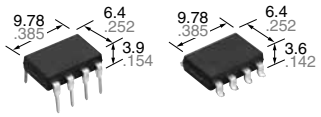
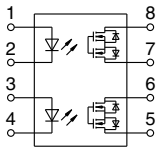
DIP8-pin type featuring low on-resistance 200V/400V load voltage

PhotoMOS®
RF 2 Form A
Low on-resistance (AQW22○N)



(Height includes standoff)

mm inch



RoHS compliant

FEATURES

1. 2-channels (Form A) type with high response speed, low leakage current and low on-resistance.
2. Applicable for 2 Form A use as well as two independent 1 Form A use
3. Low capacitance between output terminals ensures high response speed:
The capacitance between output terminals is small; Typ. 10 pF.
This enables for a fast operation speed of Typ. 0.2 ms.
4. High sensitivity and low on-resistance:
Max. 0.07 A of load current can be controlled with input current of 5 mA.
The on-resistance is less than our conventional models.
5. Low-level off state leakage current
6. Controls low-level analog signals:
PhotoMOS features extremely low closed-circuit offset voltages to enable control of small analog signals without distortion.

TYPICAL APPLICATIONS

- **Measuring instruments**
  Scanner, IC checker, Board tester, etc.
- Telephones
- Computer input machines
- Industrial 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	50 mA	DIP8-pin	AQW227N	AQW227NA	AQW227NAX	AQW227NAZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs.
	400 V	40 mA		AQW224N	AQW224NA	AQW224NAX	AQW224NAZ		

*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)

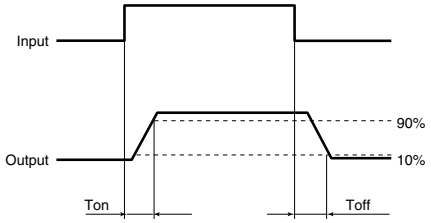
Item		Symbol	AQW227N(A)	AQW224N(A)	Remarks
Input	LED forward current	I_F	50 mA		
	LED reverse voltage	V_R	5 V		
	Peak forward current	I_{FP}	1 A		f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW		
Output	Load voltage (peak AC)	V_L	200 V	400 V	
	Continuous load current	I_L	0.05 A (0.07 A)	0.04 A (0.05 A)	Peak AC, DC ( ): in case of using only 1 channel
	Peak load current	I_{peak}	0.15 A	0.12 A	100 ms (1 shot), V_L = DC
	Power dissipation	P_{out}	800 mW		
Total power dissipation		P_T	850 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	AQW227N(A)	AQW224N(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		0.8 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}	30 Ω	70 Ω	I_F = 5 mA I_L = Max. Within 1 s
		Maximum		50 Ω	100 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}	0.2 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	Number of used channels	Min.	Max.	Unit
LED current		I_F		5	30	mA
AQW227N(A)	Load voltage (Peak AC)	V_L		—	160	V
	Continuous load current	I_L	1ch 2ch	—	0.07 0.05	A
AQW224N(A)	Load voltage (Peak AC)	V_L		—	320	V
	Continuous load current	I_L	1ch 2ch	—	0.05 0.04	A

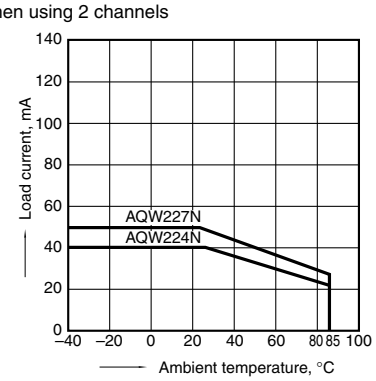
■ **These products are not designed for automotive use.**
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

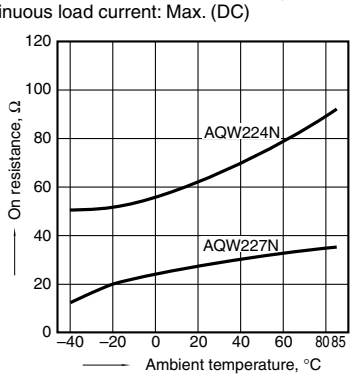
Allowable ambient temperature: –40 to +85°C
–40 to +185°F

When using 2 channels



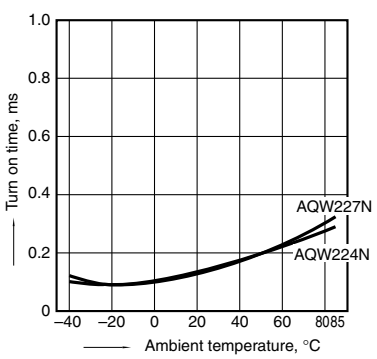
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8; LED current: 5 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



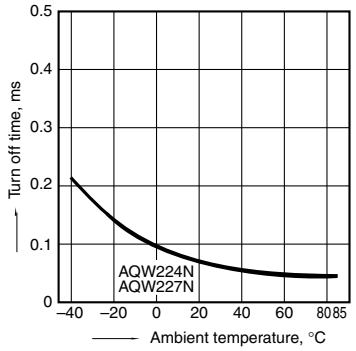
3. Turn on time vs. ambient temperature characteristics

