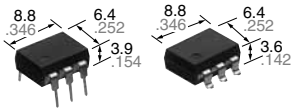
(AQV410EH, 414EH) (AQV412EH)

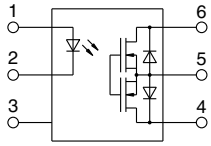
Normally closed type with reinforced insulation

PhotoMOS®
GE 1 Form B
(AQV41○EH)



(Height includes standoff)

mm inch

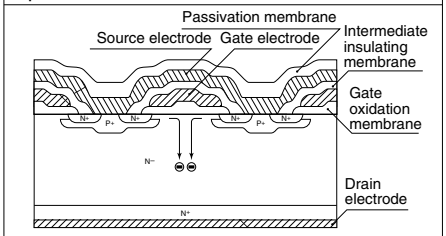


RoHS compliant

FEATURES

1. 1 Form B output type
2. 60V type couples high capacity (0.55A) with low on-resistance (Typ. 1Ω).
3. Low on-resistance
This has been realized thanks to the built-in MOSFET processed by our proprietary method, DSD (Double-diffused and Selective Doping) method.

Cross section of the normally-closed type of power MOS



4. Controls low-level analog signals
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

5. High sensitivity and low on-resistance
Can control max. 0.55 A load current with 5 mA input current.
Low on-resistance of Typ. 1Ω (AQV412EH).
6. Low-level off-state leakage current
7. Reinforced insulation: 5,000 V
More than 0.4 mm internal insulation distance between inputs and outputs.
Conforms to EN41003, EN60950 (reinforced insulation).

TYPICAL APPLICATIONS

- Power supply
- Measuring equipment
- Security equipment
- Telephone equipment
- Sensing equipment

TYPES

	I/O isolation voltage	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	5,000 Vrms (Reinforced)	60 V	550 mA	DIP6-pin	AQV412EH	AQV412EHA	AQV412EHAX	AQV412EHAZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs.
		350 V	130 mA		AQV410EH	AQV410EHA	AQV410EHAX	AQV410EHAZ		
		400 V	120 mA		AQV414EH	AQV414EHA	AQV414EHAX	AQV414EHAZ		

*Indicate the peak AC and DC values.
Note: The surface mount terminal shape indicator “A” and the packing style indicator “X” or “Z” are not marked on the device.

RATING

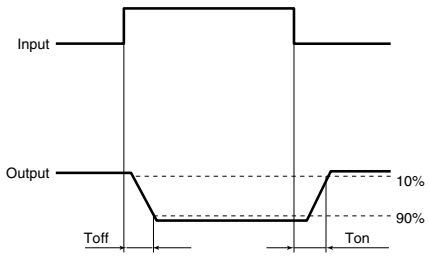
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item		Symbol	Type of connection	AQV412EH(A)	AQV410EH(A)	AQV414EH(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		60 V	350 V	400 V	
	Continuous load current	I_L	A	0.55 A	0.13 A	0.12 A	A connection: Peak AC, DC B,C connection: DC
			B	0.65 A	0.15 A	0.13 A	
			C	0.8 A	0.17 A	0.15 A	
	Peak load current	I_{peak}		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}		5,000 Vrms			
Ambient temperature	Operating	T_{opr}		–40 to +85°C –40 to +185°F			(Non-icing at low temperatures)
	Storage	T_{stg}		–40 to +100°C –40 to +212°F			

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

Item			Symbol	Type of connection	AQV412EH(A)	AQV410EH(A)	AQV414EH(A)	Condition
Input	LED operate (OFF) current	Typical	I_{Foff}	—	1.9 mA			I_L= Max.
		Maximum			3.0 mA			
	LED reverse (ON) current	Minimum	I_{Fon}	—	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	1 Ω	18 Ω	25.2 Ω	I_F = 0 mA I_L = Max. Within 1 s
		Maximum			2.5 Ω	35 Ω	50 Ω	
		Typical	R_{on}	B	0.55 Ω	13 Ω	19 Ω	I_F = 0 mA I_L = Max. Within 1 s
		Maximum			1.3 Ω	17.5 Ω	25 Ω	
		Typical	R_{on}	C	0.3 Ω	6.5 Ω	10 Ω	I_F = 0 mA I_L = Max. Within 1 s
		Maximum			0.7 Ω	8.8 Ω	12.5 Ω	
	Off state leakage current	Maximum	I_{Leak}	—	10 μA			I_F = 5 mA V_L = Max.
Transfer characteristics	Operate (OFF) time*	Typical	T_{off}	—	3 ms	1.5 ms	1.3 ms	I_F = 0 mA → 5 mA I_L = Max.
		Maximum			8 ms	3.0 ms		
	Reverse (ON) time*	Typical	T_{on}	—	0.3 ms			I_F = 5 mA → 0 mA I_L = Max.
		Maximum			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



