RATING

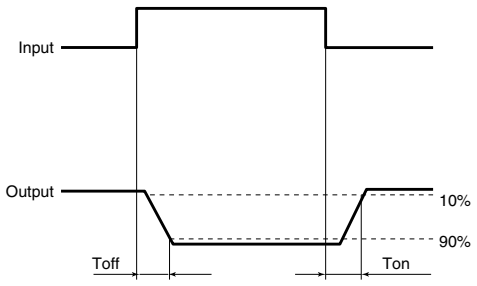
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item		Symbol	Type of connection	AQV414E(A)	AQV412EH(A)	AQV410EH(A)	AQV414EH(A)	Remarks
Input	LED forward current	I_F		50 mA				
	LED reverse voltage	V_R		5 V				
	Peak forwrd 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		400 V	60 V	350 V	400 V	
	Continuous load current	I_L	A	0.12 A	0.55 A	0.13 A	0.12 A	A connection: Peak AC, DC B,C connection: DC
			B	0.13 A	0.65 A	0.15 A	0.13 A	
			C	0.15 A	0.8 A	0.17 A	0.15 A	
	Peak load current	I_{peak}		0.3 A	1.5 A	0.4 A	0.3 A	A connection: 100 ms (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	5,000 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	AQV414E(A)	AQV412EH(A)	AQV410EH(A)	AQV414EH(A)	Condition
Input	LED operate (OFF) current	Typical	I_{Foff}	—	1.45 mA	1.9 mA			I_L= Max.
		Maximum			3.0 mA				
	LED reverse (ON) current	Minimum	I_{Fon}	—	0.3 mA	0.4 mA			I_L = Max.
		Typical			1.40 mA	1.8 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}	A	26 Ω	1 Ω	18 Ω	25.2 Ω	I_F = 0 mA I_L = Max. Within 1 s on time
		Maximum			50 Ω	2.5 Ω	35 Ω	50 Ω	
		Typical	R_{on}	B	20 Ω	0.55 Ω	13 Ω	19 Ω	I_F = 0 mA I_L = Max. Within 1 s on time
		Maximum			25 Ω	1.3 Ω	17.5 Ω	25 Ω	
		Typical	R_{on}	C	10 Ω	0.3 Ω	6.5 Ω	10 Ω	I_F = 0 mA I_L = Max. Within 1 s on time
		Maximum			12.5 Ω	0.7 Ω	8.8 Ω	12.5 Ω	
	Off state leakage current	Maximum	I_{Leak}	—	1 μA	10 μA			I_F = 5 mA V_L = Max.
Transfer characteristics	Operate (OFF) time*	Typical	T_{off}	—	0.7 ms	3 ms	1.5 ms	1.3 ms	I_F = 0 mA → 5 mA I_L = Max.
		Maximum			2.0 ms	8 ms	3.0 ms		
	Reverse (ON) time*	Typical	T_{on}	—	0.1 ms	0.3 ms			I_F = 5 mA → 0 mA I_L = Max.
		Maximum			1.0 ms	1.5 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

*Operate/Reverse 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	Standard type: 5 Reinforced type: 5 to 10	mA

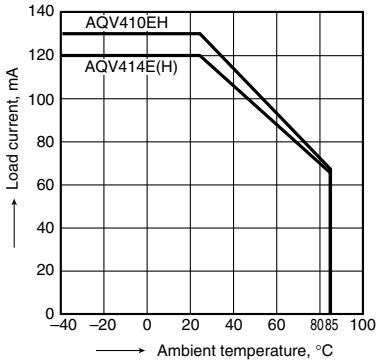
■ **These products are not designed for automotive use.**
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

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

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

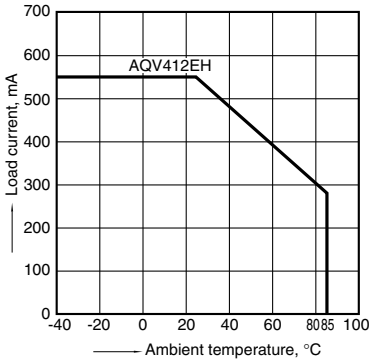
Type of connection: A



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

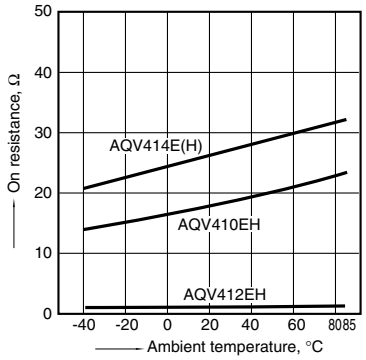
Allowable ambient temperature: –40°C to +85°C
–40°F to +185°F

Type of connection: A



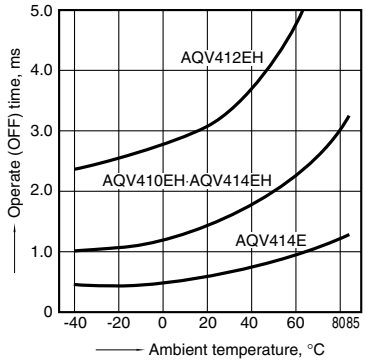
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 0 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