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



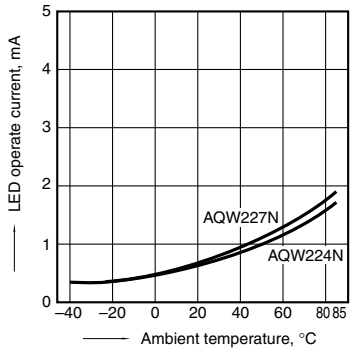
4. Turn off time vs. ambient temperature characteristics

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



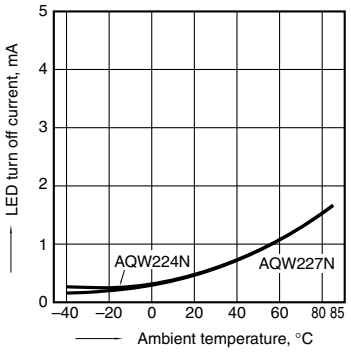
5. LED operate current vs. ambient temperature characteristics

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



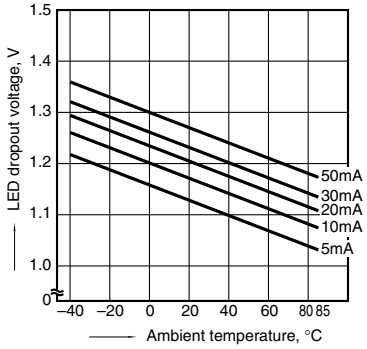
6. LED turn off current vs. ambient temperature characteristics

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



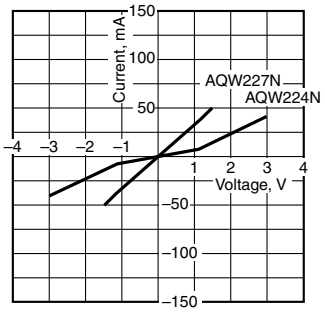
7. LED dropout voltage vs. ambient temperature characteristics

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



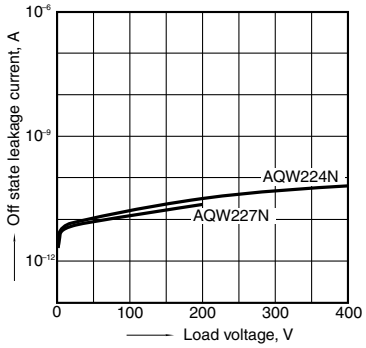
8. Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



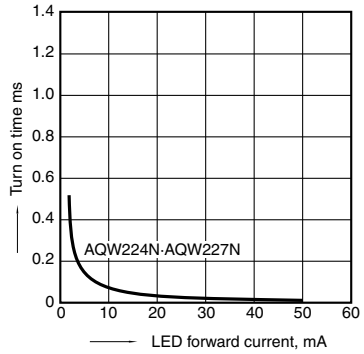
9. Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Ambient temperature: 25°C 77°F



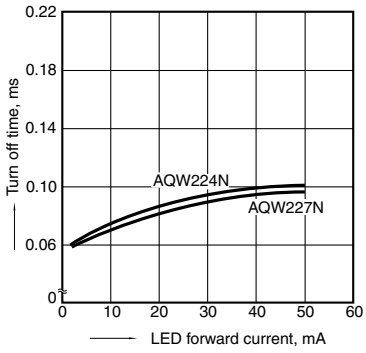
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: Max. (DC);
Continuous load current: Max. (DC);
Ambient temperature: 25°C 77°F



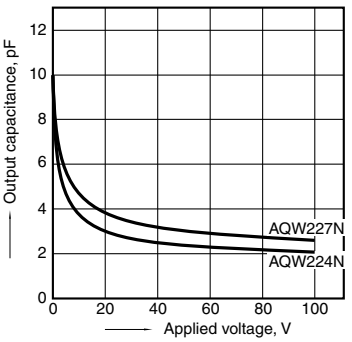
11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Load voltage: Max. (DC);
Continuous load current: Max. (DC);
Ambient temperature: 25°C 77°F



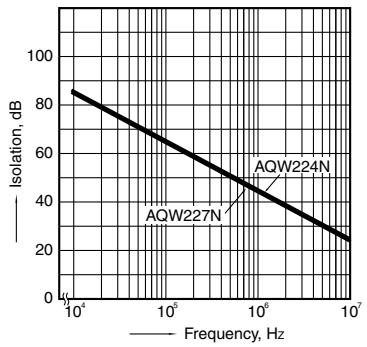
12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8; Frequency: 1 MHz, 30mVrms;
Ambient temperature: 25°C 77°F



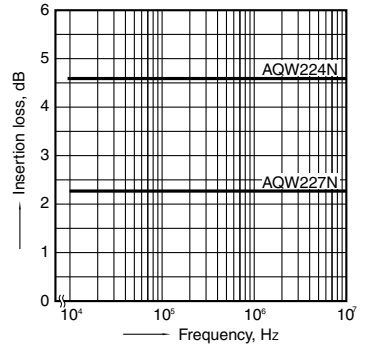
13. Isolation vs. frequency characteristics (50 Ω impedance)

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



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

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



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