

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

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.

RF PhotoMOS (AQV22ON)

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

Туре	Output rating*			Par				
			Through hole terminal	S	urface-mount termir	Packing quantity		
	Load voltage				Tape and reel packing style			Tape and reel
			Tube packing style		Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side	Tube	
AC/DC type	200 V	70 mA	AQV227N	AQV227NA	AQV227NAX	AQV227NAZ	1 tube contains 50 pcs.	1,000 pcs.
	400 V	50 mA	AQV224N	AQV224NA	AQV224NAX	AQV224NAZ	1 batch contains 500 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)

	Symbol	Type of connec- tion	AQV227N(A)	AQV224N(A)	Remarks		
	LED forward current	IF		50			
Input	LED reverse voltage	VR		5			
	Peak forward current	IFP	\neg	1	f = 100 Hz, Duty factor = 0.1%		
	Power dissipation	Pin		75 mW			
Output	Load voltage (peak AC)	VL		200 V	400 V		
	Continuous load current	IL.	Α	0.07 A	0.05 A		
			В	0.08 A	0.06 A	A connection: Peak AC, DC B, C connection: DC	
			С	0.10 A	0.08 A		
	Peak load current	I _{peak} Pout		0.21 A	0.15 A	A connection: 100 ms (1 shot), $V_L = DC$	
	Power dissipation			360 mW			
Total power dissipation		Рт		410 mW			
I/O isolation voltage		Viso		1,500 V AC			
Temperature limits	Operating	Topr		40°C to +85°C 40°F to +185°F		Non-condensing at low temperatures	
	Storage	Tstg		-40°C to +100°C -40°F to +212°F			

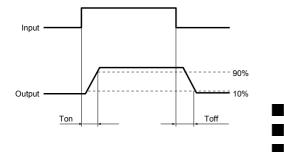
RF PhotoMOS (AQV22ON)

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

	Ite	m		Symbol	Type of connec- tion	AQV227N(A)	AQV224N(A)	Remarks
Input	LED operate current		Typical	IFon		0.90 mA		l∟ = Max.
			Maximum		_	3.0 mA		
	LED turn off current		Minimum	- IFoff		0.4 mA		— I∟ = Max.
			Typical			0.85 mA		
	LED dropout voltage		Typical	VF	_	1.25 V (1.14 V at I⊧ = 5 mA)		— I⊧ = 50 mA
			Maximum			1.5 V		
Output	On resistance		Typical	Ron	•	30 Ω	70 Ω	I _F = 5 mA I _L = Max. Within 1 s on time
			Maximum		A	50 Ω	100 Ω	
			Typical	- Ron	5	16 Ω	55 Ω	I⊧ = 5 mA I∟ = Max. Within 1 s on time
			Maximum		В	25 Ω	70 Ω	
			Typical		0	8 Ω	28 Ω	l⊧ = 5 mA
			Maximum	Ron	C –	12.5 Ω	35 Ω	── I∟ = Max. Within 1 s on time
			Typical			10 pF		IF = 0
	Output cap	acitance	Maximum	Cout		15 pF		$V_B = 0$ f = 1 MHz
	Off state leakage current		Typical	L .		30 pA	90 pA	IF = 0
			Maximum	Leak		10 nA		V∟ = Max.
Transfer characteristics	Switching speed	Turn on time*	Typical	Ton		0.20 ms		l⊧ = 5 mA l∟ = Max.
			Maximum			0.5 ms		
		Turn off time*	Typical	Toff	_	0.08 ms		l⊧ = 5 mA I∟ = Max.
			Maximum			0.2 ms		
	I/O capacitance		Typical	n Ciso		0.8 pF		f = 1 MHz V _B = 0
			Maximum			1.5 pF		
	Initial I/O is resistance	olation	Minimum	Riso	_	1,000 ΜΩ		500 V DC

Note: Recommendable LED forward current IF = 5mA.

*Turn on/Turn off time

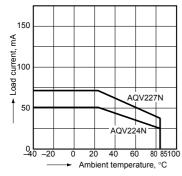


REFERENCE DATA

1. Load current vs. ambient temperature characteristics

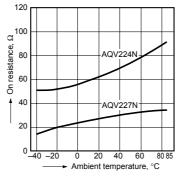
Allowable ambient temperature: –40°C to +85°C -40°F to +185°F





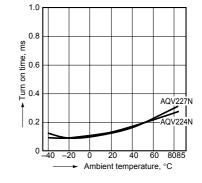
2. On resistance vs. ambient temperature characteristics

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

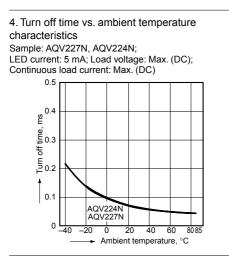


3. Turn on time vs. ambient temperature characteristics

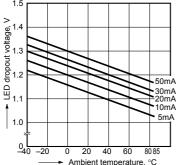
Sample: AQV227N, AQV224N; LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



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7. LED dropout voltage vs. ambient temperature characteristics Sample: All types; LED current: 5 to 50 mA 1.5



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);

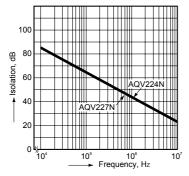
Ambient temperature: 25°C 77°F

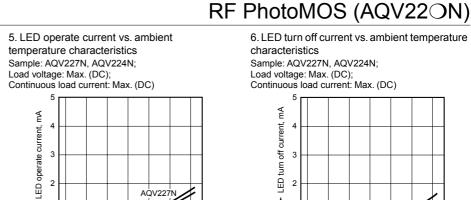


13. Isolation characteristics

(50 Ω impedance)

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

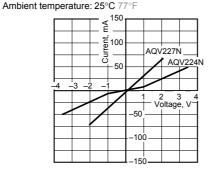




0 -20 20 40 60 80.85 40 0 Ambient temperature, °C 8. Current vs. voltage characteristics of output

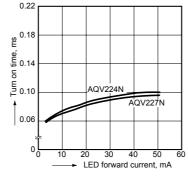
AQV224N

at MOS portion Measured portion: between terminals 4 and 6;

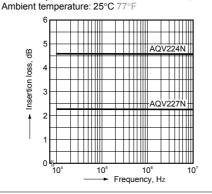


11. Turn off time vs. LED forward current characteristics

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

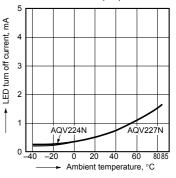


14. Insertion loss characteristics (50 Ω impedance) Measured portion: between terminals 4 and 6;

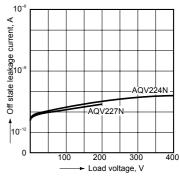


6. LED turn off current vs. ambient temperature characteristics Sample: AQV227N, AQV224N;

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

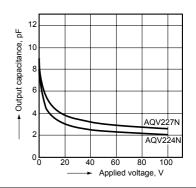


9. Off state leakage current Sample: AQV227N, AQV224N; Measured portion: between terminals 4 and 6; Ambient temperature: 25°C 77°F



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



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