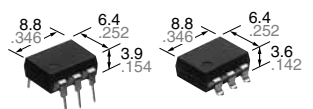


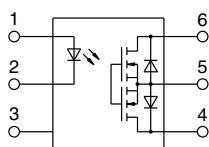
**DIP6-pin type featuring
low on-resistance
200V/400V load voltage**

**PhotoMOS®
RF 1 Form A**
Low on-resistance (AQV22○N)



(Height includes standoff)

mm inch



RoHS compliant

FEATURES

1. Low output capacitance and high response speed

The capacitance between output terminals is small; Typ. 10pF. This enables a fast operation speed of Typ. 0.2ms.

2. High sensitivity and low on-resistance

Max. 0.1 A of load current can be controlled with input current of 5 mA. The on resistance is less than our conventional models.

3. Low-level off state leakage current of Typ. 0.03nA (AQV227N)

4. Controls low-level analog signals

TYPICAL APPLICATIONS

- Measuring instruments
- Communication equipment
- Computers
- Robots

TYPES

	Output rating*		Package	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 dual use	200 V	70 mA	DIP6-pin	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: The surface mount terminal indicator "A" and the packing style indicator "X" or "Z" are not marked on the device.

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 Vrms		
Ambient temperature	Operating	T _{opr}		−40 to +85°C −40 to +185°F		(Non-icing at low temperatures)
	Storage	T _{stg}		−40 to +100°C −40 to +212°F		

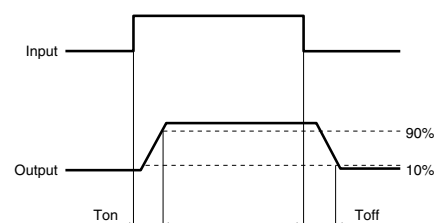
RF 1 Form A Low on-resistance (AQV22○N)

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

Item			Symbol	Type of connection	AQV227N(A)	AQV224N(A)	Condition
Input	LED operate current	Typical	I _{Fon}	—	0.9 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
		Maximum			50 Ω	100 Ω	
		Typical	R _{on}	B	16 Ω	55 Ω	I _F = 5 mA I _L = Max. Within 1 s
		Maximum			25 Ω	70 Ω	
		Typical	R _{on}	C	8 Ω	28 Ω	I _F = 5 mA I _L = Max. Within 1 s
		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}	—	0.03 nA	0.09 nA	I _F = 0 V _L = Max.
		Maximum			*10 nA		
Transfer characteristics	Turn on time**	Typical	T _{on}	—	0.2 ms		I _F = 5 mA I _L = Max.
		Maximum			0.5 ms		
	Turn off time**	Typical	T _{off}	—	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

*Available as custom orders (1 nA or less)

**Turn on/Turn off time



3. Recommended operating conditions (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

Item		Symbol	Min.	Max.	Unit
LED current		I_F	5	30	mA
AQV227N(A)	Load voltage (Peak AC)	V_L	—	160	V
	Continuous load current (A connection)	I_L	—	0.07	A
AQV224N(A)	Load voltage (Peak AC)	V_L	—	320	V
	Continuous load current (A connection)	I_L	—	0.05	A

■ These products are not designed for automotive use.

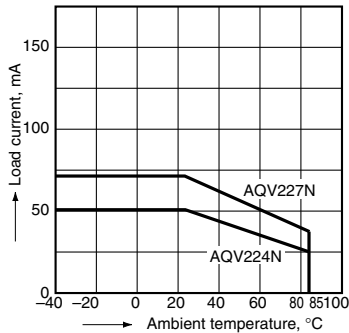
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

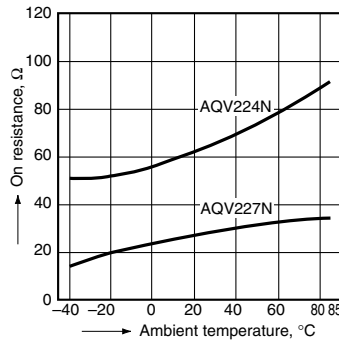
Allowable ambient temperature: -40 to $+85^{\circ}\text{C}$
 -40 to $+185^{\circ}\text{F}$

Type of connection: A



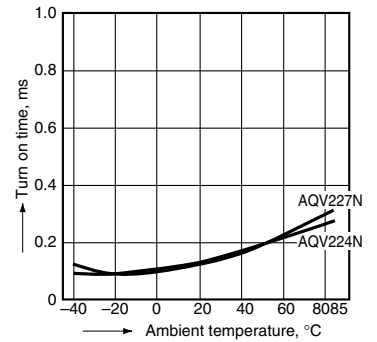
2. On resistance vs. ambient temperature characteristics

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



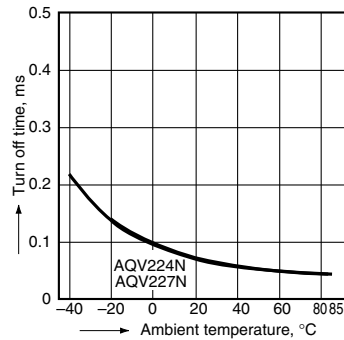
3. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



