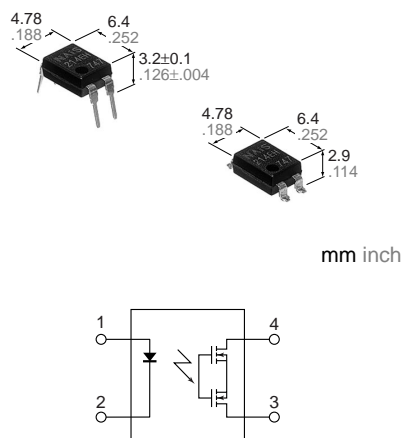


# NAIS

## GU (General Use)-E Type 1-Channel (Form A) 4-pin Type

# PhotoMOS RELAYS



### FEATURES

- 1. Reinforced insulation 5,000 V type**  
More than 0.4 mm internal insulation distance between inputs and outputs. Conforms to EN41003, EN60950 (reinforced insulation).
- 2. Compact 4-pin DIP size**  
The device comes in a compact (W)6.4×(L)4.78×(H)3.2mm (W).252×(L).188×(H).126inch, 4-pin DIP size.
- 3. Controls low-level analog signals**  
PhotoMOS relays feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.
- 4. High sensitivity, low ON resistance**  
Can control a maximum 0.13 A load current with a 5 mA input current. Low ON re-

sistance of 25Ω (AQY210EH). Stable operation because there are no metallic contact parts.

**5. Low-level off state leakage current**  
The SSR has an off state leakage current of several milliamperes, whereas the PhotoMOS relay has only 100 pA even with the rated load voltage of 350 V (AQY210EH).

### 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				
		Load voltage	Load current	Tube packing style	Tape and reel packing style		Tube	Tape and reel	
					Picked from the 1/2-pin side	Picked from the 3/4-pin side			
AC/DC type	Reinforced 5,000 V	350 V	130 mA	AQY210EH	AQY210EHA	AQY210EHAX	AQY210EHAZ	1 tube contains 100 pcs. 1 batch contains 1,000 pcs.	1,000 pcs.
		400 V	120 mA	AQY214EH	AQY214EHA	AQY214EHAX	AQY214EHAZ		

\*Indicate the peak AC and DC values.

Note: For space reasons, the initial letters of the product number "AQY", 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		Sym- bol	AQY210EH (A)	AQY214EH (A)	Remarks
Input	LED forward current	I <sub>F</sub>	50mA		
	LED reverse voltage	V <sub>R</sub>	3V		
	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>	350 V	400 V	
	Continuous load current	I <sub>L</sub>	0.13 A	0.12 A	
	Peak load current	I <sub>peak</sub>	0.4 A	0.3 A	100 ms (1 shot), V <sub>L</sub> = DC
	Power dissipation	P <sub>out</sub>	500mW		
Total power dissipation		P <sub>T</sub>	550mW		
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		

AQY210EH

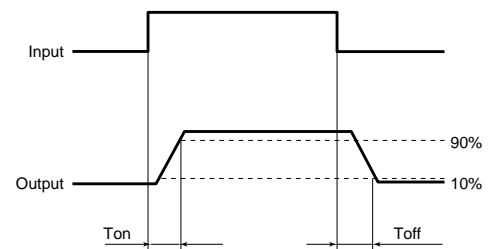
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	AQY210EH (A)	AQY214EH (A)	Condition
Input	LED operate current	Typical	I <sub>Fon</sub>	1.2mA		I <sub>L</sub> =Max.
		Maximum		3.0mA		
	LED turn off current	Minimum	I <sub>Foff</sub>	0.4mA		I <sub>L</sub> =Max.
		Typical		1.1mA		
	LED dropout voltage	Typical	V <sub>F</sub>	1.14 (1.25 V at I <sub>F</sub> =50mA)		I <sub>F</sub> =5mA
		Maximum		1.5V		
Output	On resistance	Typical	R <sub>On</sub>	18Ω	26Ω	I <sub>F</sub> =5mA I <sub>L</sub> =Max. Within 1 s on time
		Maximum		25Ω	35Ω	
	Off state leak-age current	Maximum	I <sub>Leak</sub>	1μA		I <sub>F</sub> =0 V <sub>L</sub> =Max.
Transfer char-acteristics	Turn on time*	Typical	T <sub>on</sub>	0.5ms		I <sub>F</sub> =5mA
		Maximum		2.0ms		I <sub>L</sub> =Max.
	Turn off time*	Typical	T <sub>off</sub>	0.08ms		I <sub>F</sub> =5mA
		Maximum		1.0ms		I <sub>L</sub> =Max.
	I/O capacitance	Typical	C <sub>Iso</sub>	0.8pF		f = 1MHz
		Maximum		1.5pF		V <sub>B</sub> =0
	Initial I/O isolation resistance	Minimum	R <sub>Iso</sub>	1,000MΩ		500V DC

Note: Recommendable LED forward current I<sub>F</sub>=5 to 10mA.

For type of connection, see page 31.

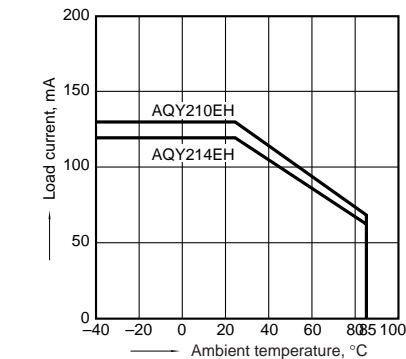
\*Turn on/Turn off time



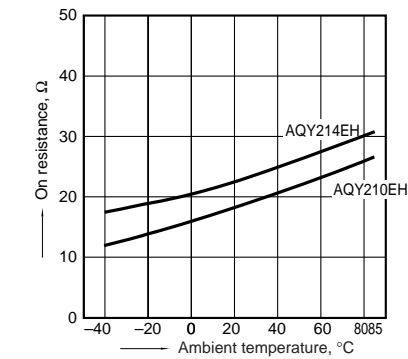
- For Dimensions, see Page 27.
- For Schematic and Wiring Diagrams, see Page 31.
- For Cautions for Use, see Page 36.

