

RATING

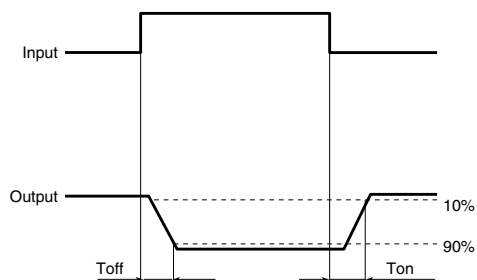
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

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			1.8 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 _{LLeak}	—	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.

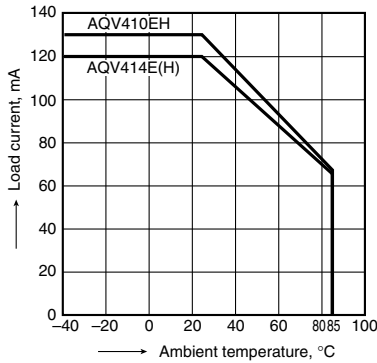
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

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

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

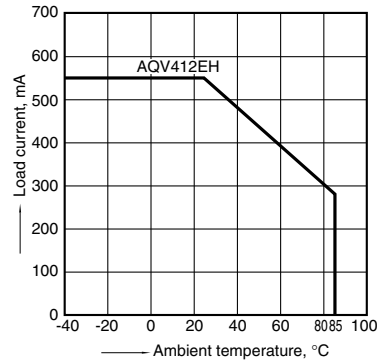
Type of connection: A



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

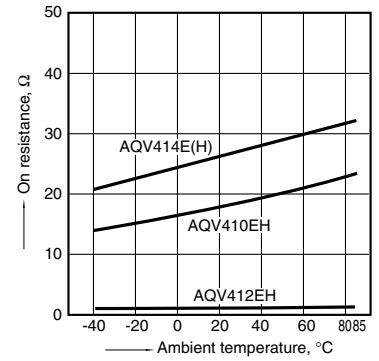
Allowable ambient temperature: -40°C to $+85^{\circ}\text{C}$
 -40°F to $+185^{\circ}\text{F}$

Type of connection: A



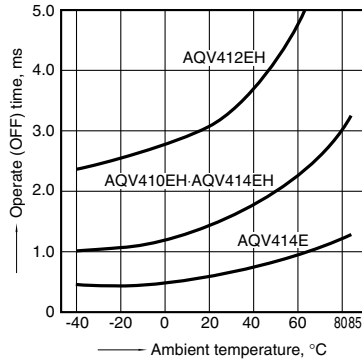
2. On resistance vs. ambient temperature characteristics

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



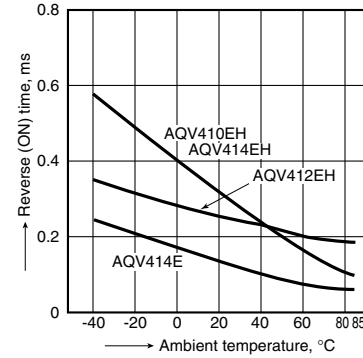
3. Operate (OFF) time vs. ambient temperature characteristics

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



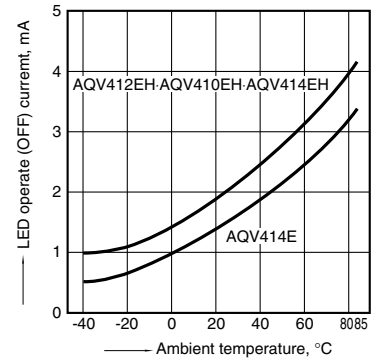
4. Reverse (ON) time vs. ambient temperature characteristics

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



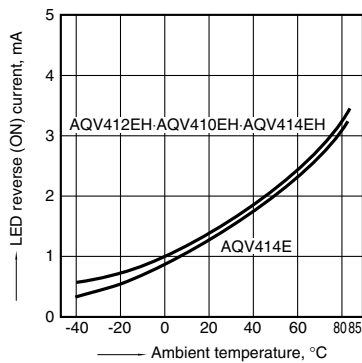
5. LED operate (OFF) current vs. ambient temperature characteristics

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



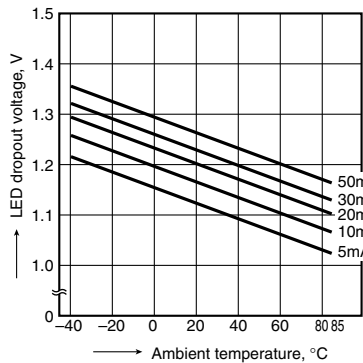
6. LED reverse (ON) current vs. ambient temperature characteristics

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



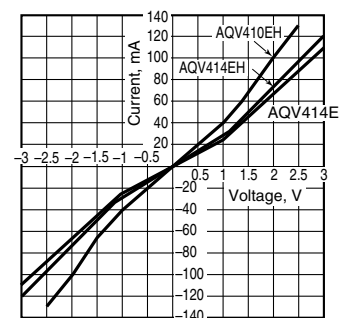
7. LED dropout voltage vs. ambient temperature characteristics

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

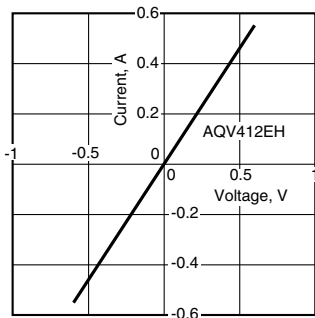


8-(1). Current vs. voltage characteristics of output at MOS portion

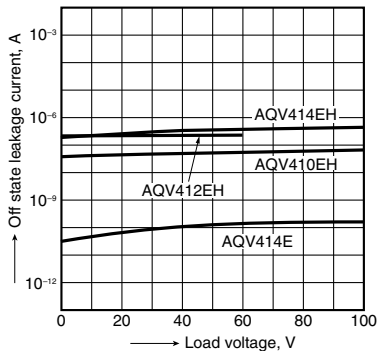
Measured portion: between terminals 4 and 6;
 Ambient temperature: 25°C 77°F



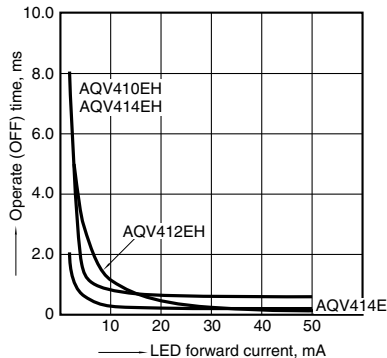
8-(2). Current vs. voltage characteristics of output at MOS portion
Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



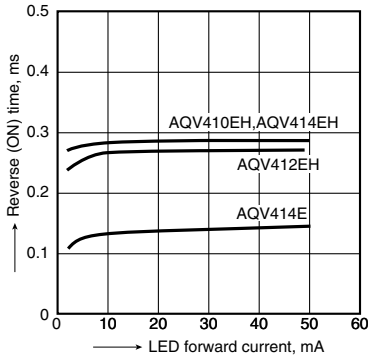
9. Off state leakage current vs. load voltage characteristics
Sample: All types;
Measured portion: between terminals 4 and 6;
LED current: 5 mA; Ambient temperature: 25°C 77°F



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