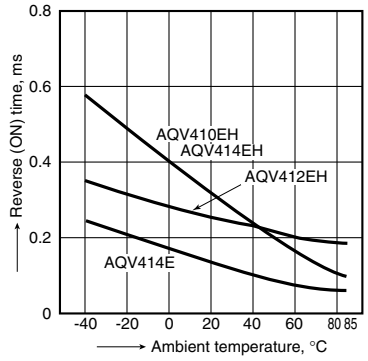
3. Operate (OFF) time vs. ambient temperature characteristics

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



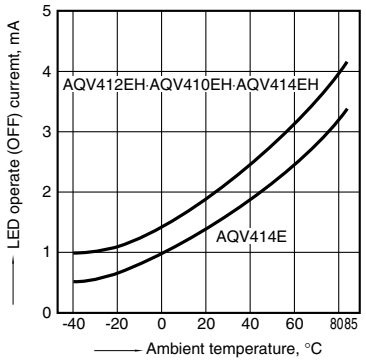
4. Reverse (ON) time vs. ambient temperature characteristics

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



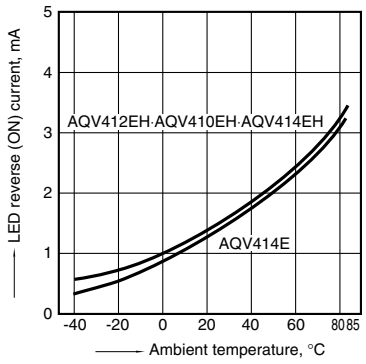
5. LED operate (OFF) current vs. ambient temperature characteristics

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



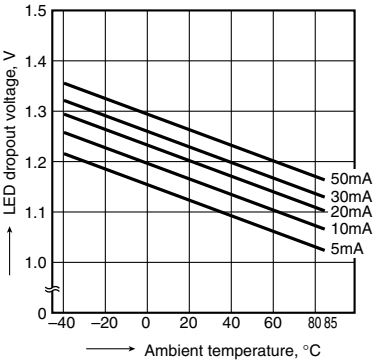
6. LED reverse (ON) current vs. ambient temperature characteristics

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



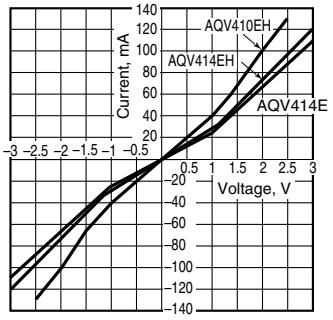
7. LED dropout voltage vs. ambient temperature characteristics

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



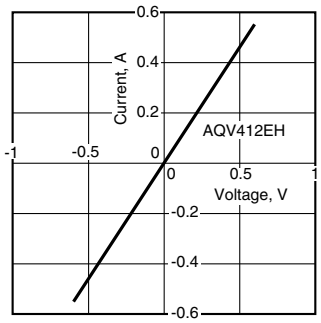
8-(1). Current vs. voltage characteristics of output at MOS portion

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



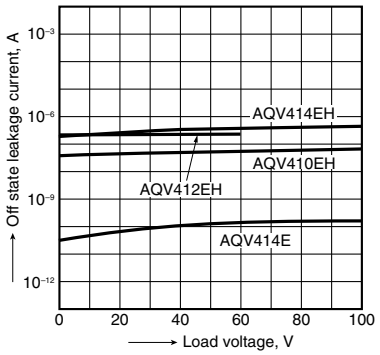
8-(2). Current vs. voltage characteristics of output at MOS portion

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



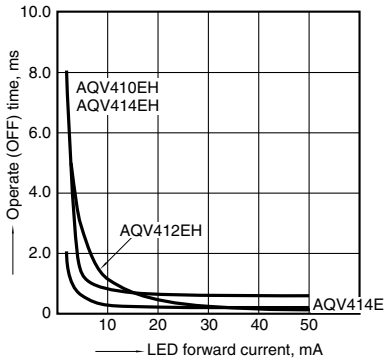
9. Off state leakage current vs. load voltage characteristics

Sample: All types;
Measured portion: between terminals 4 and 6;
LED current: 5 mA; Ambient temperature: 25°C 77°F



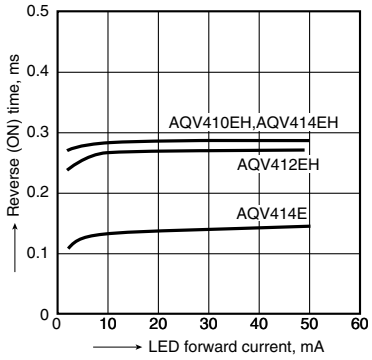
10. Operate (OFF) time vs. LED forward current characteristics

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



11. Reverse (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



12. Output capacitance vs. applied voltage characteristics

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