3. Recommended operating conditions (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

Item		Symbol	Min.	Max.	Unit
LED current		I_F	5	30	mA
AQV412EH(A)	Load voltage (Peak AC)	V_L	—	48	V
	Continuous load current (A connection)	I_L	—	0.55	A
AQV410EH(A)	Load voltage (Peak AC)	V_L	—	280	V
	Continuous load current (A connection)	I_L	—	0.13	A
AQV414EH(A)	Load voltage (Peak AC)	V_L	—	320	V
	Continuous load current (A connection)	I_L	—	0.12	A

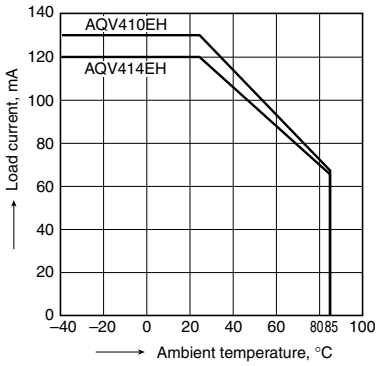
■ **These products are not designed for automotive use.**
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

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

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

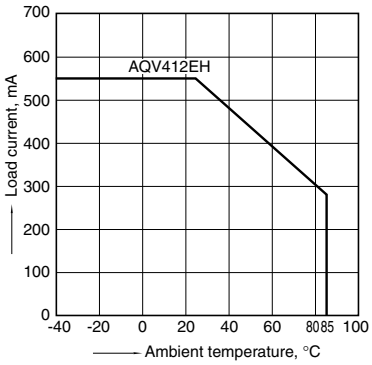
Type of connection: A



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

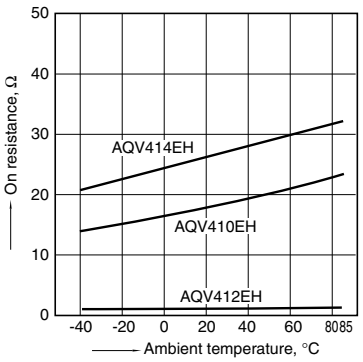
Allowable ambient temperature: –40 to +85°C
–40 to +185°F

Type of connection: A



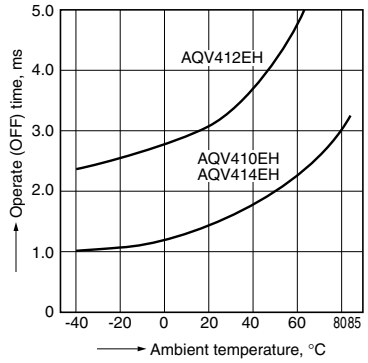
2. On resistance vs. ambient temperature characteristics

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



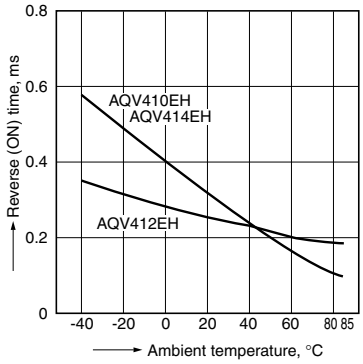
3. Operate (OFF) time vs. ambient temperature characteristics

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



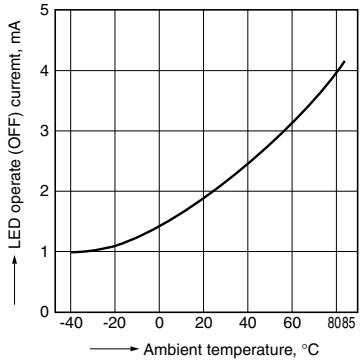
4. Reverse (ON) time vs. ambient temperature characteristics

