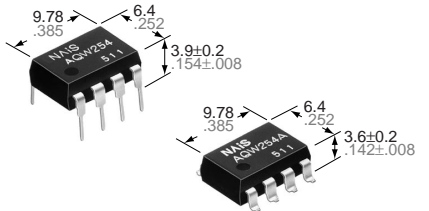


NAIS

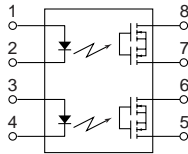
HE (High-function Economy) Type [2-Channel (Form A) Type]

PhotoMOS RELAYS

FEATURES



mm inch



1. Compact 8-pin DIP size

The device comes in a compact (W) 6.4×(L) 9.78×(H) 3.9 mm (W) .252×(L) .385×(H) .154 inch, 8-pin DIP size (through hole terminal type).

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

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 0.16 A (AQW254) load current with a 5 mA input current. Low ON resistance of 16 Ω (AQW254). 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 400 V (AQW254).

6. Low thermal electromotive force (Approx. 1 μV)

TYPICAL APPLICATIONS

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

TYPES

Type	Output rating*		Part No.				Packing quantity	
			Through hole terminal	Surface-mount terminal			Tube	Tape and reel
	Load voltage	Load current	Tube packing style		Tape and reel packing style			
					Picked from the 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side		
AC/DC	400 V	120 mA	AQW254	AQW254A	AQW254AX	AQW254AZ	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.

RATING

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

	Item	Symbol	AQW254(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 (peak AC)	V_L	400 V	
	Continuous load current	I_L	0.12 A (0.16 A)	A connection: Peak AC, DC (): in case of using only 1 channel
	Peak load current	I_{peak}	0.36 A	A connection: 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	Between input and output/between contact sets
Temperature limits	Operating	T_{opr}	-40°C to +85°C -40°F to +185°F	Non-condensing at low temperatures
	Storage	T_{stg}	-40°C to +100°C -40°F to +212°F	

AQW254

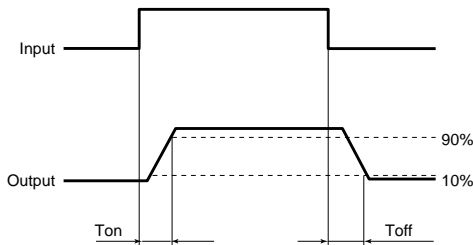
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	AQW254(A)	Condition
Input	LED operate current	Typical	I_{Fon}	0.9 mA	$I_L = \text{Max.}$
		Maximum		3 mA	
	LED turn off current	Minimum	I_{Foff}	0.4 mA	$I_L = \text{Max.}$
		Typical		0.8 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}	12.4 Ω	$I_F = 5 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time
		Maximum		16 Ω	
	Off state leakage current	Maximum	I_{Leak}	1 μA	$I_F = 0 \text{ mA}$ $V_L = \text{Max.}$
Transfer characteristics	Switching speed	Turn on time*	Typical	0.8 ms	$I_F = 5 \text{ mA}$
			Maximum	2 ms	$I_L = \text{Max.}$
		Turn off time*	Typical	0.05 ms	$I_F = 5 \text{ mA}$
			Maximum	0.2 ms	$I_L = \text{Max.}$
	I/O capacitance	Typical	C_{iso}	0.8 pF	$f = 1 \text{ MHz}$
		Maximum		1.5 pF	$V_B = 0$
Initial I/O isolation resistance	Minimum	R_{iso}	1,000 M Ω	500 V DC	

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

For type of connection, see page 32.

*Turn on/Turn off time

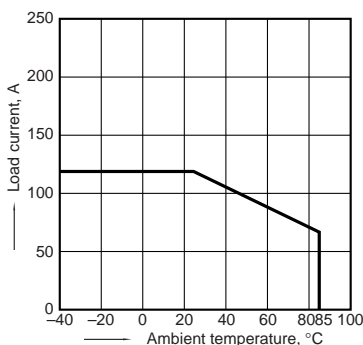


- For Dimensions, see Page 27.
- For Schematic and Wiring Diagrams, see Page 32.
- For Cautions for Use, see Page 36.

