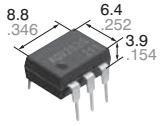
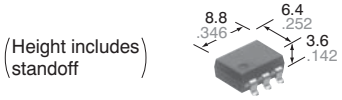
Panasonic
ideas for life

DIP6-pin type with new-generation MOS capable of 2A to 3A high-frequency switching

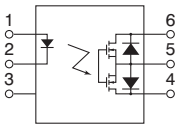
PhotoMOS®
HE 1 Form A
High Capacity (AQV25❍G)





CAD Data

mm inch



FEATURES

1. **Greatly increased load current in a compact DIP package**
   Continuous load current: 3.5A (AQV251G)
2. **Greatly improved specifications allow you to use this in place of mercury and mechanical relays.**
3. **Low on-resistance (typ. 35mΩ, AQV251G)**

TYPICAL APPLICATIONS

- **Measuring instrument market**
  (Testers etc.)
- **Industrial machinery and equipment**
- **Power supply controls**
- **Security/Disaster prevention market**
  I/O sections of warning devices, security systems

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	30 V	3.5 A	DIP6-pin	AQV251G	AQV251GA	AQV251GAX	AQV251GAZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs.
	60 V	2.5 A	DIP6-pin	AQV252G	AQV252GA	AQV252GAX	AQV252GAZ		

*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)

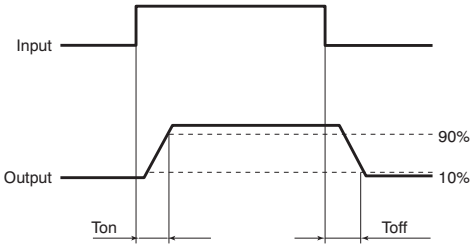
Item		Symbol	Type of connection	AQV251G(A)	AQV252G(A)	Remarks
Input	LED forward current	I_F		50 mA		
	LED reverse voltage	V_R		5 V		
	Peak forward current	I_{FP}		1 A		f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}		75 mW		
Output	Load voltage (peak AC)	V_L		30 V	60 V	
	Continuous load current	I_L	A	3.5 A	2.5 A	A connection: Peak AC, DC B, C connection: DC
			B	4.0 A	3.5 A	
			C	6.0 A	5.0 A	
	Peak load current	I_{peak}		6.0 A		100ms (1 shot), V_L = DC
	Power dissipation	P_{out}		500 mW		
Total power dissipation		P_T		550 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		

HE 1 Form A High Capacity (AQV25❍G)

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

Item			Symbol	Type of connection	AQV251G(A)	AQV252G(A)	Condition
Input	LED operate current	Typical	I_{Fon}	—	0.55 mA	0.5 mA	I_L = 100mA
		Maximum			3 mA	3 mA	
	LED turn off current	Minimum	I_{Foff}	—	0.2 mA	0.2 mA	I_L = 100mA
		Typical			0.45 mA	0.45 mA	
	LED dropout voltage	Typical	V_F	—	1.14 V (1.32 V at I_F = 50 mA)		I_F = 5 mA
		Maximum			1.5 V		
Output	On resistance	Typical	R_{on}	A	0.035 Ω	0.08 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
		Maximum			0.08 Ω	0.12 Ω	
		Typical	R_{on}	B	0.018 Ω	0.04 Ω	
		Maximum			0.04 Ω	0.06 Ω	
		Typical	R_{on}	C	0.01 Ω	0.02 Ω	
		Maximum			0.02 Ω	0.03 Ω	
	Off state leakage current	Maximum	I_{Leak}	—	1 μA		I_F = 0 mA, V_L = Max.
Transfer characteristics	Turn on time*	Typical	T_{on}	—	1.1 ms		I_F = 5 mA, I_L = 100 mA V_L = 10 V
		Maximum			5.0 ms		
	Turn off time*	Typical	T_{off}	—	0.1 ms	0.25 ms	I_F = 5 mA, I_L = 100 mA V_L = 10 V
		Maximum			0.5 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