REFERENCE DATA

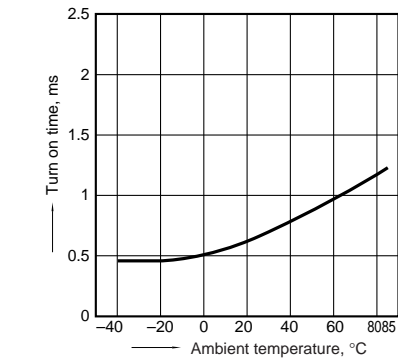
1. Load current vs. ambient temperature characteristics  
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F



2. On resistance vs. ambient temperature characteristics  
Measured portion: between terminals 3 and 4;  
LED current: 5 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)

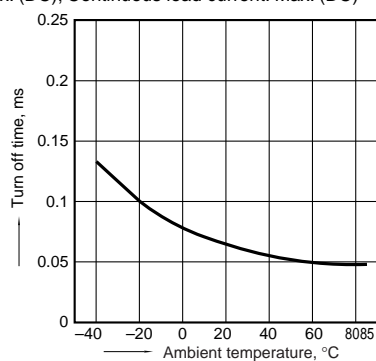


3. Turn on time vs. ambient temperature characteristics  
Sample: All types  
LED current: 5 mA; Load voltage: Max. (DC);  
Continuous load current: Max. (DC)



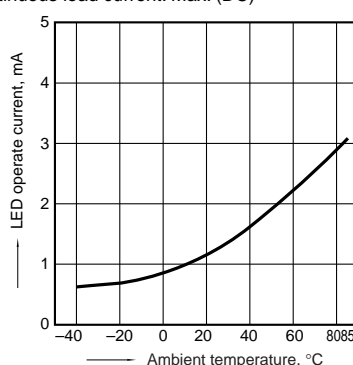
#### 4. Turn off time vs. ambient temperature characteristics

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



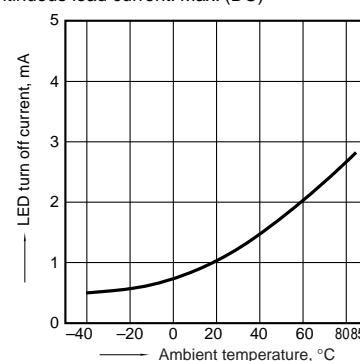
#### 5. LED operate current vs. ambient temperature characteristics

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



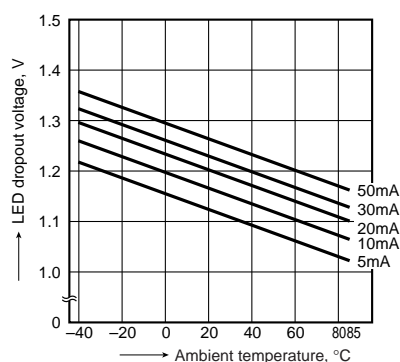
#### 6. LED turn off current vs. ambient temperature characteristics

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



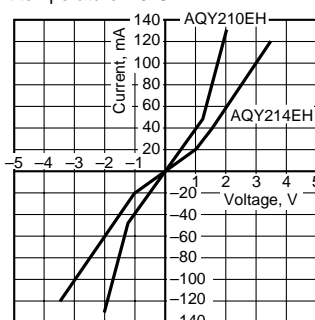
#### 7. LED dropout voltage vs. ambient temperature characteristics

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



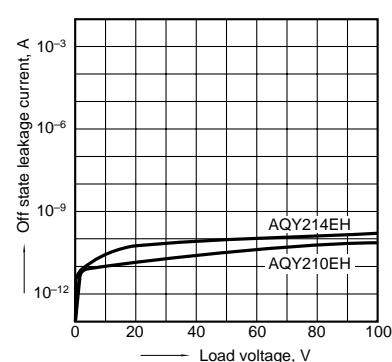
#### 8. Voltage vs. current characteristics of output at MOS portion

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



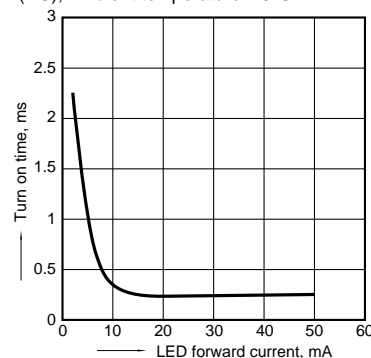
#### 9. Off state leakage current

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



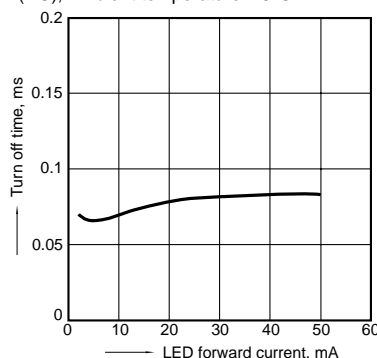
#### 10. LED forward current vs. turn on time characteristics

Sample: All types  
Measured portion: between terminals 3 and 4;  
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



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

Sample: All types  
Measured portion: between terminals 3 and 4;  
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



#### 12. Applied voltage vs. output capacitance characteristics

Sample: All types  
Measured portion: between terminals 3 and 4;  
Frequency: 1 MHz; Ambient temperature: 25°C 77°F

