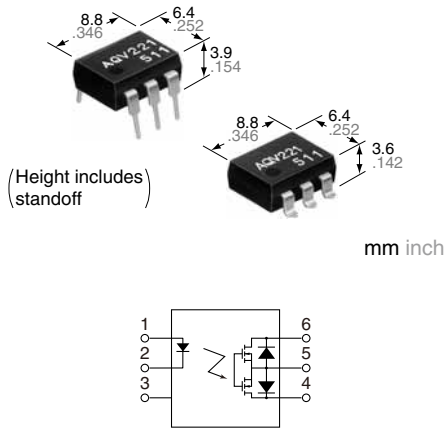




1 Form A type Radio frequent switching

PhotoMOS[®] RF 1 Form A (AQV22○)



FEATURES

1. High frequency characteristics with low capacitance between output terminals

Low output capacitance: typ. 4.8 pF
Isolation loss: 40 dB or more (at 1 MHz)
(AQV225)

2. High speed switching

Turn on time: typ. 0.1 ms
Turn off time: typ. 0.03 ms

3. Low-level off state leakage current of typ. 0.03 nA

4. Controls low-level analog signals

PhotoMOS[®] features extremely low closed-circuit offset voltages to enable control of small analog signals without distortion.

TYPICAL APPLICATIONS

1. Measuring instruments
Scanner, IC checker, Board tester, etc.
2. Audio visual equipment
CD, VCR
3. Security equipment

RoHS compliant

TYPES

	Output rating*		Package	Part No.				Packing quantity	
	Load voltage	Load current		Through hole terminal	Surface-mount terminal		Tube	Tape and reel	
					Tape and reel packing style				
			Tube packing style	Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side				
AC/DC dual use	40 V	80 mA	DIP6-pin	AQV221	AQV221A	AQV221AX	AQV221AZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs
	80 V	50 mA		AQV225	AQV225A	AQV225AX	AQV225AZ		

*Indicate the peak AC and DC values.

Note: The surface mount terminal shape 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	AQV221(A)	AQV225(A)	Remarks
Input	LED forward current	I_F		50 mA		
	LED reverse voltage	V_R		5 V		
	Peak forward current	I_{FP}		1 A		$f = 100 \text{ Hz}$, Duty factor = 0.1%
	Power dissipation	P_{in}		75 mW		
Load voltage (peak AC)		V_L		40 V	80 V	
Output	Continuous load current	I_L	A	0.08 A	0.05 A	A connection: Peak AC, DC B, C connection: DC
			B	0.09 A	0.06 A	
			C	0.12 A	0.075 A	
	Peak load current	I_{peak}		0.18 A	0.15 A	A connection: 100 ms (1 shot), $V_L = \text{DC}$
Power dissipation		P_{out}		230 mW		
Total power dissipation		P_T		280 mW		
I/O isolation voltage		V_{iso}		1,500 V AC		
Temperature limits	Operating	T_{opr}		-40°C to +85°C -40°F to +185°F		Non-condensing at low temperatures
	Storage	T_{stg}		-40°C to +100°C -40°F to +212°F		

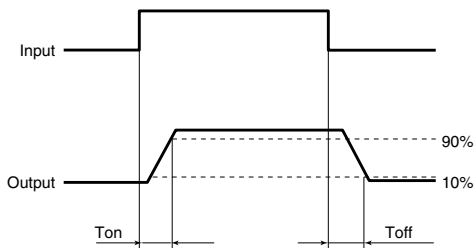
RF 1 Form A (AQV22○)

