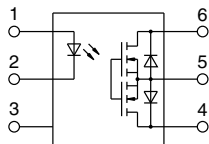
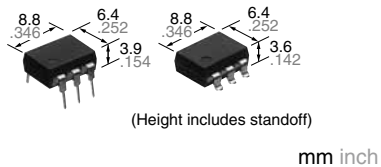




**DIP6-pin type featuring  
low on-resistance  
200V/400V load voltage**

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



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		Tube	Tape and reel	
	Load voltage	Load current			Tube packing style				Tape and reel packing style
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 <sub>F</sub>	50 mA			
	LED reverse voltage	V <sub>R</sub>	5 V			
	Peak forward current	I <sub>FP</sub>	1 A		f = 100 Hz, Duty factor = 0.1%	
	Power dissipation	P <sub>in</sub>	75 mW			
Output	Load voltage (peak AC)	V <sub>L</sub>	200 V	400 V		
	Continuous load current	I <sub>L</sub>	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 <sub>peak</sub>	0.21 A		A connection: 100 ms (1 shot), V <sub>L</sub> = DC	
Power dissipation	P <sub>out</sub>	360 mW				
Total power dissipation	P <sub>T</sub>	410 mW				
I/O isolation voltage	V <sub>iso</sub>	1,500 Vrms				
Ambient temperature	Operating	T <sub>opr</sub>	-40 to +85°C -40 to +185°F		(Non-icing at low temperatures)	
	Storage	T <sub>stg</sub>	-40 to +100°C -40 to +212°F			

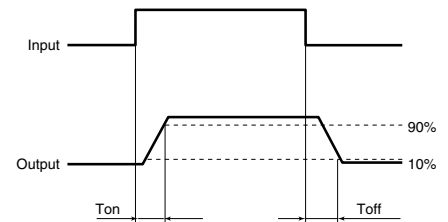
# RF 1 Form A Low on-resistance (AQV22○N)

## 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 <sub>Fon</sub>	—	0.9 mA		I <sub>L</sub> = Max.
		Maximum			3.0 mA		
	LED turn off current	Minimum	I <sub>Foff</sub>	—	0.4 mA		I <sub>L</sub> = Max.
		Typical			0.85 mA		
	LED dropout voltage	Typical	V <sub>F</sub>	—	1.25 V (1.14 V at I <sub>F</sub> = 5 mA)		I <sub>F</sub> = 50 mA
		Maximum			1.5 V		
Output	On resistance	Typical	R <sub>on</sub>	A	30 Ω	70 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s
		Maximum			50 Ω	100 Ω	
		Typical	R <sub>on</sub>	B	16 Ω	55 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s
		Maximum			25 Ω	70 Ω	
		Typical	R <sub>on</sub>	C	8 Ω	28 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s
		Maximum			12.5 Ω	35 Ω	
	Output capacitance	Typical	C <sub>out</sub>	—	10 pF		I <sub>F</sub> = 0 V <sub>B</sub> = 0 f = 1 MHz
		Maximum			15 pF		
	Off state leakage current	Typical	I <sub>Leak</sub>	—	0.03 nA	0.09 nA	I <sub>F</sub> = 0 V <sub>L</sub> = Max.
		Maximum			*10 nA		
Transfer characteristics	Turn on time**	Typical	T <sub>on</sub>	—	0.2 ms		I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum			0.5 ms		
	Turn off time**	Typical	T <sub>off</sub>	—	0.08 ms		I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum			0.2 ms		
	I/O capacitance	Typical	C <sub>iso</sub>	—	0.8 pF		f = 1 MHz V <sub>B</sub> = 0
		Maximum			1.5 pF		
Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	—	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 <sub>F</sub>	5	30	mA
AQV227N(A)	Load voltage (Peak AC)	V <sub>L</sub>	—	160	V
	Continuous load current (A connection)	I <sub>L</sub>	—	0.07	A
AQV224N(A)	Load voltage (Peak AC)	V <sub>L</sub>	—	320	V
	Continuous load current (A connection)	I <sub>L</sub>	—	0.05	A

■ These products are not designed for automotive use.

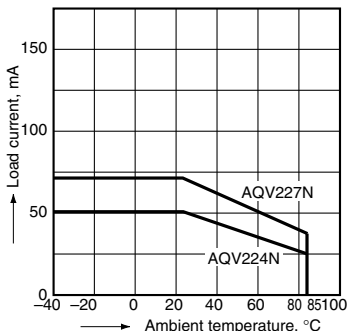
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

**REFERENCE DATA**

**1. Load current vs. ambient temperature characteristics**

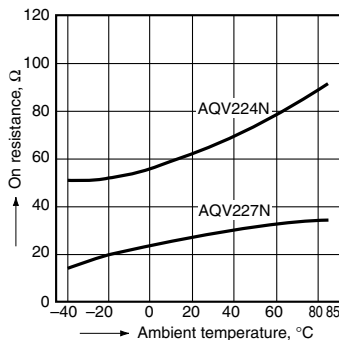
Allowable ambient temperature: -40 to +85°C  
-40 to +185°F

Type of connection: A



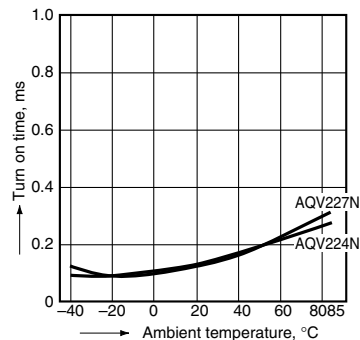
**2. On resistance vs. ambient temperature characteristics**

