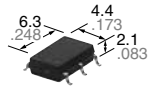
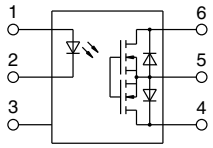
Miniature SOP6-pin type
Low on-resistance
200V/400V load voltage

PhotoMOS®
RF SOP 1 Form A
Low on-resistance (AQV22○NS)



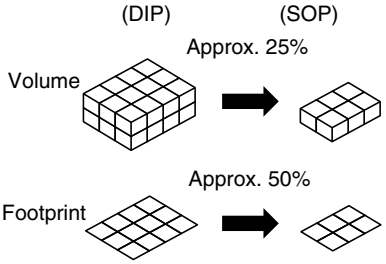
mm inch



RoHS compliant

FEATURES

1. Miniature SOP4-pin package
(W) 4.4 × (L) 6.3 × (H) 2.1 mm (W) .173× (L) .248× (H) .083 inch —approx. 25% of the volume and 50% of the footprint size of DIP type PhotoMOS.



2. Low output capacitance and high response speed
The capacitance between output terminals is small; Typ. 10pF. This enables a fast operation speed of Typ. 0.1ms (AQY224NS).

3. Low-level off state leakage current
4. Controls low-level analog signals

TYPICAL APPLICATIONS

- Telephones
- Measuring instruments
- Computers
- Industrial robots
- High-speed inspection machines

TYPES

	Output rating*		Package	Part No.			Packing quantity	
	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	50 mA	SOP6-pin	AQV227NS	AQV227NSX	AQV227NSZ	1 tube contains: 75 pcs. 1 batch contains: 1,000 pcs.	1,000 pcs.
	400 V	40 mA		AQV224NS	AQV224NSX	AQV224NSZ		

*Indicate the peak AC and DC values.
Note: For space reasons, the two initial letters of the part number "AQ" and the packing style indicator "X" or "Z" are not marked on the device.
(Ex. the label for product number AQV227NS is V227NS)

RATING

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

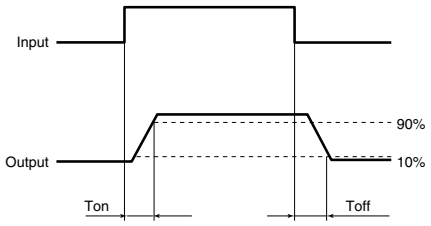
Item		Symbol	Type of connection	AQV227NS	AQV224NS	Remarks
Input	LED forward current	I_F		50 mA		
	LED reverse voltage	V_R		5 V		
	Peak forward current	I_{FP}		1 A		f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}		75 mW		
Output	Load voltage (peak AC)	V_L		200 V	400 V	
	Continuous load current	I_L	A	0.05 A	0.04 A	A connection: Peak AC, DC B, C connection: DC
			B	0.06 A	0.05 A	
			C	0.08 A	0.06 A	
	Peak load current	I_{peak}		0.15 A	0.12 A	A connection: 100 ms (1 shot), V_L = DC
	Power dissipation	P_{out}		450 mW		
Total power dissipation		P_T		500 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	AQV227NS	AQV224NS	Condition
Input	LED operate current	Typical	I_{Fon}	—	0.7 mA		I_L = Max.
		Maximum			3 mA		
	LED turn off current	Minimum	I_{Foff}	—	0.4 mA		I_L = Max.
		Typical			0.65 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	Maximum	I_{leak}	—	*10 nA		I_F = 0 V_L = Max.
Transfer characteristics	Turn on time**	Typical	T_{on}	—	0.12 ms	0.1 ms	I_F = 5 mA I_L = Max.
		Maximum			0.5 ms		
	Turn off time**	Typical	T_{off}	—	0.05 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
AQV227NS	Load voltage (Peak AC)	V_L	—	160	V
	Continuous load current (A connection)	I_L	—	0.05	A
AQV224NS	Load voltage (Peak AC)	V_L	—	320	V
	Continuous load current (A connection)	I_L	—	0.04	A

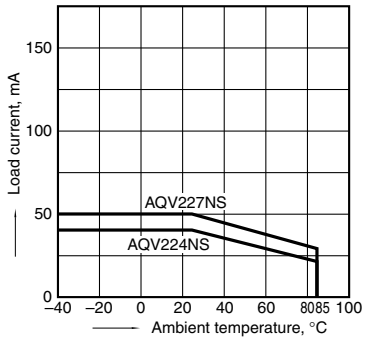
■ **These products are not designed for automotive use.**
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

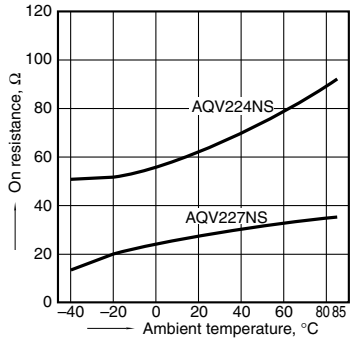
Allowable ambient temperature: –40 to +85°C
–40 to +185°F

Type of connection: A



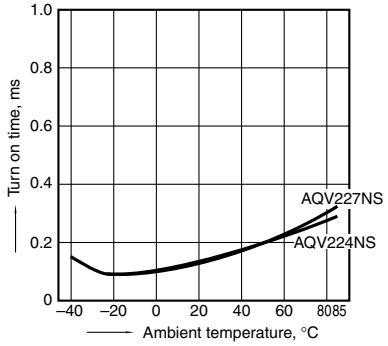
2. On resistance vs. ambient temperature characteristics