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

Item		Symbol	Type of connection	AQV221(A)	AQV225(A)	Remarks	
Input	LED operate current	Typical	I _{Fon}	0.9 mA		I _L = Max.	
		Maximum		3 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	22 Ω	36 Ω	I _F = 5 mA I _L = Max. Within 1 s on time
		Maximum			35 Ω	50 Ω	
		Typical	R _{on}	B	13 Ω	21 Ω	
		Maximum			18 Ω	25 Ω	
	Output capacitance	Typical	C _{out}	—	5.6 pF	4.8 pF	I _F = 0 mA V _B = 0 V f = 1 MHz
		Maximum			8 pF		
Off state leakage current	Typical	I _{Leak}	—	0.03 nA		I _F = 0 mA V _L = Max.	
	Maximum			10 nA (1 nA or less)*			
Transfer characteristics	Turn on time**	Typical	T _{on}	0.1 ms		I _F = 5 mA I _L = Max.	
		Maximum		0.3 ms			
	Turn off time**	Typical	T _{off}	0.03 ms		I _F = 5 mA I _L = Max.	
		Maximum		0.1 ms			
	I/O capacitance	Typical	C _{iso}	—	0.8 pF		f = 1 MHz V _B = 0 V
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



RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper device operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	I _F	5	mA

■ These products are not designed for automotive use.

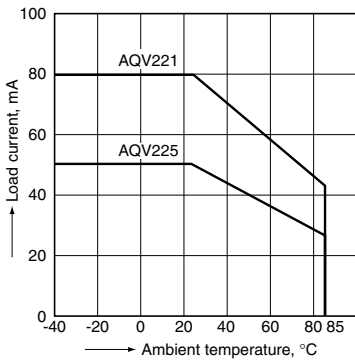
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

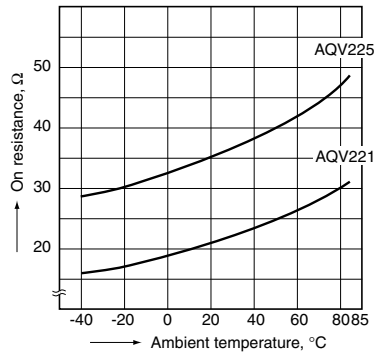
Allowable ambient temperature: -40°C to $+85^{\circ}\text{C}$
 -40°F to $+185^{\circ}\text{F}$

Type of connection: A



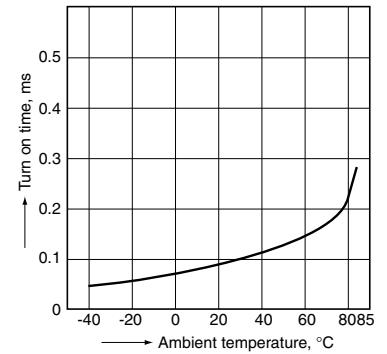
2. On resistance vs. ambient temperature characteristics

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



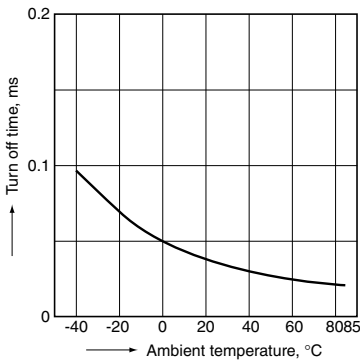
3. Turn on time vs. ambient temperature characteristics

Sample: AQV221, AQV225; LED current: 5 mA;
 Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



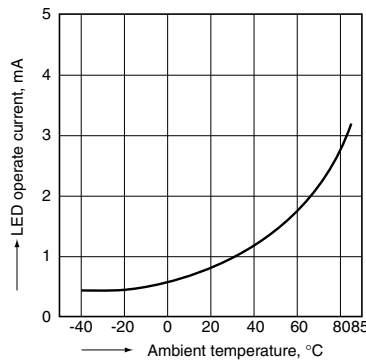
4. Turn off time vs. ambient temperature characteristics

Sample: AQV221, AQV225; LED current: 5 mA;
 Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



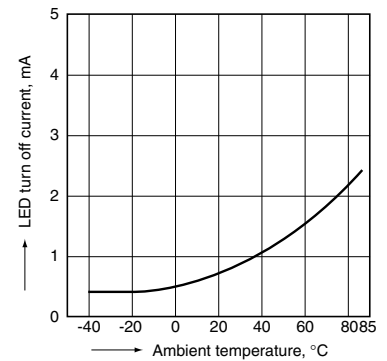
5. LED operate current vs. ambient temperature characteristics