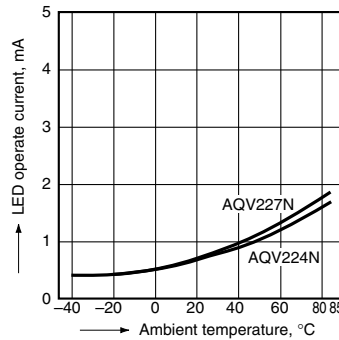
4. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



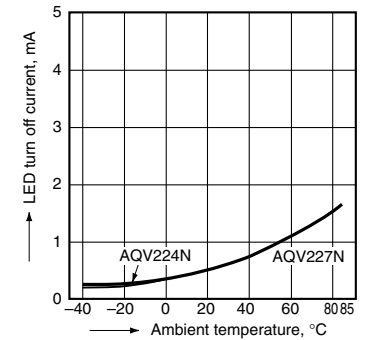
5. LED operate current vs. ambient temperature characteristics

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



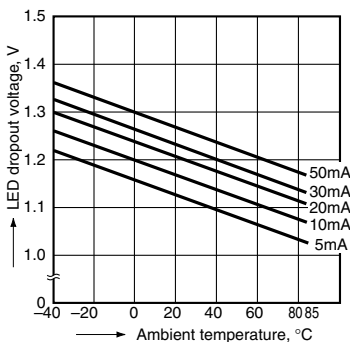
6. LED turn off current vs. ambient temperature characteristics

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



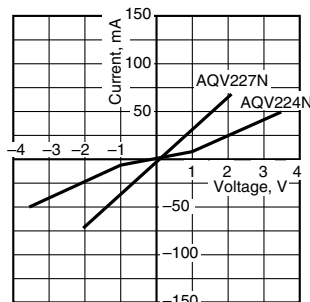
7. LED dropout voltage vs. ambient temperature characteristics

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



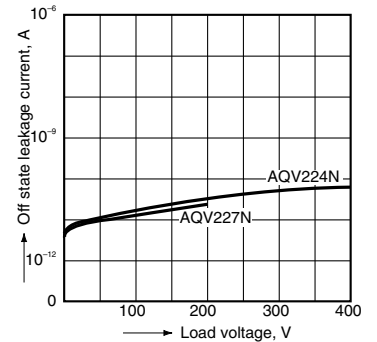
8. Current vs. voltage characteristics of output at MOS portion

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



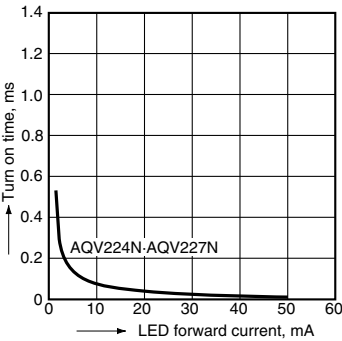
9. Off state leakage current vs. load voltage characteristics

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



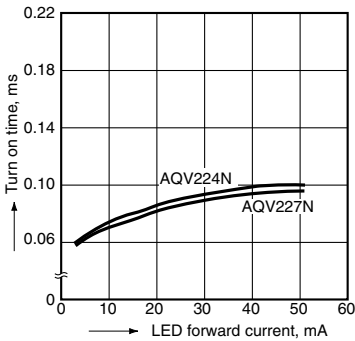
10. Turn on time vs. LED forward current characteristics

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



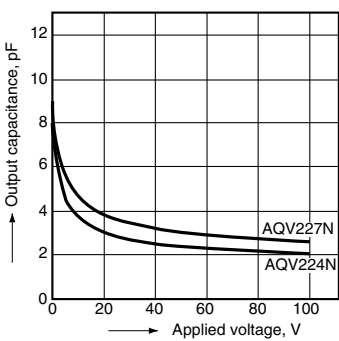
11. Turn off time vs. LED forward current characteristics

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



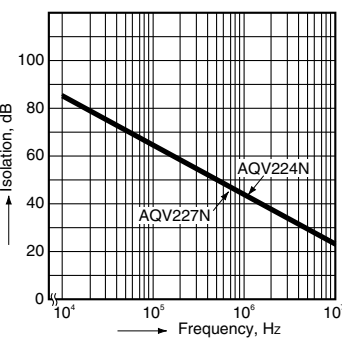
12. Output capacitance vs. applied voltage characteristics

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



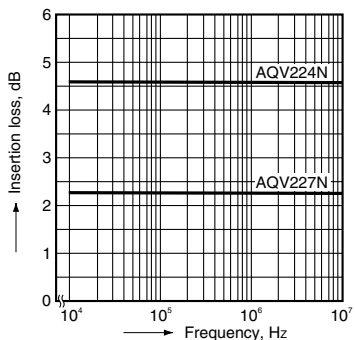
13. Isolation vs. frequency characteristics (50 Ω impedance)

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



14. Insertion loss vs. frequency characteristics (50 Ω impedance)

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



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