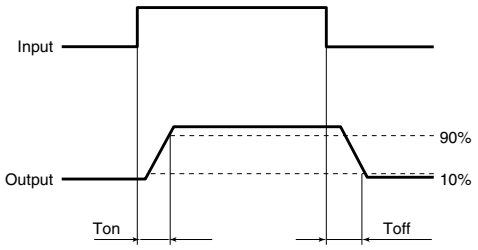
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

| Item | | | Symbol | Type of connection | AQV210E(A) | AQV214E(A) | AQV210EH(A) | AQV214EH(A) | Condition |
|---|---|---|---|---|---|---|---|---|---|
| Input | LED operate current | Typical | $I_{Fon}$ | — | 1.1 mA | | 1.6 mA | | $I_L$ = Max. |
| | | Maximum | | | 3 mA | | | | |
| | LED turn off current | Minimum | $I_{Foff}$ | — | 0.3 mA | | 0.4 mA | | $I_L$ = Max. |
| | | Typical | | | 1.0 mA | | 1.5 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 | 23 Ω | 30 Ω | 23 Ω | 30 Ω | $I_F$ = 5 mA<br>$I_L$ = Max.<br>Within 1 s on time |
| | | Maximum | | | 35 Ω | 50 Ω | 35 Ω | 50 Ω | |
| | | Typical | $R_{on}$ | B | 11.5 Ω | 22.5 Ω | 11.5 Ω | 22.5 Ω | $I_F$ = 5 mA<br>$I_L$ = Max.<br>Within 1 s on time |
| | | Maximum | | | 17.5 Ω | 25 Ω | 17.5 Ω | 25 Ω | |
| | | Typical | $R_{on}$ | C | 6.0 Ω | 11.3 Ω | 6.0 Ω | 11.3 Ω | $I_F$ = 5 mA<br>$I_L$ = Max.<br>Within 1 s on time |
| | | Maximum | | | 8.8 Ω | 12.5 Ω | 8.8 Ω | 12.5 Ω | |
| | Off state leakage current | Maximum | $I_{Leak}$ | — | 1 μA | | | | $I_F$ = 0 mA<br>$V_L$ = Max. |
| Transfer characteristics | Turn on time* | Typical | $T_{on}$ | — | 0.5 ms | | 0.7 ms | | $I_F$ = 5 mA<br>$I_L$ = Max. |
| | | Maximum | | | 2.0 ms | | | | |
| | Turn off time* | Typical | $T_{off}$ | — | 0.05 ms | | | | $I_F$ = 5 mA<br>$I_L$ = Max. |
| | | Maximum | | | 1.0 ms | | | | |
| | I/O capacitance | Typical | $C_{iso}$ | — | 0.8 pF | | | | f = 1 MHz<br>$V_B$ = 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 device operation and resetting.

| Item | Symbol | Recommended value | Unit |
|---|---|---|---|
| Input LED current | $I_F$ | Standard type: 5<br>Reinforced type: 5 to 10 | mA |

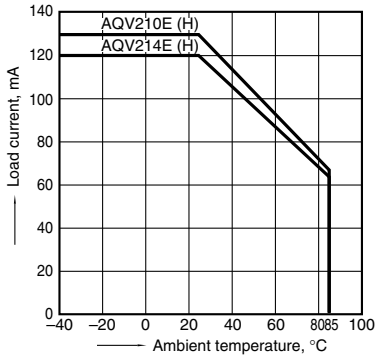
■ **These products are not designed for automotive use.**
**If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.**

# REFERENCE DATA

1. Load current vs. ambient temperature characteristics

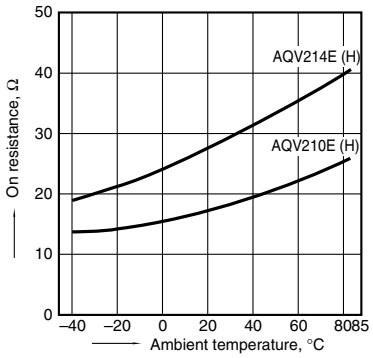
Allowable ambient temperature: –40°C to +85°C
–40°F to +185°F