Sample: AQV221, AQV225;
 Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



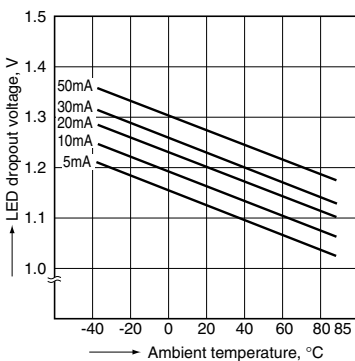
6. LED turn off current vs. ambient temperature characteristics

Sample: AQV221, AQV225;
 Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



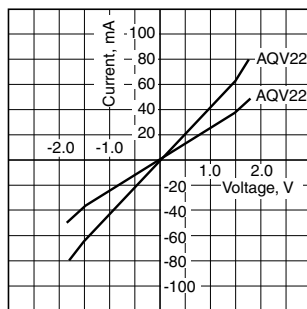
7. LED dropout voltage vs. ambient temperature characteristics

Sample: AQV221, AQV225;
 LED current: 5 to 50 mA



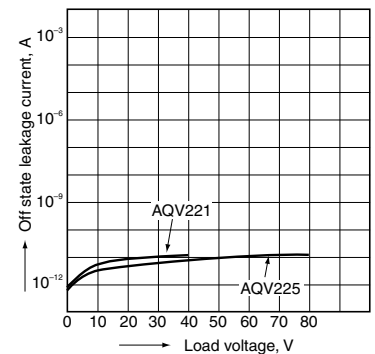
8. Current vs. voltage characteristics of output at MOS portion

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



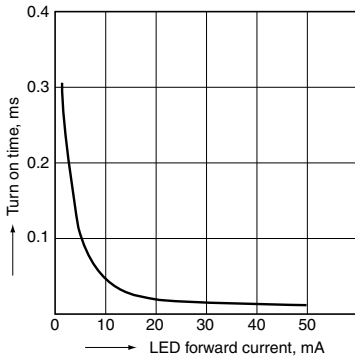
9. Off state leakage current vs. load voltage characteristics

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



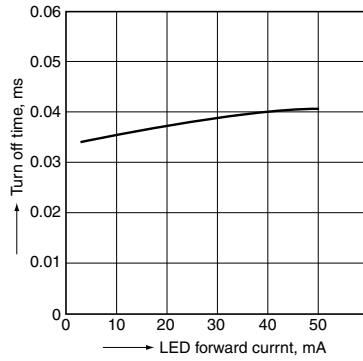
10. Turn on time vs. LED forward current characteristics

Sample: AQV221, AQV225;
 Measured portion: between terminals 4 and 6;
 Load voltage: Max. (DC);
 Continuous load current: Max. (DC);
 Ambient temperature: 25°C 77°F



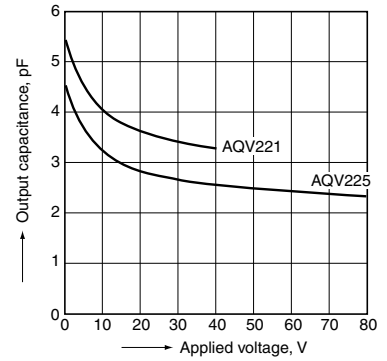
11. Turn off time vs. LED forward current characteristics

Sample: AQV221, AQV225;
 Measured portion: between terminals 4 and 6;
 Load voltage: Max. (DC);
 Continuous load current: Max. (DC);
 Ambient temperature: 25°C 77°F



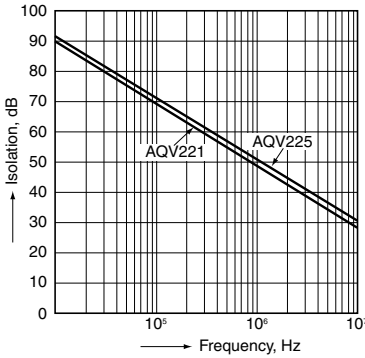
12. Output capacitance vs. applied voltage characteristics

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



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

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



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

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

