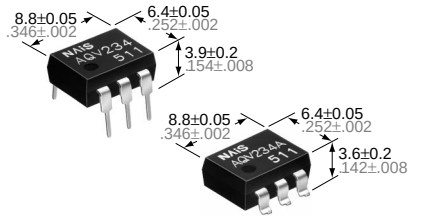
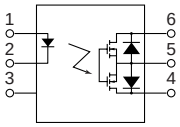
NAiS

HS (High Sensitivity) Type [1-Channel (Form A) Type]

PhotoMOS RELAYS



mm inch



FEATURES

1. High sensitivity type
LED operate current: typical 0.31 mA

2. Low-level off state leakage current (Typical 1 μA at 400 V load voltage)

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

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

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

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

7. Stable on resistance to help simplify circuit design

8. Surface-mount model available

TYPICAL APPLICATIONS

1. High-speed inspection machines
- Scanner
- IC checker
- Board tester

2. Telephone and data communication equipment

TYPES

Type	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 1/2/3-pin side	Picked from the 4/5/6-pin side		
AC/DC type	400 V	120 mA	AQV234	AQV234A	AQV234AX	AQV234AZ	1 tube contains 50 pcs. 1 batch contains 500 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	Type of connection	AQV234(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	A	0.12 A	A connection: Peak AC, DC B, C connection: DC
			B	0.13 A	
			C	0.15 A	
	Peak load current	I_{peak}		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	
Temperature limits	Operating	T_{opr}		–40°C to +85°C –40°F to +185°F	Non-condensing at low temperature
	Storage	T_{stg}		–40°C to +100°C –40°F to +212°F	

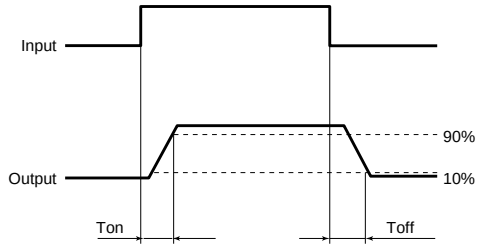
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item				Symbol	Type of connection	AQV234(A)	Remarks
Input	LED operate current		Typical	I_{Fon}	—	0.31 mA	$\Delta I_F/\Delta t \geqq$ Min. 100 μA/s I_L = 120 mA
			Maximum			0.5 mA	
	LED turn off current		Minimum	I_{Foff}	—	0.1 mA	$\Delta I_F/\Delta t \geqq$ Min. 100 μA/s I_L = 120 mA
			Typical			0.29 mA	
	LED dropout voltage		Typical	V_F	—	1.1 V (1.25 V at I_F = 50 mA)	I_F = 2 mA
			Maximum			1.5 V	
Output	On resistance		Typical	R_{on}	A	30 Ω	I_F = 2 mA I_L = 120 mA Within 1 s on time
			Maximum			50 Ω	
			Typical	R_{on}	B	22.5 Ω	I_F = 2 mA I_L = 120 mA Within 1 s on time
			Maximum			25 Ω	
			Typical	R_{on}	C	11.3 Ω	I_F = 2 mA I_L = 120 mA Within 1 s on time
			Maximum			12.5 Ω	
	Off state leakage current		Maximum	—	—	1 μA	I_F = 0 V_L = 400 V
Transistor characteristics	Switching speed	Turn on time*	Typical	T_{on}	—	0.89 ms	I_F = 2 mA I_L = 120 mA
			Maximum			2 ms	
		Turn off time*	Typical	T_{off}	—	0.22 ms	I_F = 2 mA I_L = 120 mA
			Maximum			1 ms	
	I/O capacitance		Typical	C_{iso}	—	0.8 pF	f = 1 MHz V_B = 0
			Maximum			1.5 pF	
	Initial I/O isolation resistance		Minimum	R_{iso}	—	1,000 MΩ	500 V DC

Note: Recommendable LED forward current I_F = 2mA.

For type of connection, see Page 31.

*Turn on/Turn off time



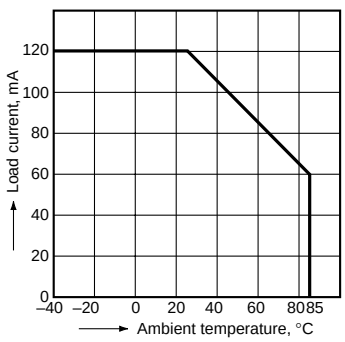
■ **For Dimensions, see Page 27.**
■ **For Schematic and Wiring Diagrams, see Page 31.**
■ **For Cautions for Use, see Page 36.**

