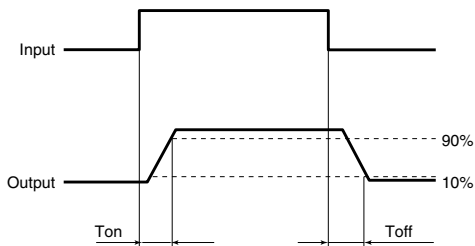


# GE 1 Form A (AQV210E, AQV210EH)

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

Item		Symbol	Type of connection	AQV210E(A)	AQV214E(A)	AQV210EH(A)	AQV214EH(A)	Condition	
Input	LED operate current	Typical	I <sub>Fon</sub>	1.1 mA		1.6 mA		I <sub>L</sub> = Max.	
		Maximum		3 mA					
	LED turn off current	Minimum	I <sub>Foff</sub>	0.3 mA		0.4 mA		I <sub>L</sub> = Max.	
		Typical		1.0 mA		1.5 mA			
LED dropout voltage	Typical	V <sub>F</sub>	—	1.25 V (1.14 V at I <sub>F</sub> = 5 mA)				I <sub>F</sub> = 50 mA	
	Maximum			1.5 V					
Output	On resistance	Typical	R <sub>on</sub>	A	23 Ω	30 Ω	23 Ω	30 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s on time
		Maximum			35 Ω	50 Ω	35 Ω	50 Ω	
		Typical	R <sub>on</sub>	B	11.5 Ω	22.5 Ω	11.5 Ω	22.5 Ω	I <sub>F</sub> = 5 mA I <sub>L</sub> = Max. Within 1 s on time
		Maximum			17.5 Ω	25 Ω	17.5 Ω	25 Ω	
	Off state leakage current	Maximum	I <sub>Leak</sub>	—	1 μA				I <sub>F</sub> = 0 mA V <sub>L</sub> = Max.
					Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	1,000 MΩ	
Transfer characteristics	Turn on time*	Typical	T <sub>on</sub>	—	0.5 ms		0.7 ms		I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum			2.0 ms				
	Turn off time*	Typical	T <sub>off</sub>	—	0.05 ms				I <sub>F</sub> = 5 mA I <sub>L</sub> = Max.
		Maximum			1.0 ms				
I/O capacitance	Typical	C <sub>iso</sub>	—	0.8 pF				f = 1 MHz V <sub>B</sub> = 0 V	
	Maximum			1.5 pF					

\*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 <sub>F</sub>	Standard type: 5 Reinforced type: 5 to 10	mA

■ These products are not designed for automotive use.

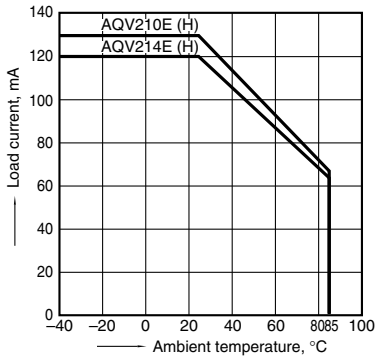
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

## REFERENCE DATA

### 1. Load current vs. ambient temperature characteristics

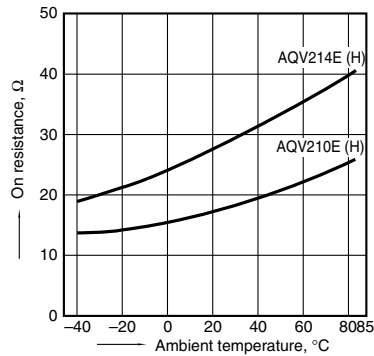
Allowable ambient temperature:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$   
 $-40^{\circ}\text{F}$  to  $+185^{\circ}\text{F}$

Type of connection: A



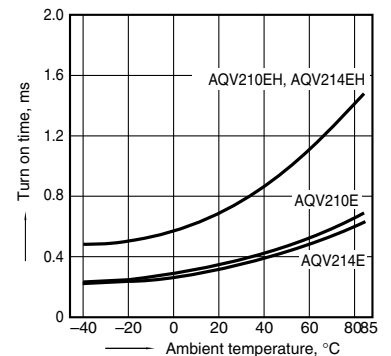
### 2. On-resistance vs. ambient temperature characteristics

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



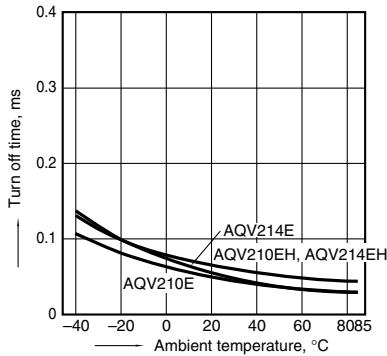
### 3. Turn on time vs. ambient temperature characteristics

