

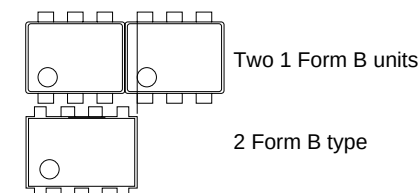
NAIS

GU (General Use) Type [2-Channel (Form B) Type]

PhotoMOS RELAYS

FEATURES

1. Approx. 1/2 the space compared with the mounting of Two 1 Form B photo MOS units



2. Applicable for 2 Form B use as well as two independent 1 Form B use

3. Low thermal electromotive force (Approx. 1 μ V)

4. Eliminates the need for a counter electromotive force protection diode in the drive circuits on the input side

5. Controls load currents up to 0.13 A with an input current of 5 mA

6. High speed switching: operate time typical of 300 μ s

7. Eliminates the need for a power supply to drive the power MOSFET

8. Extremely low closed-circuit offset voltages to enable control of small analog signals without distortion

9. Surface-mount model available

TYPICAL APPLICATIONS

- High-speed inspection machines
- Telephone equipment
- Computer

TYPES

Type	Output rating*		Part No.				Packing quantity	
	Load voltage	Load current	Through hole terminal	Surface-mount terminal				
			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	400 V	100 mA	AQW414	AQW414A	AQW414AX	AQW414AZ	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 package type indicator "X" and "Z" are omitted from the seal.

RATINGS

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

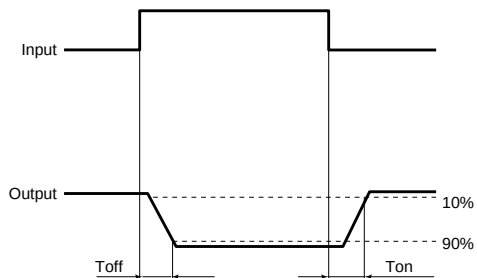
	Item	Symbol	AQW414(A)	Remarks
Input	LED forward current	I_F	50 mA	
	LED reverse voltage	V_R	3 V	
	Peak forward current	I_{FP}	1 A	$f = 100$ Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW	
Output	Load voltage	V_L	400 V	
	Continuous load current	I_L	0.1 A (0.13 A)	Peak AC, DC (): in case of using only 1 channel
	Peak load current	I_{peak}	0.3 A	100 ms (1 shot), $V_L = DC$
	Power dissipation	P_{out}	800 mW	
Total power dissipation		P_T	850 mW	
I/O isolation voltage		V_{iso}	1,500 V AC	
Temperature limits	Operating	T_{opr}	-40°C to +85°C -40°F to +185°F	Non-condensing at low temperatures
	Storage	T_{stag}	-40°C to +100°C -40°F to +212°F	

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

Item			Symbol	AQW414(A)	Condition
Input	LED operate (OFF) current	Typical	I_{Foff}	0.7 mA	$I_L = 100 \text{ mA}$
		Maximum		3 mA	
	LED reverse (ON) current	Minimum	I_{Fon}	0.4 mA	$I_L = 100 \text{ mA}$
		Typical		0.64 mA	
	LED dropout voltage	Typical	V_F	1.14 V (1.25 V at $I_F = 50 \text{ mA}$)	$I_F = 5 \text{ mA}$
		Maximum		1.5 V	
Output	On resistance	Typical	R_{on}	26 Ω	$I_F = 0 \text{ mA}$ $I_L = 100 \text{ mA}$ Within 1 s on time
		Maximum		50 Ω	
	Off state leakage current	Maximum	I_{Leak}	1 μA	$I_F = 5 \text{ mA}$ $V_L = 400 \text{ V}$
Transfer characteristics	Operate (OFF) time*	Typical	T_{off}	0.46 ms	$I_F = 0 \text{ mA} \rightarrow 5 \text{ mA}$ $I_L = 100 \text{ mA}$
		Maximum		1 ms	
	Reverse (ON) time*	Typical	T_{on}	0.40 ms	$I_F = 5 \text{ mA} \rightarrow 0 \text{ mA}$ $I_L = 100 \text{ mA}$
		Maximum		1 ms	
	I/O capacitance	Typical	C_{iso}	0.8 pF	$f = 1 \text{ MHz}$ $V_B = 0$
		Maximum		1.5 pF	
	Initial I/O isolation resistance	Minimum	R_{iso}	1,000 M Ω	500 V DC

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

*Operate/Reverse time



■ For Dimensions, see Page 440.

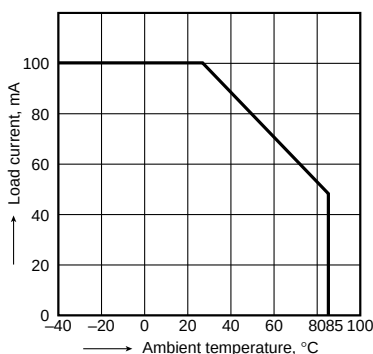
■ For Schematic and Wiring Diagrams, see Page 445.

■ For Cautions for Use, see Page 449.

