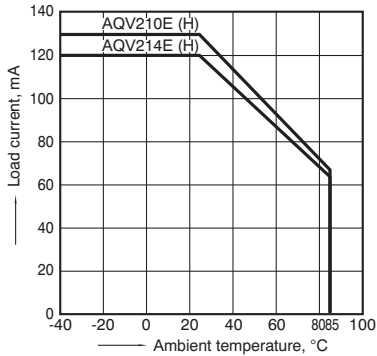
Please refer to our information on [PhotoMOS Relays for Automotive Applications](#).

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

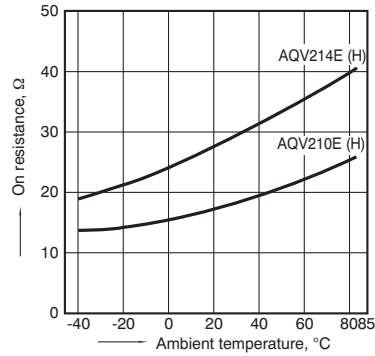
Allowable ambient temperature: -40°C to $+85^{\circ}\text{C}$
 -40°F to $+185^{\circ}\text{F}$

Type of connection: A



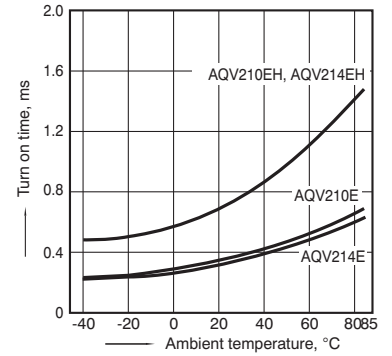
2. On-resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
 LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



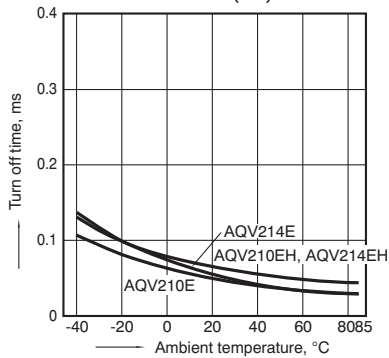
3. Turn on time vs. ambient temperature characteristics

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



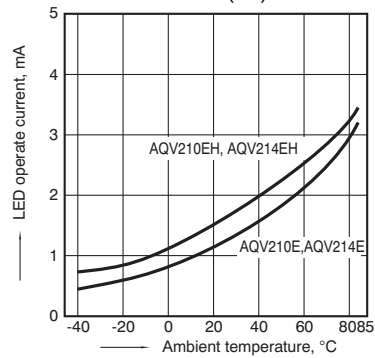
4. Turn off time vs. ambient temperature characteristics

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



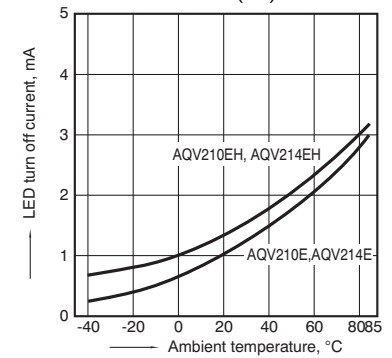
5. LED operate current vs. ambient temperature characteristics

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



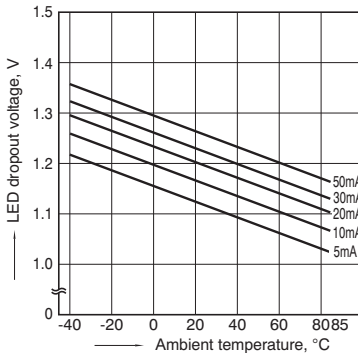
6. LED turn off current vs. ambient temperature characteristics

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



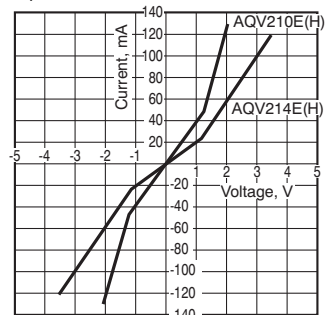
7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types
 LED current: 5 to 50 mA



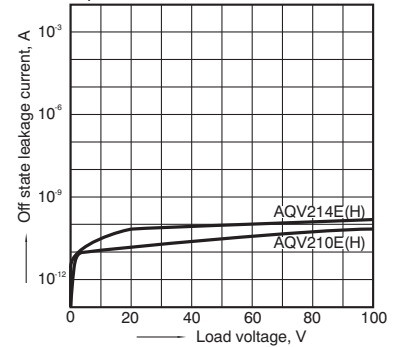
8. Current vs. voltage characteristics of output at MOS portion

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



9. Off state leakage current vs. load voltage characteristics

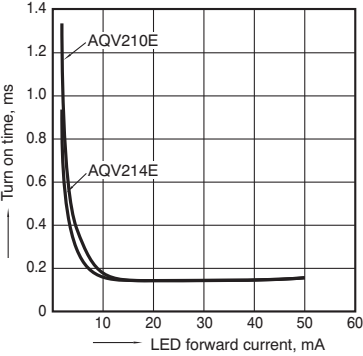
Measured portion: between terminals 4 and 6;
 Ambient temperature: 25°C 77°F



GU-E 1 Form A (AQV210E, AQV210EH)

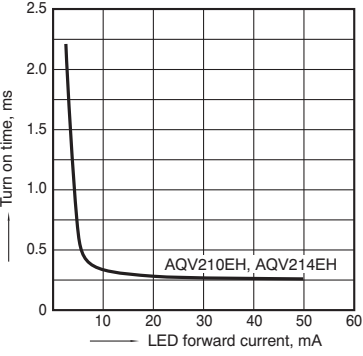
10-(1). Turn on time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC); Continuous load current:
Max. (DC); Ambient temperature: 25°C 77°F



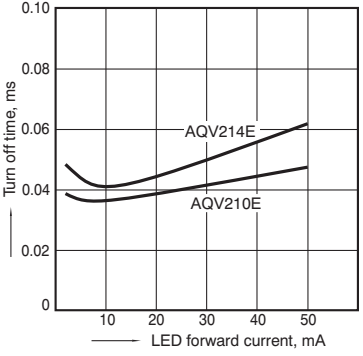
10-(2). Turn on time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC); Continuous load current:
Max. (DC); Ambient temperature: 25°C 77°F



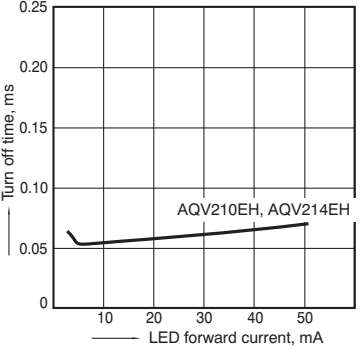
11-(1). Turn off time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC); Continuous load current:
Max. (DC); Ambient temperature: 25°C 77°F



11-(2). Turn 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



12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 4 and 6;
Frequency: 1 MHz;
Ambient temperature: 25°C 77°F