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



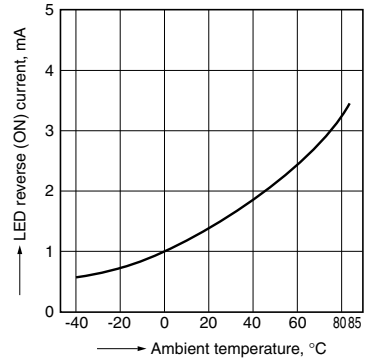
5. LED operate (OFF) current vs. ambient temperature characteristics

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



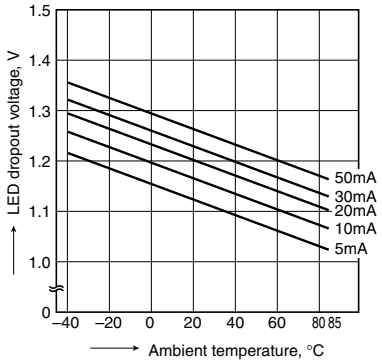
6. LED reverse (ON) current vs. ambient temperature characteristics

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



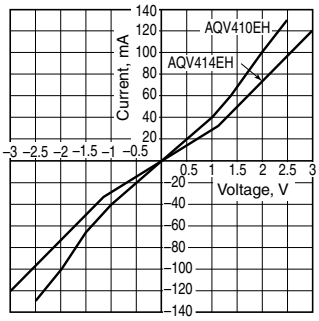
7. LED dropout voltage vs. ambient temperature characteristics

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



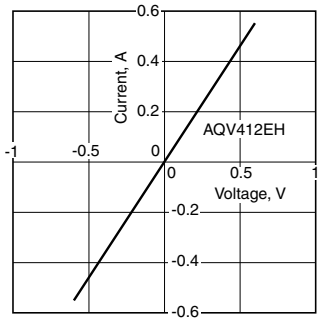
8-(1). Current vs. voltage characteristics of output at MOS portion

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



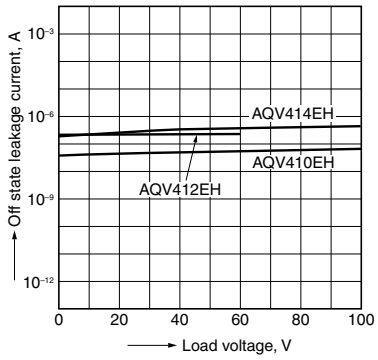
8-(2). Current vs. voltage characteristics of output at MOS portion

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



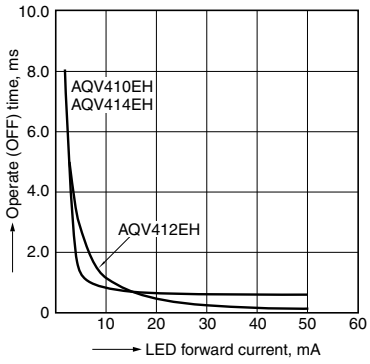
9. Off state leakage current vs. load voltage characteristics

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



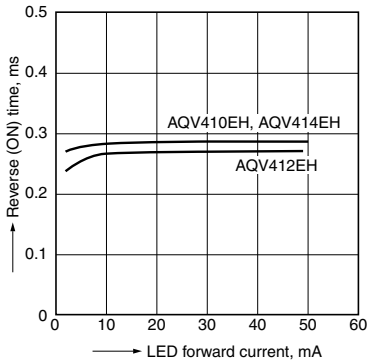
10. Operate (OFF) time vs. LED forward current characteristics

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



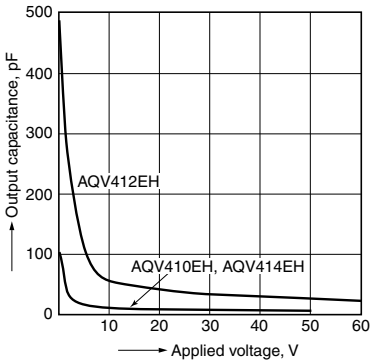
11. Reverse (ON) time vs. LED forward current characteristics

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



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