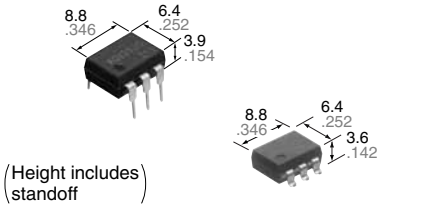
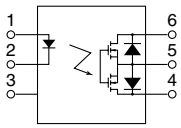
Panasonic
ideas for life

DIP 6-pin type with new-generation MOS capable of 2A to 3A high-frequency load switching.

PhotoMOS®
HE 1 Form A
High Capacity



mm inch



RoHS compliant

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, etc.

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

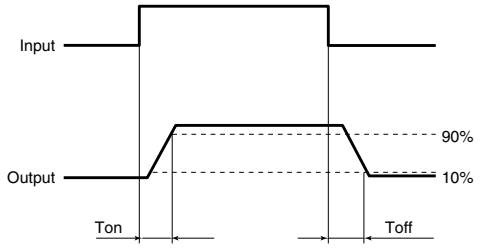
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

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}		600 mW		
Total power dissipation		P_T		650 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		

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
	Max. switching frequency	Maximum	—	—	10 times/s	—	I_F = 5 mA, duty = 50% $V_L \times I_L$ = 100 V·A

*Turn on/Turn off time



RECOMMENDED OPERATING CONDITIONS

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

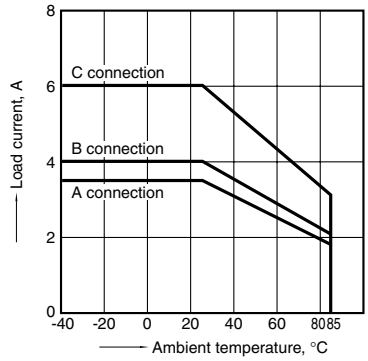
Item	Symbol	Recommended value	Unit
Input LED current	I_F	5 to 10	mA

■ **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

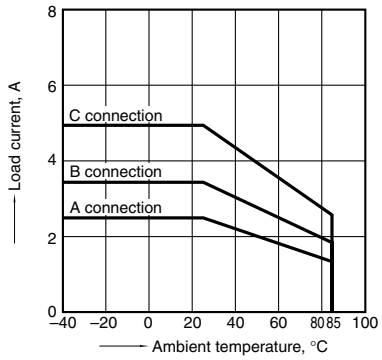
1.-(1) Load current vs. ambient temperature characteristics

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



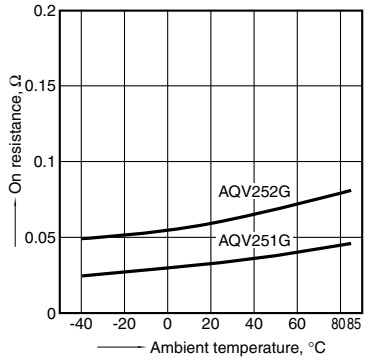
1.-(2) Load current vs. ambient temperature characteristics

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



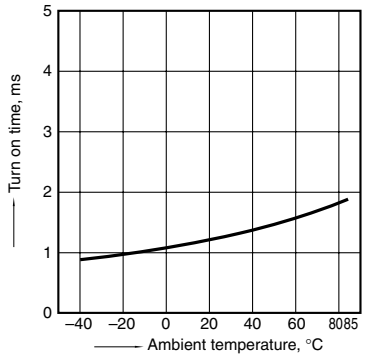
2. On resistance vs. ambient temperature characteristics

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



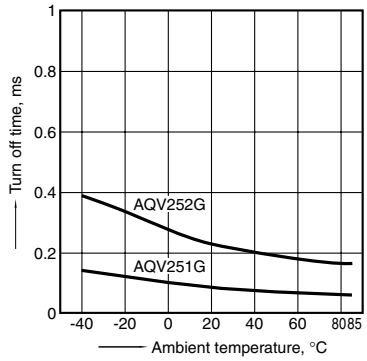
3. Turn on time vs. ambient temperature characteristics

