

FEATURES

1. High frequency characteristics with low capacitance between output terminals

Low capacitance: Typ. 5 pF (between output terminals)
Isolation loss: 40 dB or more (at 1 MHz)

2. High sensitivity, high speed response

Controls load current of 0.12 A (max.), with input current of 5 mA.
Operate time is 100 μ s (Typical)

3. Low-level off state leakage current

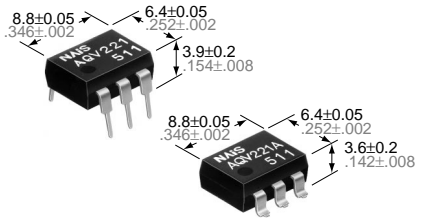
PhotoMOS AQV220 types exhibit an OFF state leakage current in the order of 100 picoamperes at a load voltage of 80 V compared with several milliamperes in solid-state relay.

4. Controls low-level analog signals

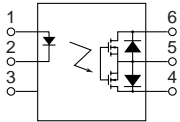
PhotoMOS relay features extremely low closed-circuit offset voltages to enable control of small analog signals without distortion.

5. Low terminal electromotive force (Approx. 1 mV)

6. Small LED voltage drop on input side (Max. 1.5 V)



mm inch



TYPICAL APPLICATIONS

- Measuring devices
Scanner, IC checker, Board tester
- Audio visual equipment
CD, VCR

TYPES

Type	Output rating*		Part No.				Packing quantity	
	Load voltage	Load current	Through hole terminal	Surface-mount terminal			Tube	Tape and reel
			Tube packing style		Tape and reel packing style			
				Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side			
AC/DC type	40 V	80 mA	AQV221	AQV221A	AQV221AX	AQV221AZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs
	80 V	50 mA	AQV225	AQV225A	AQV225AX	AQV225AZ		

*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	AQV221(A)	AQV225(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		40 V	80 V		
	Continuous load current	I_L		A	0.08 A	0.05 A	A connection: Peak AC, DC B, C connection: DC
				B	0.09 A	0.06 A	
				C	0.12 A	0.075 A	
	Peak load current	I_{peak}			0.18 A	0.15 A	A connection: 100 ms (1 shot), $V_L = DC$
Power dissipation	P_{out}		230 mW				
Total power dissipation		P_T		280 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_{stg}		-40°C to +100°C -40°F to +212°F			

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

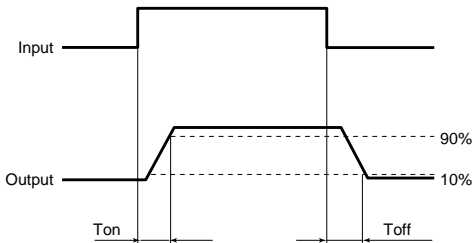
Item			Symbol	Type of connection	AQV221(A)	AQV225(A)	Remarks
Input	LED operate current	Typical	I _{Fon}	—	0.9 mA		I _L = Max.
		Maximum			3 mA		
	LED turn off current	Minimum	I _{Foff}	—	0.4 mA		I _L = Max.
		Typical			0.85 mA		
	LED dropout voltage	Typical	V _F	—	1.14 V**		I _F = 5 mA
		Maximum			1.5 V		
Output	On resistance	Typical	R _{on}	A	22 Ω	36 Ω	I _F = 5 mA I _L = Max. Within 1 s on time
		Maximum			35 Ω	50 Ω	
		Typical	R _{on}	B	13 Ω	21 Ω	
		Maximum			18 Ω	25 Ω	
	On resistance	Typical	R _{on}	C	6.5 Ω	10.5 Ω	I _F = 5 mA I _L = Max. Within 1 s on time
		Maximum			9 Ω	12.5 Ω	
	Output capacitance	Typical	C _{out}	—	5.6 pF	4.8 pF	I _F = 0 V _B = 0 f = 1 MHz
		Maximum			8 pF		
	Off state leakage current	Typical	I _{Leak}	—	30 pA		I _F = 0 V _L = Max.
		Maximum			10 nA		
Transfer characteristics	Switching speed	Turn on time*	T _{on}	—	0.10 ms		I _F = 5 mA I _L = Max.
					Maximum	0.3 ms	
		Turn off time*	T _{off}	—	0.03 ms		I _F = 5 mA I _L = Max.
					Maximum	0.1 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

Recommendable LED forward current I_F = 5mA.

For type of connection, see Page 31.

*Turn on/Turn off time

**1.25 V at I_F = 50 mA



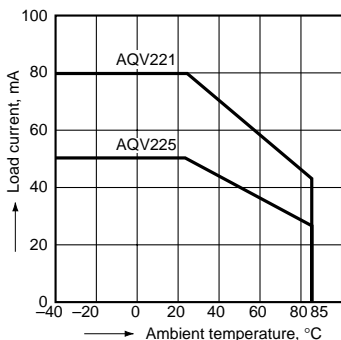
- For Dimensions, see Page 27.
- For Schematic and Wiring Diagrams, see Page 31.
- For Cautions for Use, see Page 36.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

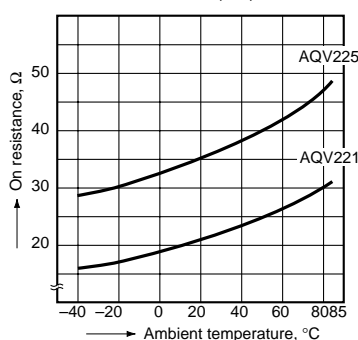
Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F