REFERENCE DATA

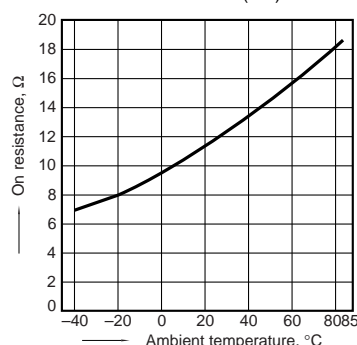
1. Load current vs. ambient temperature characteristics

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



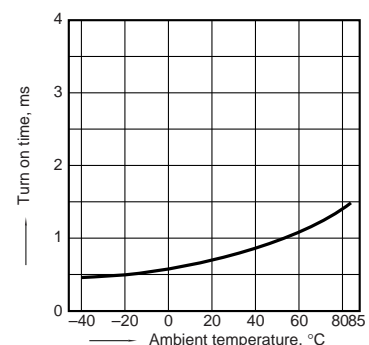
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8; LED current: 5 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



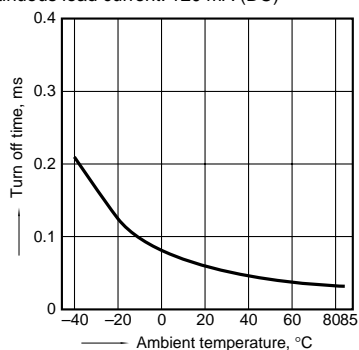
3. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



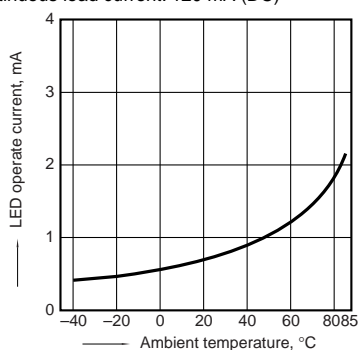
4. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



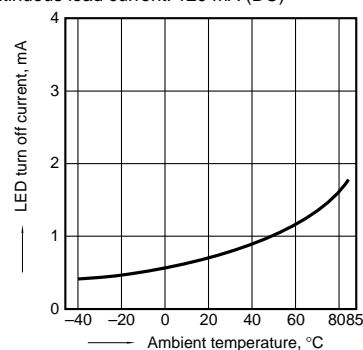
5. LED operate current vs. ambient temperature characteristics

Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



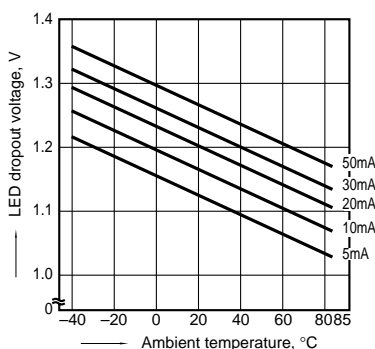
6. LED turn off current vs. ambient temperature characteristics

Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



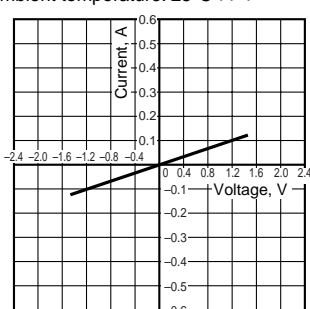
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



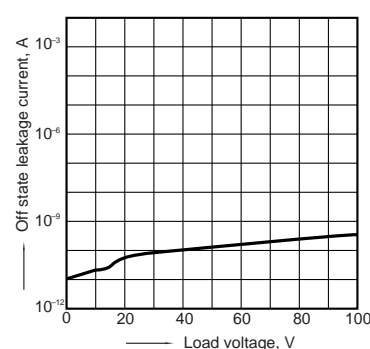
8. Voltage vs. current characteristics of output at MOS portion

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



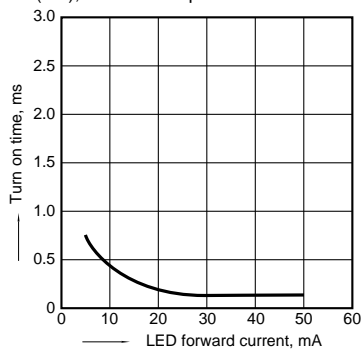
9. Off state leakage current

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



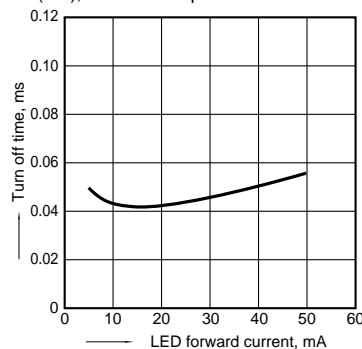
10. LED forward current vs. turn on time characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: 400 V (DC); Continuous load current: 120 mA (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: 400 V (DC); Continuous load current: 120 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