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



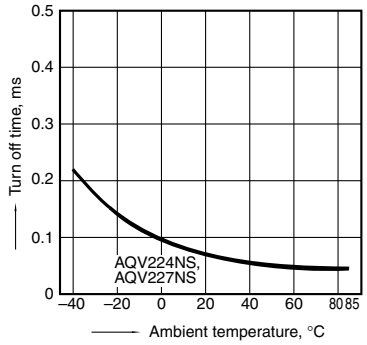
3. Turn on time vs. ambient temperature characteristics

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



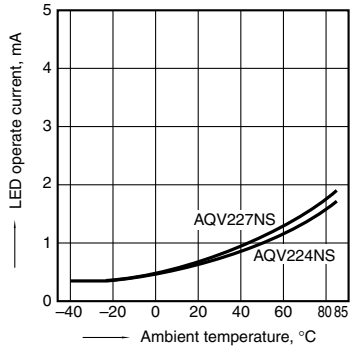
4. Turn off time vs. ambient temperature characteristics

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



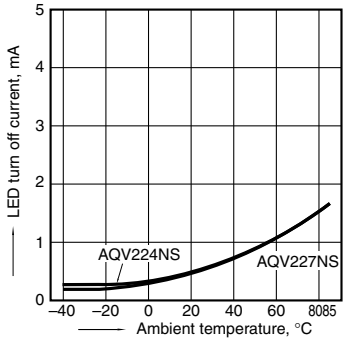
5. LED operate current vs. ambient temperature characteristics

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



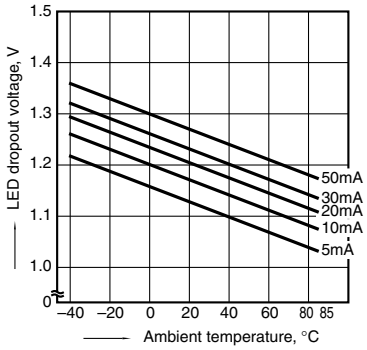
6. LED turn off current vs. ambient temperature characteristics

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



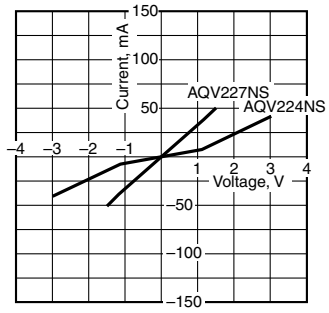
7. LED dropout voltage vs. ambient temperature characteristics

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



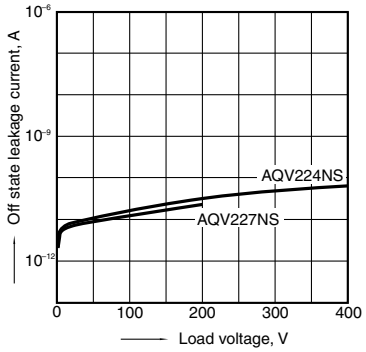
8. Current vs. voltage characteristics of output at MOS portion

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



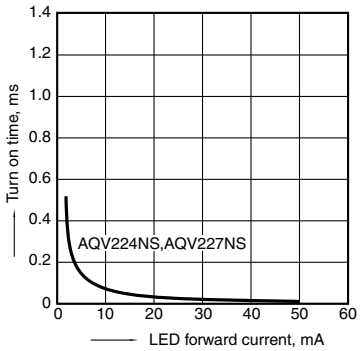
9. Off state leakage current vs. load voltage characteristics

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



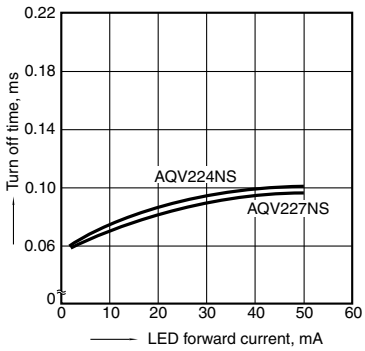
10. Turn on time vs. LED forward current characteristics

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



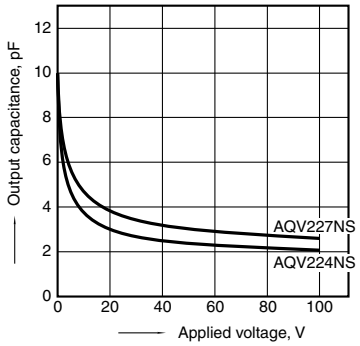
11. Turn off time vs. LED forward current characteristics

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



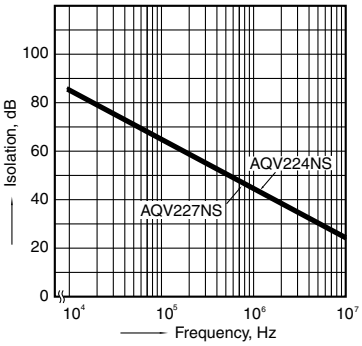
12. Output capacitance vs. applied voltage characteristics

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



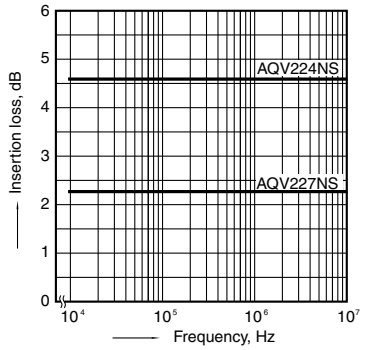
13. Isolation vs. frequency characteristics (50 Ω impedance)

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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