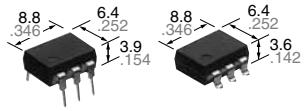
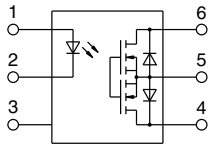
DIP6-pin type featuring low on-resistance 200V/400V load voltage

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 batch contains: 500 pcs.	1,000 pcs.
	400 V	50 mA		AQV224N	AQV224NA	AQV224NAX	AQV224NAZ		

*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)

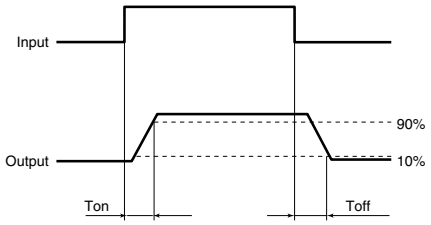
Item		Symbol	Type of connection	AQV227N(A)	AQV224N(A)	Remarks
Input	LED forward current	I_F		50 mA		
	LED reverse voltage	V_R		5 V		
	Peak forward current	I_{FP}		1 A		f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}		75 mW		
Output	Load voltage (peak AC)	V_L		200 V	400 V	
	Continuous load current	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		

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

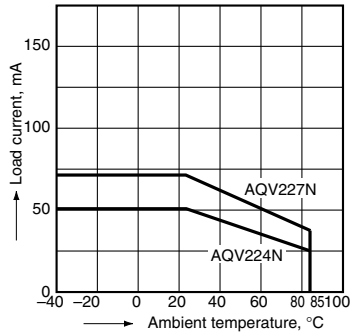
■ **These products are not designed for automotive use.**
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

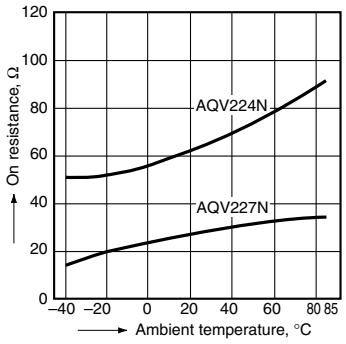
Allowable ambient temperature: –40 to +85°C
–40 to +185°F

Type of connection: A



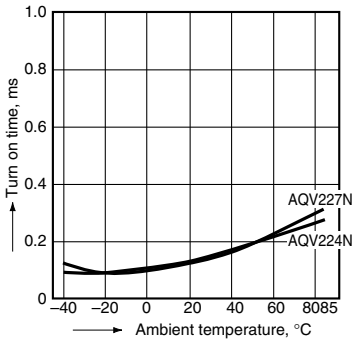
2. On resistance vs. ambient temperature characteristics

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



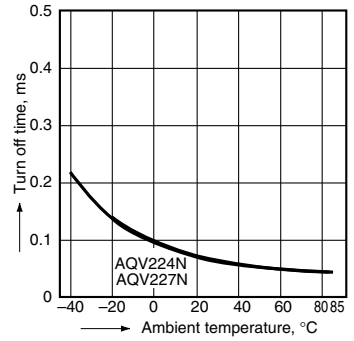
3. Turn on time vs. ambient temperature characteristics

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



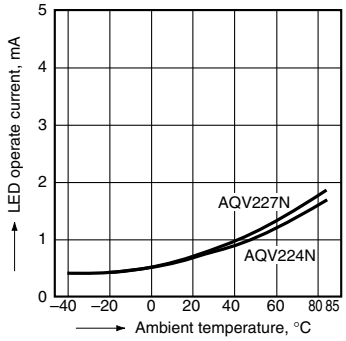
4. Turn off time vs. ambient temperature characteristics

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



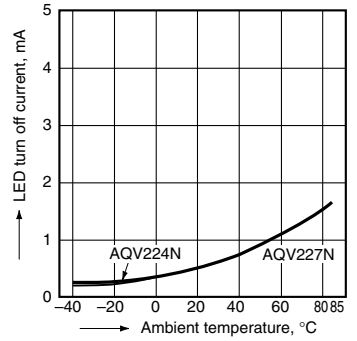
5. LED operate current vs. ambient temperature characteristics

