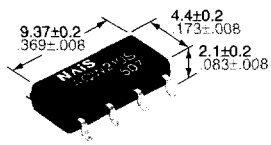
NAiS

GU (General Use) Type
SOP Series
2-Channel (Form A) Type

PhotoMOS RELAYS

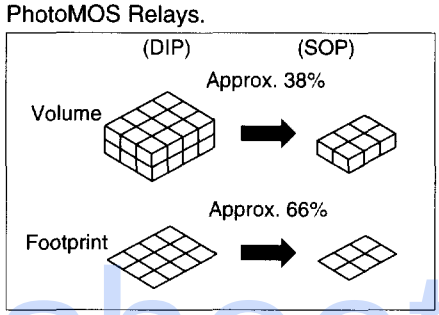
UL File No.: E43149
CSA File No.: LR26550



mm inch

FEATURES

1. 2 channels in super miniature design
The device comes in a super-miniature SO package measuring (W) 4.4×(L) 9.37×(H) 2.1 mm (W) .173×(L) .369×(H) .083 inch—approx. 38% of the volume and 66% of the footprint size of DIP type PhotoMOS Relays.



2. Tape and reel
The device comes standard in a tape and reel (1,000 pcs./reel) to facilitate automatic insertion machines.

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. Low-level off state leakage current
In contrast to the SSR with an off state leakage current of several milliamps, the PhotoMOS relay features a very small off state leakage current of only 100 pA even with the rated load voltage of 400 V (AQW214S).

TYPICAL APPLICATIONS

- Telephones
- Measuring instruments
- Computer
- Industrial robots
- High-speed inspection machines

TYPES

10

	Output rating*		Part No.		Packing quantity in tape and reel
	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	350 V	100 mA	AQW210SX	AQW210SZ	1,000 pcs.
	400 V	80 mA	AQW214SX	AQW214SZ	

* Indicate the peak AC and DC values.

Notes: (1) Tape package is the standard packing style. Also available in tube. (Part No. suffix "X" or "Z" is not needed when ordering; Tube: 50 pcs.; Case: 1,000 pcs.)
(2) For space reasons, the package type indicator "X" and "Z" are omitted from the seal.

RATING

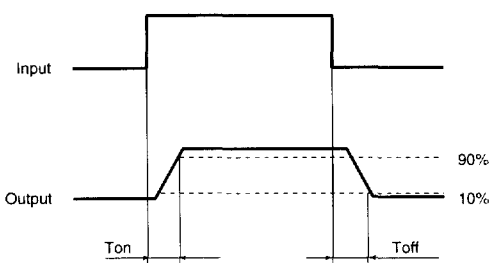
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item		Symbol	AQW210S	AQW214S	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 (peak AC)	V_L	350 V	400 V	
	Continuous load current	I_L	0.1 A (0.13 A)	0.08 A (0.1 A)	( ): in case of using only 1 channel
	Peak load current	I_{peak}	0.3 A	0.24 A	A connection: 100ms (1 shot), V_L = DC
	Power dissipation	P_{out}	600 mW		
Total power dissipation		P_T	650 mW		
I/O isolation voltage		V_{iso}	1,500 V AC		
Temperature limits	Operating	T_{opr}	−20°C to +80°C −4°F to +176°F		Non-condensing at low temperatures
	Storage	T_{stg}	−40°C to +100°C −40°F to +212°F		

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

Item			Symbol	AQW210S	AQW214S	Condition
Input	LED operate current	Minimum Typical Maximum	I_{Fon}	0.9 mA 3 mA		I_L = Max.
	LED turn off current	Minimum Typical Maximum	I_{Foff}	0.4 mA 0.8 mA		I_L = Max.
	LED dropout voltage	Minimum Typical Maximum	V_F	1.14 V (1.25 V at I_F = 50 mA) 1.5 V		I_F = 5 mA
Output	On resistance	Minimum Typical Maximum	R_{on}	16 Ω 35 Ω	30 Ω 50 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
	Off state leakage current	Minimum Typical Maximum	I_{Leak}	1 μA		I_F = 0 mA I_L = Max.
Transfer characteristics	Turn on time*	Minimum Typical Maximum	T_{on}	0.23 ms 0.5 ms	0.21 ms 0.5 ms	I_F = 5 mA I_L = Max.
	Turn off time*	Minimum Typical Maximum	T_{off}	0.04 ms 0.2 ms		I_F = 5 mA I_L = Max.
	I/O capacitance	Minimum Typical Maximum	C_{iso}	0.8 pF 1.5 pF		f = 1 MHz V_B = 0
	Initial I/O isolation resistance	Minimum Typical Maximum	R_{iso}	1,000 MΩ		500 V DC

*Turn on/Turn off time



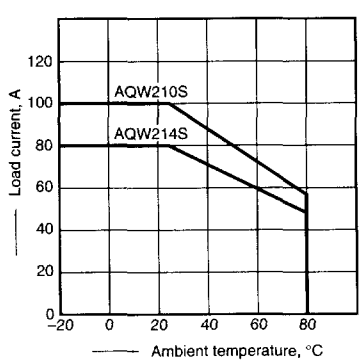
■ **For Dimensions, see Page 314.**
■ **For Schematic and Wiring Diagrams, see Page 317.**
■ **For Cautions for Use, see Page 321.**