Type of connection:A



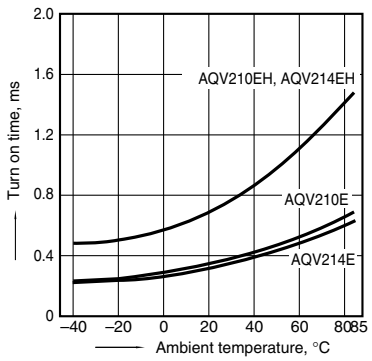

2. On-resistance vs. ambient temperature characteristics

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



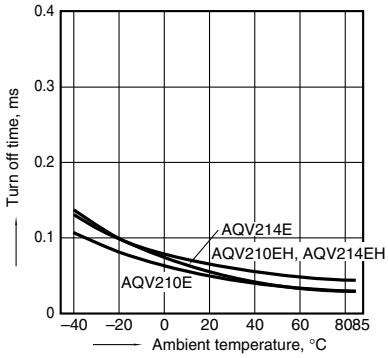

3. Turn on time vs. ambient temperature characteristics

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



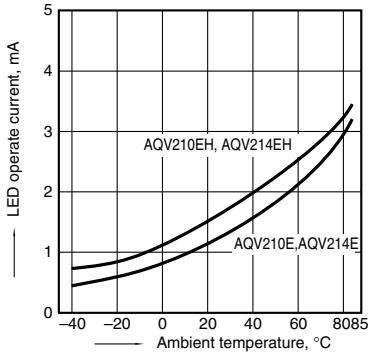

4. Turn off time vs. ambient temperature characteristics

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



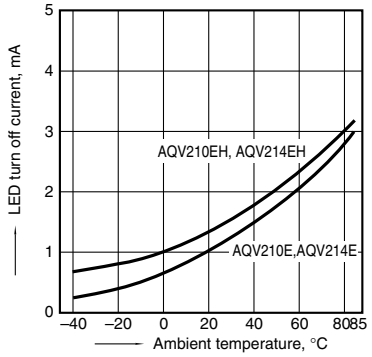

5. LED operate current vs. ambient temperature characteristics

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



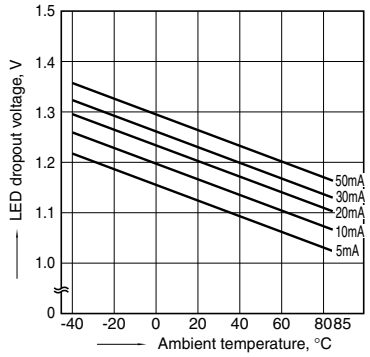

6. LED turn off current vs. ambient temperature characteristics

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



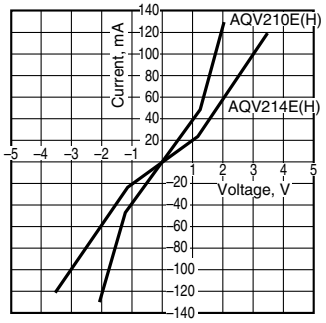

7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types
LED current: 5 to 50 mA



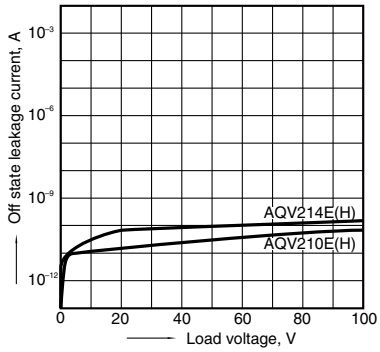

8. Current vs. voltage characteristics of output at MOS portion

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



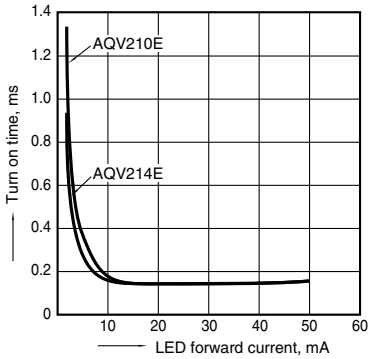

9. Off state leakage current vs. load voltage characteristics

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



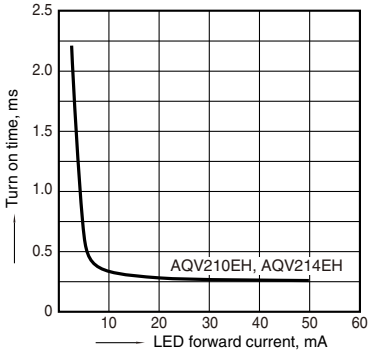
10-(1). Turn on time vs. LED forward current characteristics

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



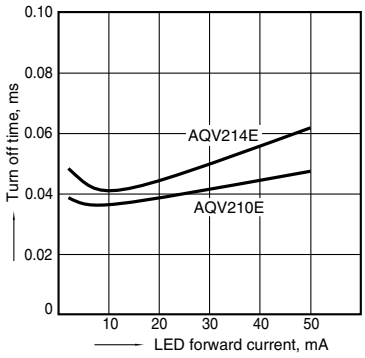

10-(2). Turn on time vs. LED forward current characteristics

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



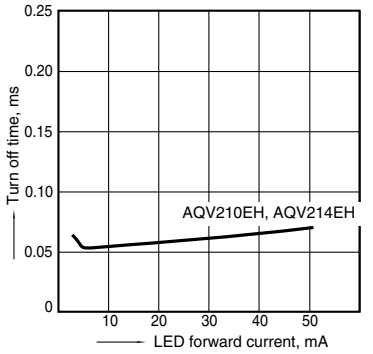

11-(1). Turn off time vs. LED forward current characteristics

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