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



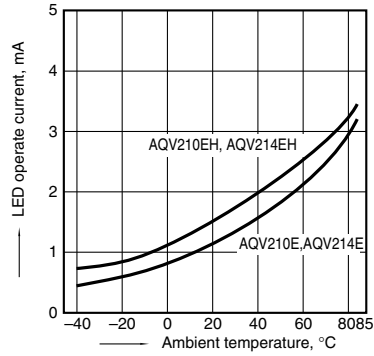
### 4. Turn off time vs. ambient temperature characteristics

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



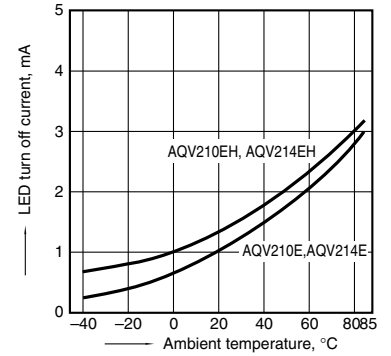
### 5. LED operate current vs. ambient temperature characteristics

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



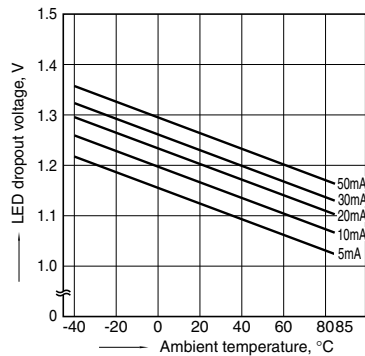
### 6. LED turn off current vs. ambient temperature characteristics

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



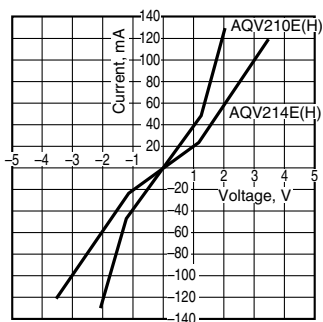
### 7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types  
 LED current: 5 to 50 mA



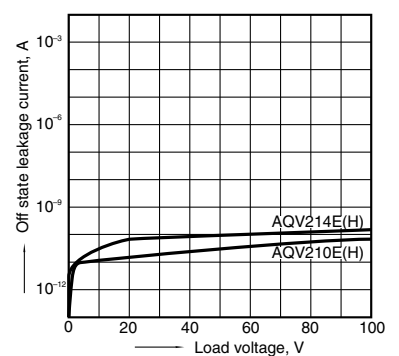
### 8. Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 4 and 6;  
 Ambient temperature:  $25^{\circ}\text{C}$   $77^{\circ}\text{F}$



### 9. Off state leakage current vs. load voltage characteristics

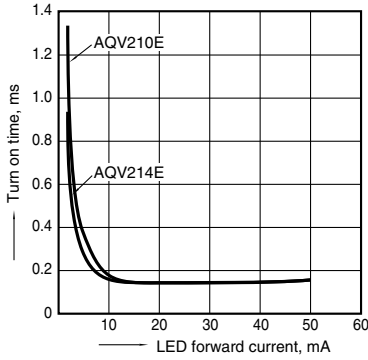
Measured portion: between terminals 4 and 6;  
 Ambient temperature:  $25^{\circ}\text{C}$   $77^{\circ}\text{F}$



# GE 1 Form A (AQV210E, AQV210EH)

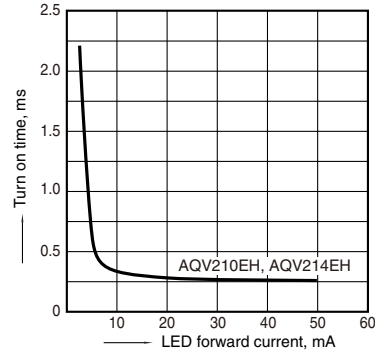
## 10-(1). Turn on time vs. LED forward current characteristics

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



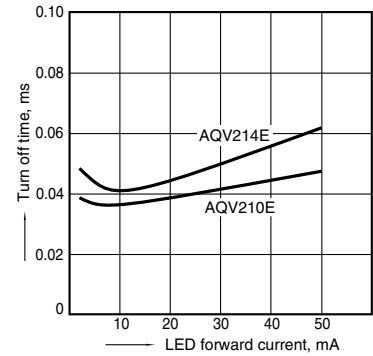
## 10-(2). Turn on time vs. LED forward current characteristics

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



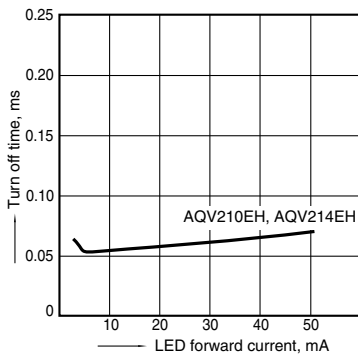
## 11-(1). Turn off time vs. LED forward current characteristics

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



## 11-(2). Turn 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



## 12. Output capacitance vs. applied voltage characteristics

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