*Turn on/Turn off time



RECOMMENDED OPERATING CONDITIONS

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

Item	Symbol	Recommended value	Unit
Input LED current	I_F	5 to 10	mA

■ Dimensions

■ Schematic and Wiring Diagrams

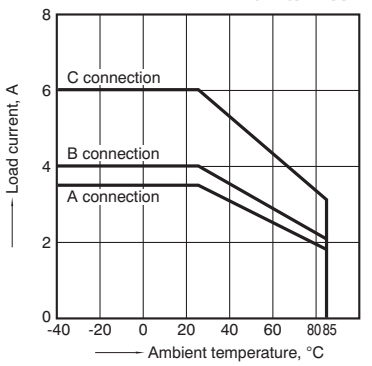
■ Cautions for Use

■ These products are not designed for automotive use.
If you are considering to use these products for automotive applications, please contact your local Panasonic technical representative.
Please refer to our information on PhotoMOS Relays for Automotive Applications.

REFERENCE DATA

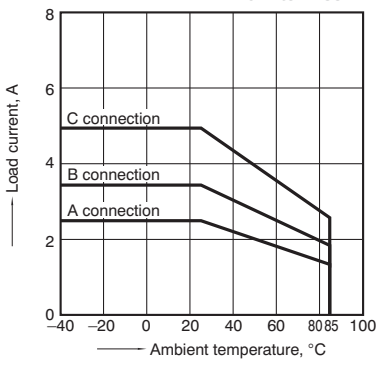
1-(1)Load current vs. ambient temperature characteristics

Tested sample: AQV251G:
Allowable ambient temperature: –40°C to +85°C
–40°F to +185°F



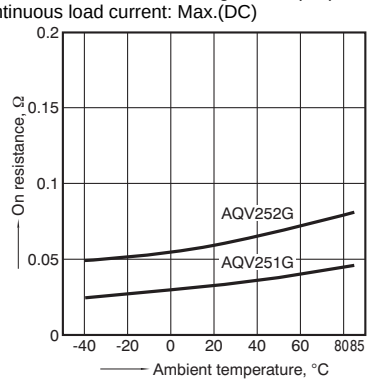
1-(2) Load current vs. ambient temperature characteristics

Tested sample: AQV252G:
Allowable ambient temperature:–40°C to +85°C
–40°F to +185°F



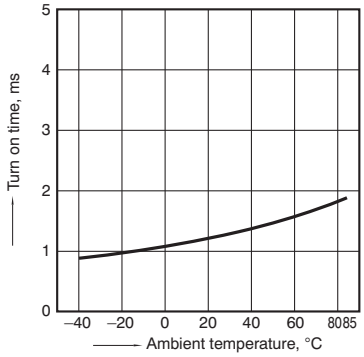
2. On resistance vs. ambient temperature characteristics

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



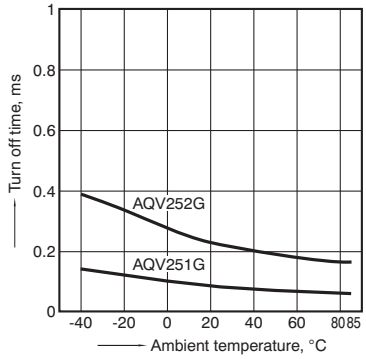
3. Turn on time vs. ambient temperature characteristics

Tested sample: All; LED current: 5 mA; Load voltage: 10 V (DC); Continuous load current: 100 mA (DC)



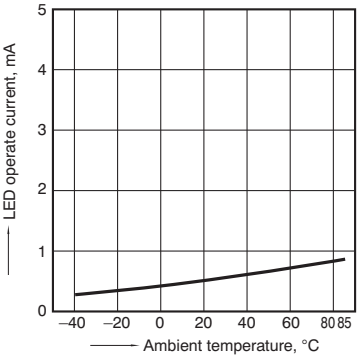
4. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10 V (DC); Continuous load current: 100 mA (DC)