10

REFERENCE DATA

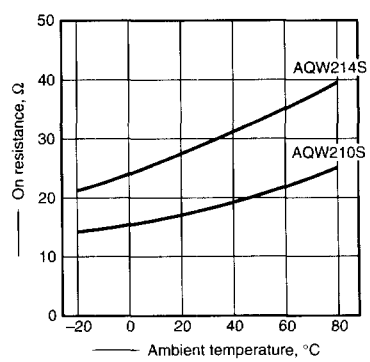
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: −20°C to +80°C
−4°F to +176°F



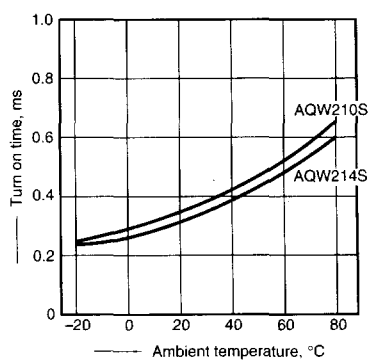
2. On resistance vs. ambient temperature characteristics

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

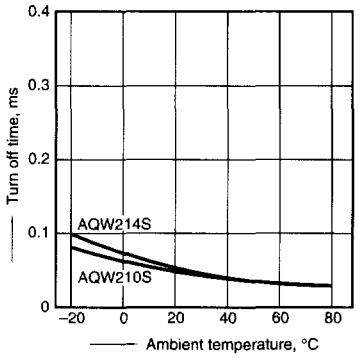


3. Turn on time vs. ambient temperature characteristics

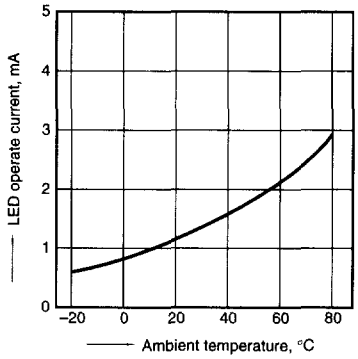
LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



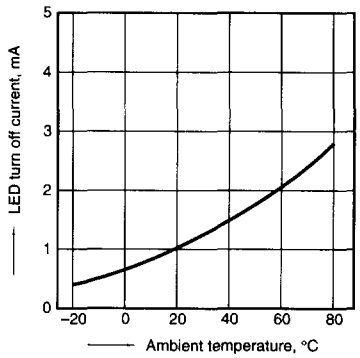
4. Turn off time vs. ambient temperature characteristics
LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



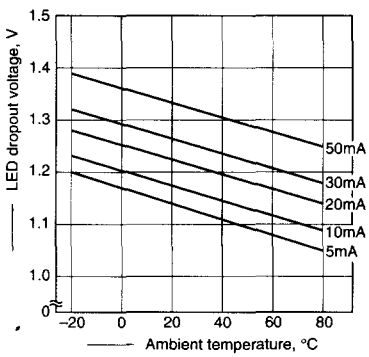
5. LED operate current vs. ambient temperature characteristics
Sample: All types; Load voltage: Max. (DC); Continuous load current: Max. (DC)



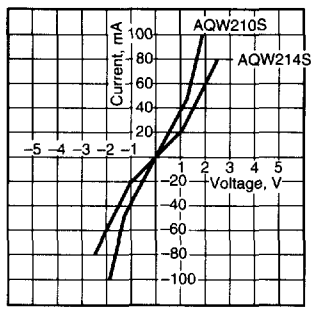
6. LED turn off current vs. ambient temperature characteristics
Sample: All types; Load voltage: Max. (DC); Continuous load current: Max. (DC)



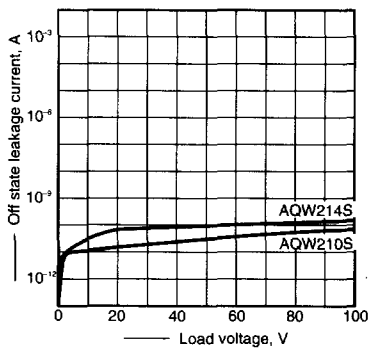
7. LED dropout voltage vs. ambient temperature characteristics
Sample: All types; LED current: 5 to 50 mA



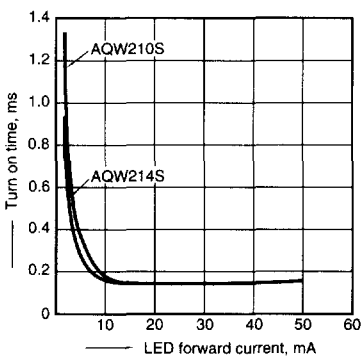
8. Voltage vs. current characteristics of output at MOS portion
Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



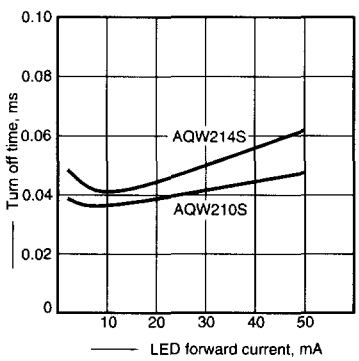
9. Off state leakage current
Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



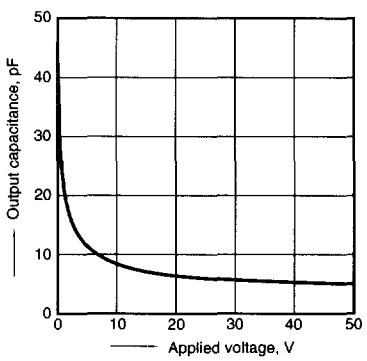
10. LED forward current vs. turn on time characteristics
Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



11. LED forward current vs. turn off time 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. 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



10