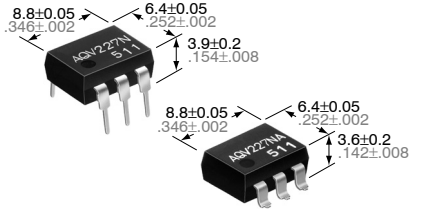
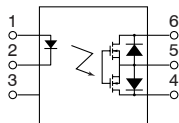


Lower output capacitance and on resistance. High speed switching. (Turn on time: 0.2ms, Turn off time: 0.08ms).

RF PhotoMOS (AQV220N)



mm inch



FEATURES

- 1. PhotoMOS relay with high response speed, low leakage current and low On resistance**
- 2. Low capacitance between output terminals ensures high response speed:**
The capacitance between output terminals is small, typically 10 pF. This enables for a fast operation speed of 200 μ s.
- 3. High sensitivity and low On resistance**
Maximum 0.1 A of load current can be controlled with input current of 5 mA. The On resistance is less than our conventional models. With no metallic contacts, the PhotoMOS relay has stable switching characteristics.

- 4. Low-level off state leakage current**
The SSR has an off state leakage current of several milliamperes, whereas the PhotoMOS relay has only 30 pA even with the rated load voltage of 200 V (AQV227N).
- 5. Controls low-level analog signals**
PhotoMOS relay features extremely low closed-circuit offset voltages to enable control of small analog signals without distortion.
- 6. Low terminals electromotive force (approx. 1 μ V)**

TYPICAL APPLICATIONS

- Measuring devices
- Scanner, IC checker, Board tester

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			
AC/DC type	200 V	70 mA	AQV227N	AQV227NA	AQV227NAX	AQV227NAZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs.
	400 V	50 mA	AQV224N	AQV224NA	AQV224NAX	AQV224NAZ		

*Indicate the peak AC and DC values.

Note: For space reasons, the package style indicator "X" or "Z" are not marked on the relay.

RATING

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

Item		Symbol	Type of connection	AQV227N(A)	AQV224N(A)	Remarks	
Input	LED forward current	I_F		50 mA			
	LED reverse voltage	V_R		5 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		200 V	400 V		
	Continuous load current	I_L		A	0.07 A	0.05 A	A connection: Peak AC, DC B, C connection: DC
				B	0.08 A	0.06 A	
				C	0.10 A	0.08 A	
	Peak load current	I_{peak}			0.21 A	0.15 A	A connection: 100 ms (1 shot), $V_L = DC$
Power dissipation	P_{out}		360 mW				
Total power dissipation		P_T		410 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			

RF PhotoMOS (AQV22○N)

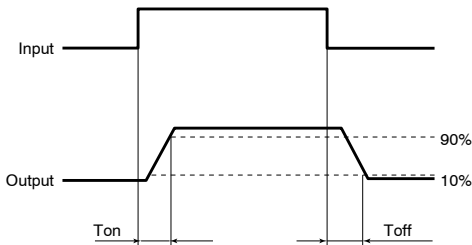
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item		Symbol	Type of connection	AQV227N(A)	AQV224N(A)	Remarks	
Input	LED operate current	Typical	I _{Fon}	0.90 mA		I _L = Max.	
		Maximum		3.0 mA			
	LED turn off current	Minimum	I _{Foff}	0.4 mA		I _L = Max.	
		Typical		0.85 mA			
LED dropout voltage	Typical	V _F	1.25 V (1.14 V at I _F = 5 mA)		I _F = 50 mA		
	Maximum		1.5 V				
Output	On resistance	Typical	R _{on}	A	30 Ω	70 Ω	I _F = 5 mA I _L = Max. Within 1 s on time
		Maximum		50 Ω	100 Ω		
		Typical	R _{on}	B	16 Ω	55 Ω	I _F = 5 mA I _L = Max. Within 1 s on time
		Maximum		25 Ω	70 Ω		
	Typical	R _{on}	C	8 Ω	28 Ω	I _F = 5 mA I _L = Max. Within 1 s on time	
	Maximum		12.5 Ω	35 Ω			
	Output capacitance	Typical	C _{out}	10 pF		I _F = 0 V _B = 0 f = 1 MHz	
		Maximum		15 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*	Typical	0.20 ms		I _F = 5 mA I _L = Max.	
			Maximum	0.5 ms			
		Turn off time*	Typical	0.08 ms		I _F = 5 mA I _L = Max.	
			Maximum	0.2 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 = 5mA.

[Type of connection](#)

*Turn on/Turn off time



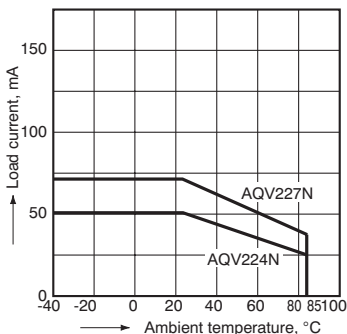
- [Dimensions](#)
- [Schematic and Wiring Diagrams](#)
- [Cautions for Use](#)

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

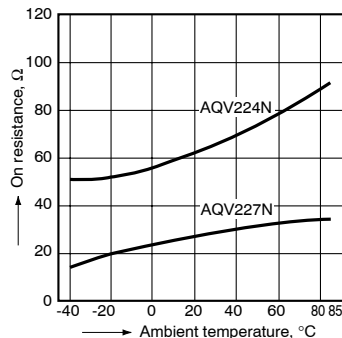
Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F

Type of connection: A



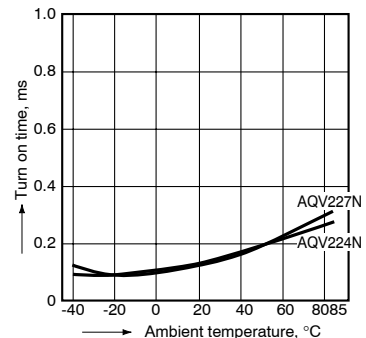
2. On resistance vs. ambient temperature characteristics