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



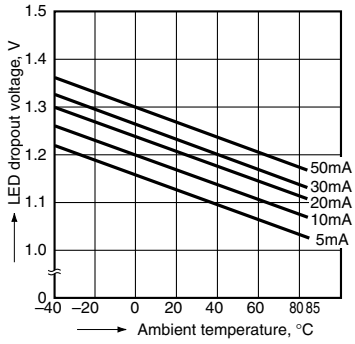
6. LED turn off current vs. ambient temperature characteristics

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



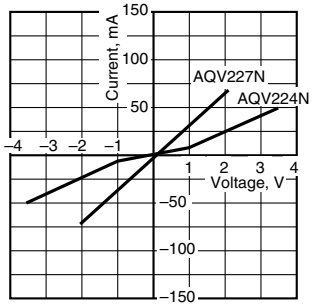
7. LED dropout voltage vs. ambient temperature characteristics

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



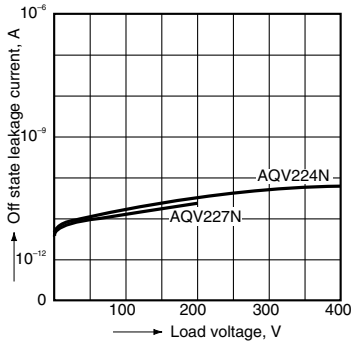
8. Current vs. voltage characteristics of output at MOS portion

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



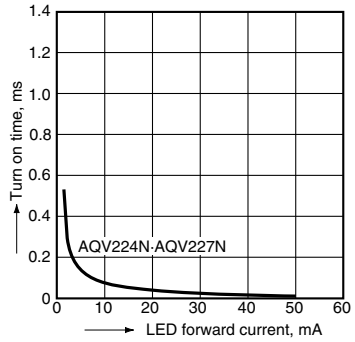
9. Off state leakage current vs. load voltage characteristics

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



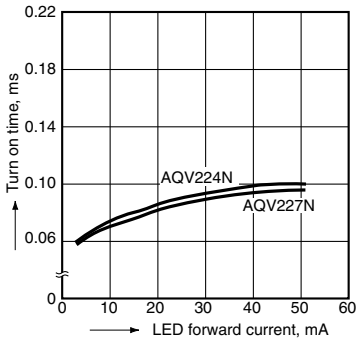
10. Turn on time vs. LED forward current characteristics

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



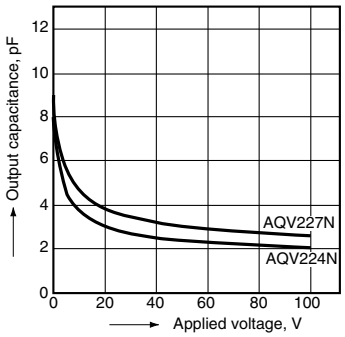
11. Turn off time vs. LED forward current characteristics

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



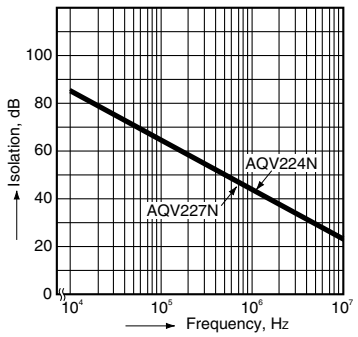
12. Output capacitance vs. applied voltage characteristics

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



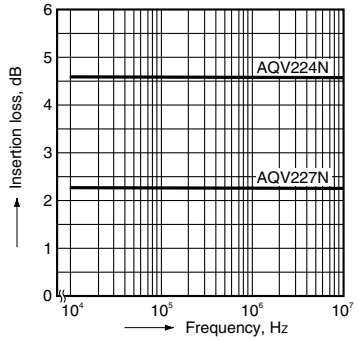
13. Isolation vs. frequency characteristics (50 Ω impedance)

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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