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



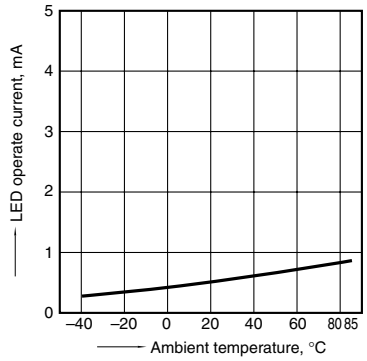
4. Turn off time vs. ambient temperature characteristics

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



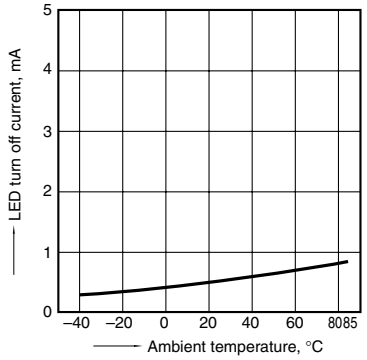
5. LED operate current vs. ambient temperature characteristics

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



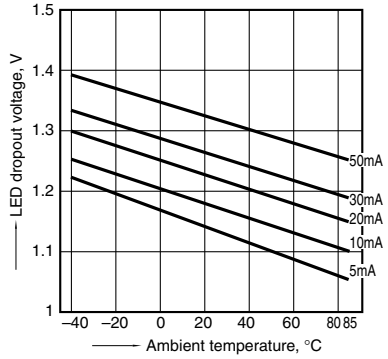
6. LED turn off current vs. ambient temperature characteristics

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



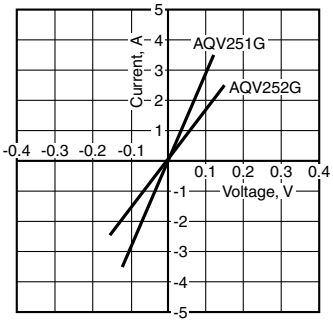
7. LED dropout voltage vs. ambient temperature characteristics

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



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

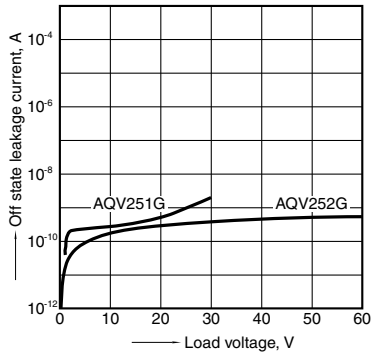
Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



HE 1 Form A High Capacity

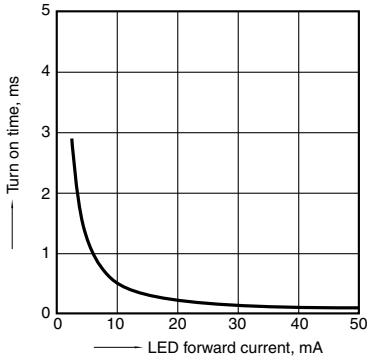
9. Off state leakage current vs. load voltage characteristics

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



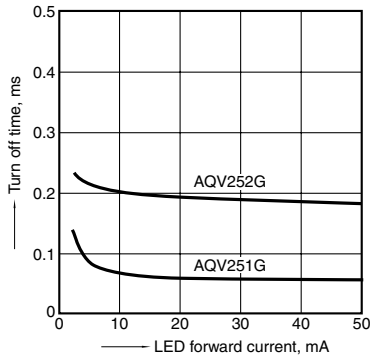
10. Turn on time vs. LED forward current characteristics

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



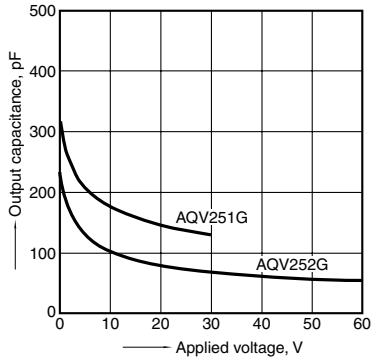
11. Turn off time vs. LED forward current characteristics

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: 5 mA;
Ambient temperature: 25°C 77°F