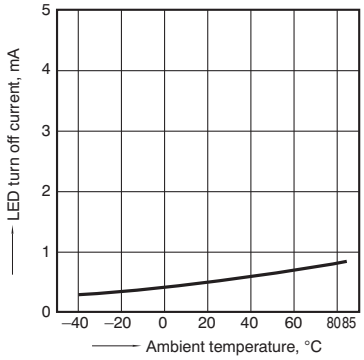
5. LED operate current vs. ambient temperature characteristics

Tested sample: All; Load voltage: 10 V (DC); Continuous load current: 100mA (DC)



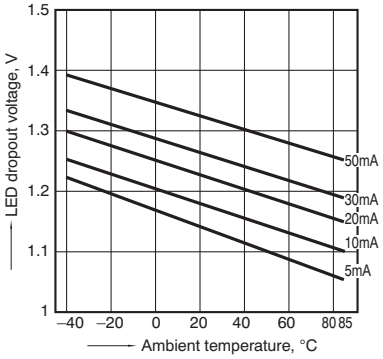
6. LED turn off current vs. ambient temperature characteristics

Tested sample: All; Load voltage: 10 V (DC); Continuous load current: 100mA (DC)



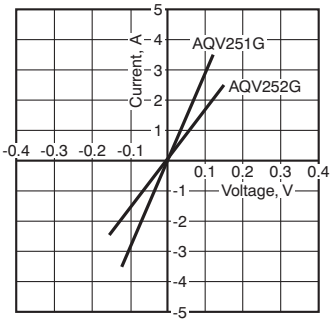
7. LED dropout voltage vs. ambient temperature characteristics

Tested sample: All;
LED current: 5 to 50mA



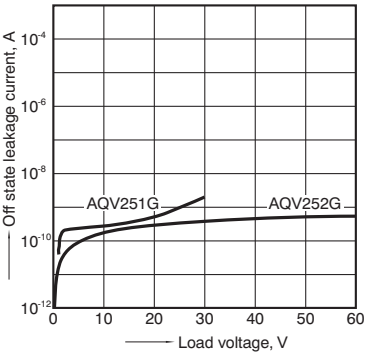
8. Current vs. voltage characteristics of output at MOS portion

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



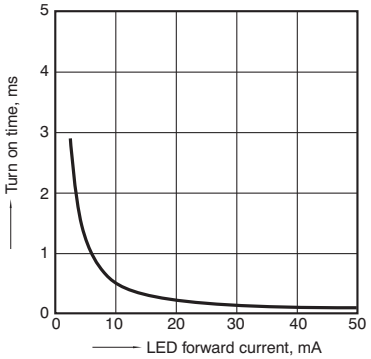
9. Off state leakage current vs. load voltage characteristics

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



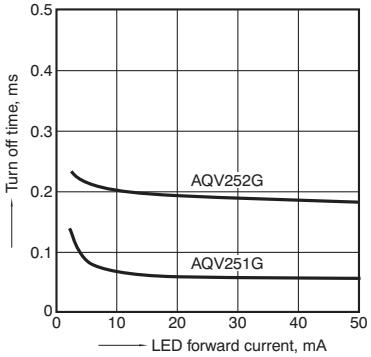
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
Tested sample: All; Load voltage: 10 V (DC);
Continuous load current: 100 mA (DC);
Ambient temperature: 25°C 77°F



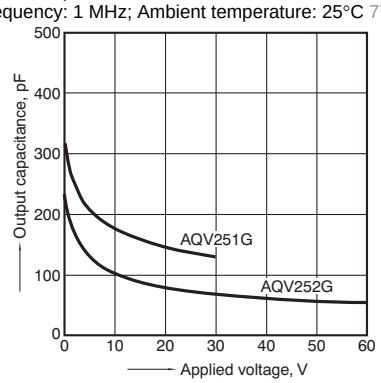
11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
Load voltage: 10 V (DC)
Continuous load current: 100 mA (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. Max. switching frequency

Tested sample: AQV251G;
LED current: 5mA,
Ambient temperature: 25°C 77°F