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



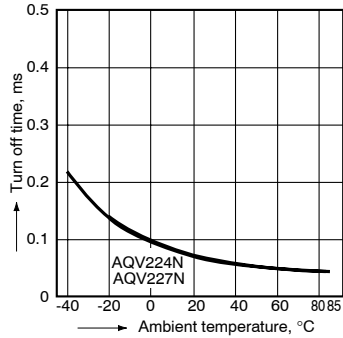
3. Turn on time vs. ambient temperature characteristics

Sample: AQV227N, AQV224N;
LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



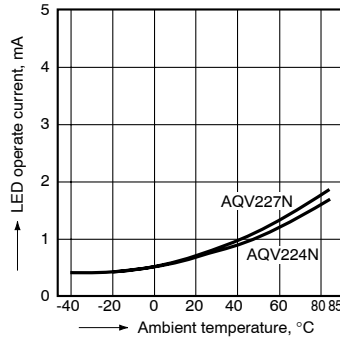
4. Turn off time vs. ambient temperature characteristics

Sample: AQV227N, AQV224N;
LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



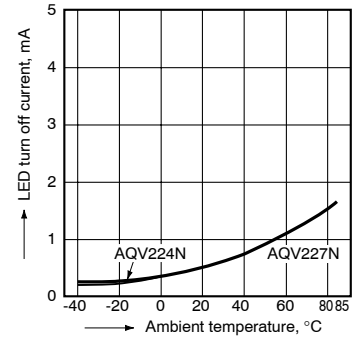
5. LED operate current vs. ambient temperature characteristics

Sample: AQV227N, AQV224N;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



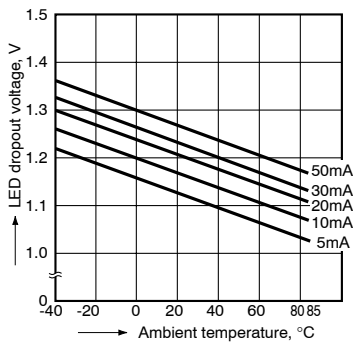
6. LED turn off current vs. ambient temperature characteristics

Sample: AQV227N, AQV224N;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



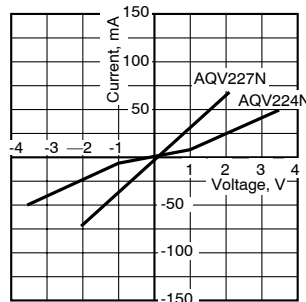
7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types;
LED current: 5 to 50 mA



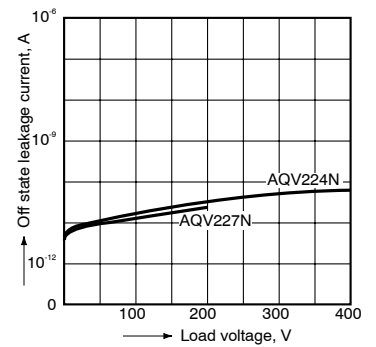
8. Current vs. voltage characteristics of output at MOS portion

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



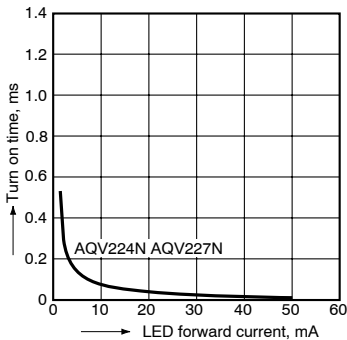
9. Off state leakage current

Sample: AQV227N, AQV224N;
Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



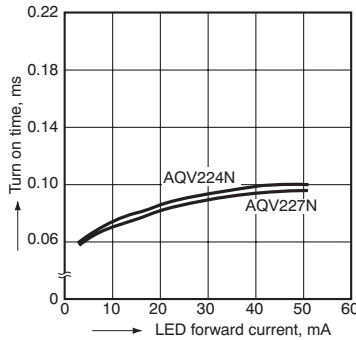
10. Turn on time vs. LED forward current characteristics

Sample: AQV227N, AQV224N;
Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC);
Continuous load current: Max. (DC);
Ambient temperature: 25°C 77°F



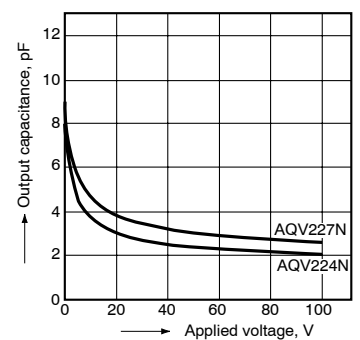
11. Turn off time vs. LED forward current characteristics

Sample: AQV227N, AQV224N;
Measured portion: between terminals 4 and 6;
Load voltage: Max. (DC);
Continuous load current: Max. (DC);
Ambient temperature: 25°C 77°F



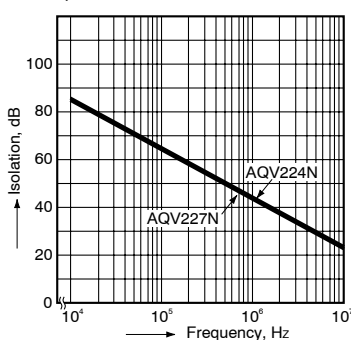
12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 4 and 6;
Frequency: 1 MHz, 30 mVrms;
Ambient temperature: 25°C 77°F



13. Isolation characteristics (50 Ω impedance)

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



14. Insertion loss characteristics (50 Ω impedance)

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