REFERENCE DATA

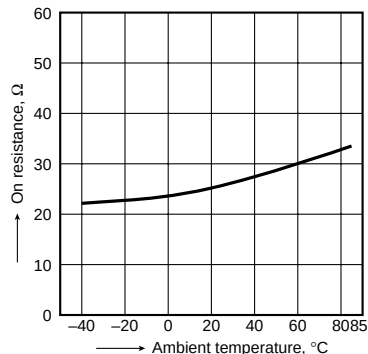
1. Load current vs. ambient temperature characteristics

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



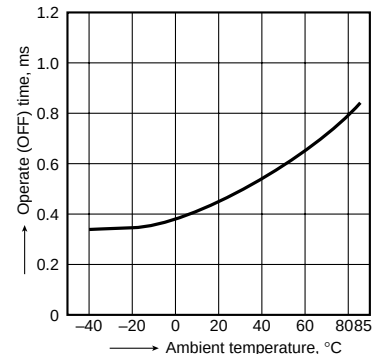
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
 LED current: 0 mA;
 Continuous load current: 100 mA (DC)



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

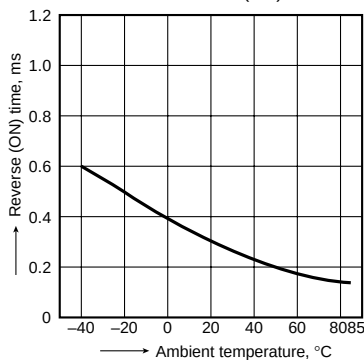
LED current: 5 mA;
 Load voltage: 400 V (DC);
 Continuous load current: 100 mA (DC)



AQW414

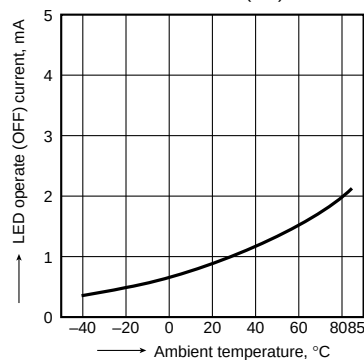
4. Reverse (ON) time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC)



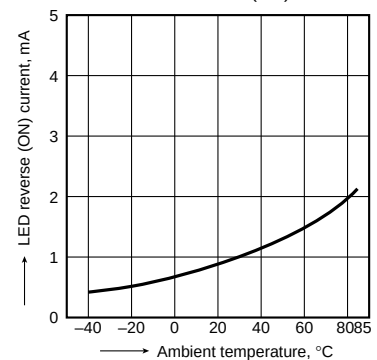
5. LED operate (OFF) current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC)



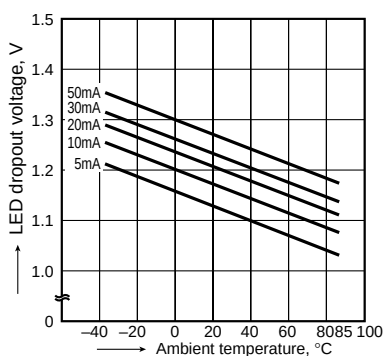
6. LED reverse (ON) current vs. ambient temperature characteristics

Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC)



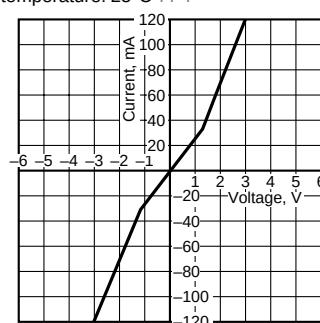
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



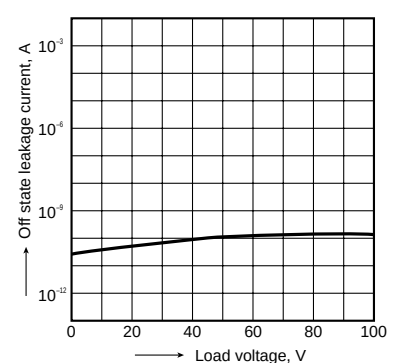
8. Voltage vs. current characteristics of output at MOS portion

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



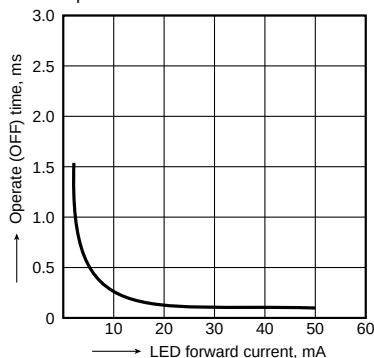
9. Off state leakage current

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



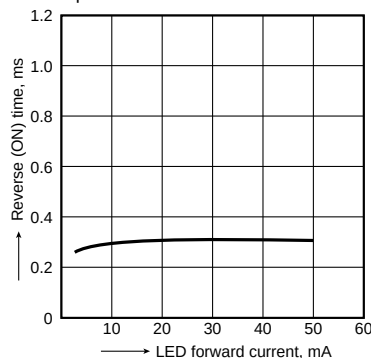
10. LED forward current vs. operate (OFF) time characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC);
Ambient temperature: 25°C 77°F



11. LED forward current vs. reverse (ON) time characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Load voltage: 400 V (DC);
Continuous load current: 100 mA (DC);
Ambient temperature: 25°C 77°F



12. Applied voltage vs. output capacitance characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Frequency: 1 MHz;
Ambient temperature: 25°C 77°F