Type of connection: A



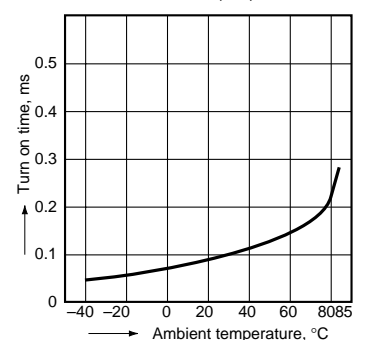
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



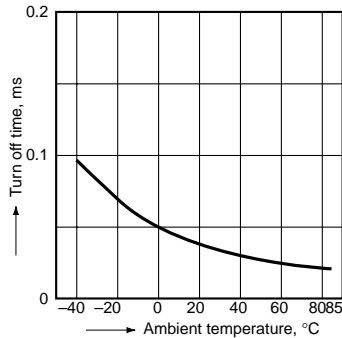
3. Turn on time vs. ambient temperature characteristics

Sample: AQV221, AQV225; LED current: 5 mA;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



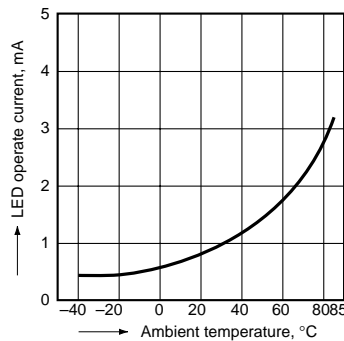
4. Turn off time vs. ambient temperature characteristics

Sample: AQV221, AQV225; LED current: 5 mA;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



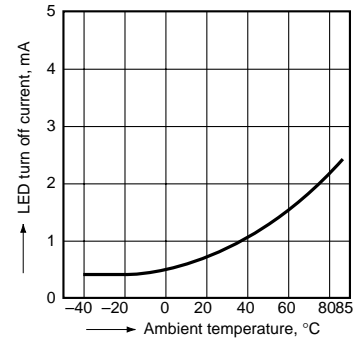
5. LED operate current vs. ambient temperature characteristics

Sample: AQV221, AQV225;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



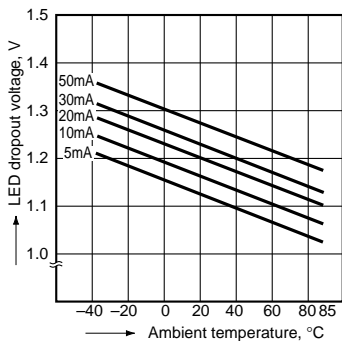
6. LED turn off current vs. ambient temperature characteristics

Sample: AQV221, AQV225;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



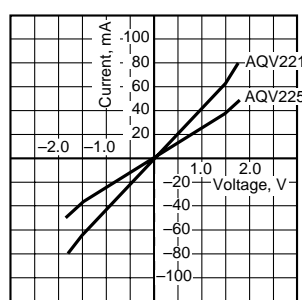
7. LED dropout voltage vs. ambient temperature characteristics

Sample: AQV221, AQV225;
LED current: 5 to 50 mA



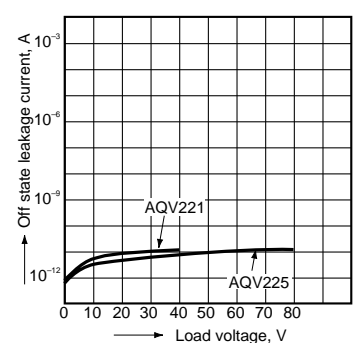
8. Voltage vs. current characteristics of output at MOS portion

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



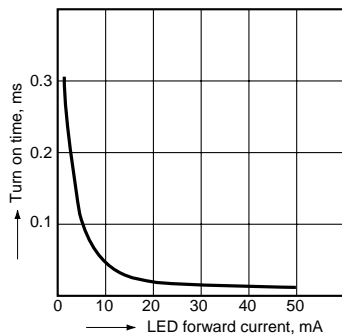
9. Off state leakage current

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



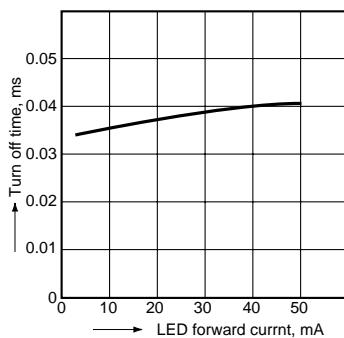
10. LED forward current vs. turn on time characteristics

Sample: AQV221, AQV225;
Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC);
Continuous load current: Max. (DC);
Ambient temperature: 25°C 77°F



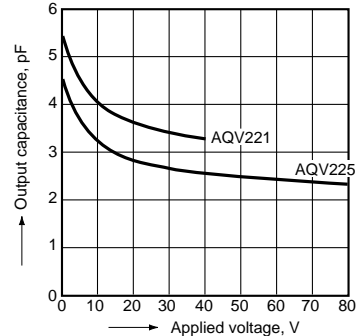
11. LED forward current vs. turn off time characteristics

Sample: AQV221, AQV225;
Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC);
Continuous load current: Max. (DC);
Ambient temperature: 25°C 77°F



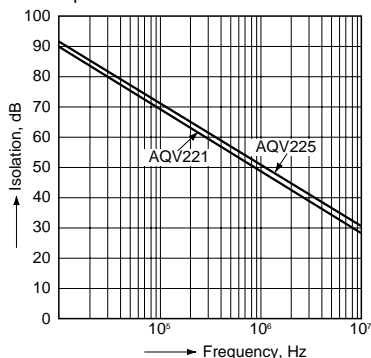
12. Applied voltage vs. output capacitance characteristics

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



13. Isolation characteristics (50Ω impedance)

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



14. Insertion loss characteristics (50Ω impedance)

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