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



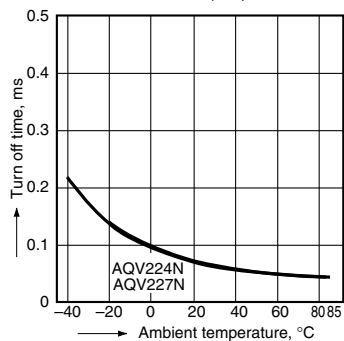
**3. Turn on time vs. ambient temperature characteristics**

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



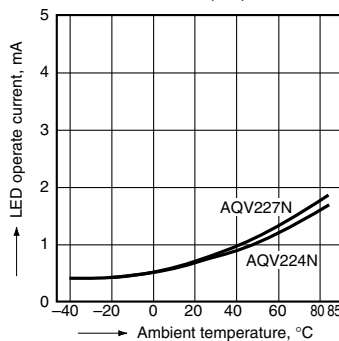
**4. Turn off time vs. ambient temperature characteristics**

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



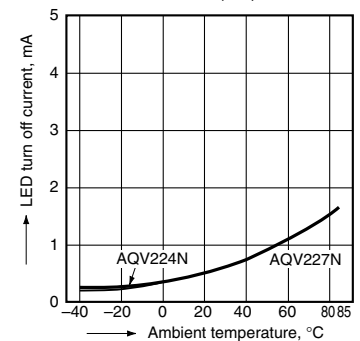
**5. LED operate current vs. ambient temperature characteristics**

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



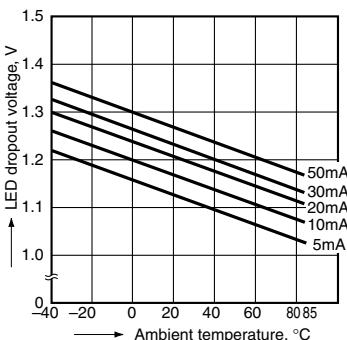
**6. LED turn off current vs. ambient temperature characteristics**

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



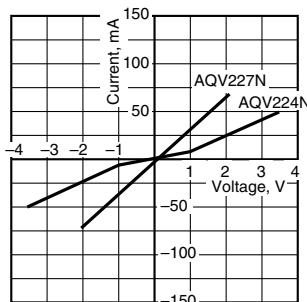
**7. LED dropout voltage vs. ambient temperature characteristics**

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



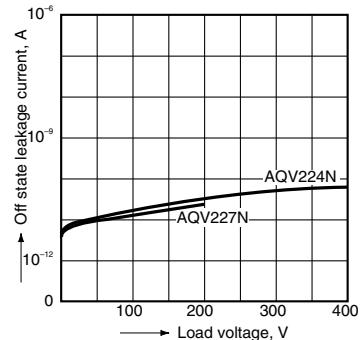
**8. Current vs. voltage characteristics of output at MOS portion**

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



**9. Off state leakage current vs. load voltage characteristics**

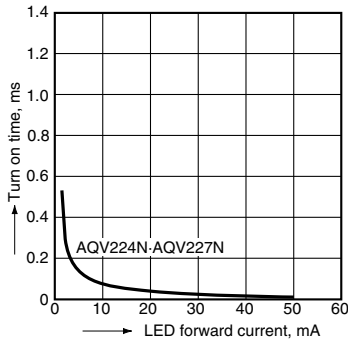
Sample: AQV227N, AQV224N;  
Measured portion: between terminals 4 and 6;  
Ambient temperature: 25°C 77°F



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

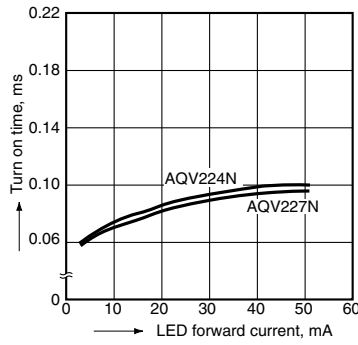
## 10. Turn on time vs. LED forward current characteristics

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



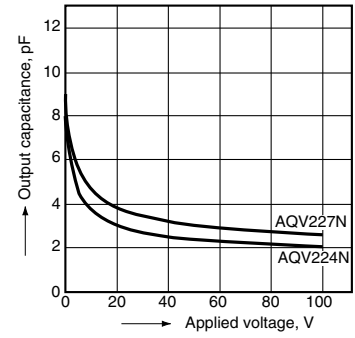
## 11. Turn off time vs. LED forward current characteristics

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



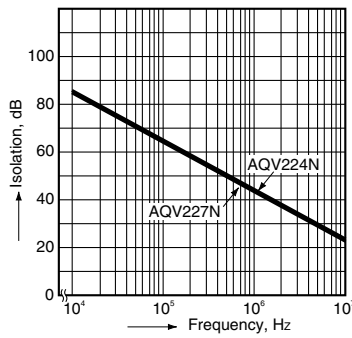
## 12. Output capacitance vs. applied voltage characteristics

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



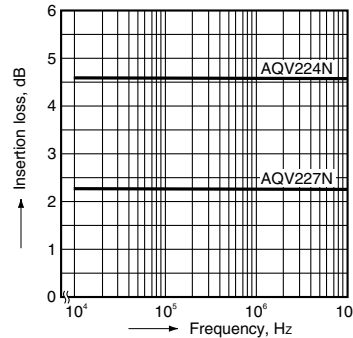
## 13. Isolation vs. frequency characteristics (50 Ω impedance)

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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Please contact .....

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