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

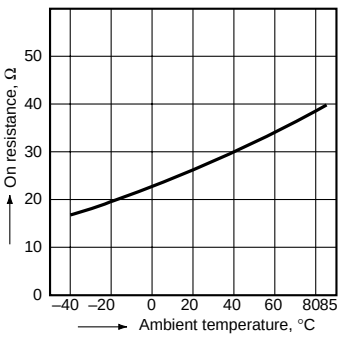
Allowable ambient temperature: –40°C to +85°C
–40°F to +185°F

Type of connection: A



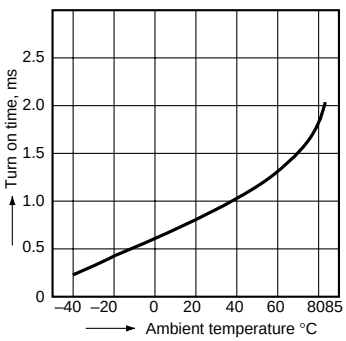
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 2 mA; Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



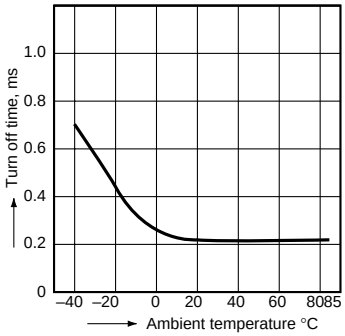
3. Turn on time vs. ambient temperature characteristics

LED current: 2 mA;
Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



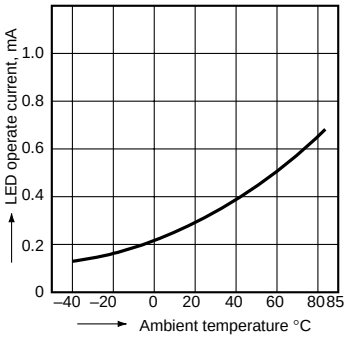
4. Turn off time vs. ambient temperature characteristics

LED current: 2 mA; Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



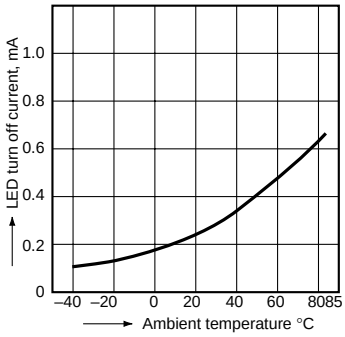
5. LED operate current vs. ambient temperature characteristics

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



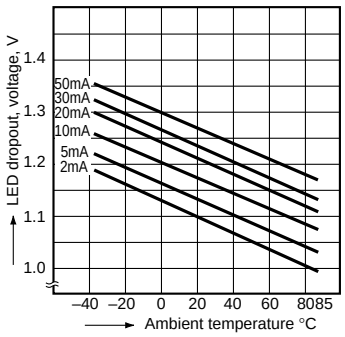
6. LED turn off current vs. ambient temperature characteristics

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



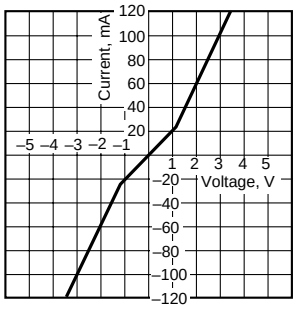
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 2 to 50 mA



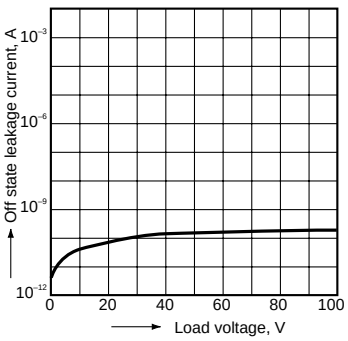
8. Voltage vs. current characteristics of output at MOS portion

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



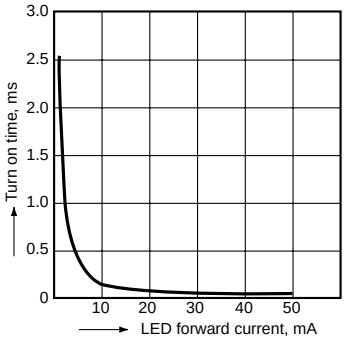
9. Off state leakage current

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



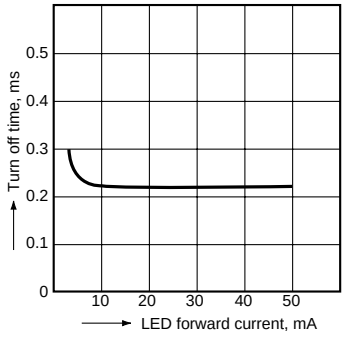
10. LED forward current vs. turn on time characteristics

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