

RoHS compliant

Most popular types for
Automotive applications

PhotoMOS®

GU 2 Form A
(AQW216HAX○○○)

GU & HE1 Form A
(AQV219HAX○○○, AQV258HAX○○○)

FEATURES

1. Successfully in the market since several years
2. Tested according to AEC-Q101
3. Available for high voltage switching
(1,500V for AQV258HAX○○○)
4. Absolute minimal leakage current (typ.<1nA)
5. Turn on time : Max.0.5ms/1.0ms
Turn off time : Max.0.5ms
6. Input/output isolation up to 5kVrms
7. Linear output characteristics
8. No threshold voltage
9. Stable on-resistance over the entire lifetime
10. Compact housing
11. Highly shock and vibration resistant

Typical Applications in Battery Monitoring Systems (BMS)

1. Isolation Monitoring
2. Battery Monitoring
3. Signal processing

Typical Products for Automotive Applications

Types

Output rating ^{*1}		Package	Contact configuration	Part No. ^{*2}	Packing quantity
Load voltage	Load current				
600 V	40 mA	DIP8pin (SMD)	2 Form A	AQW216HAX○○○	1,000 pcs.
900 V	15 mA	DIP6pin (SMD)	1 Form A	AQV219HAX○○○	
1500 V	20 mA			AQV258HAX○○○	

*1 Indicate the peak AC and DC values.

*2 For other products or applications, please contact us

Absolute maximum ratings (Ambient temperature:25°C)

Item		Symbol	AQW216HAX○○○	AQV219HAX○○○	AQV258HAX○○○	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	600 V	900 V	1500 V	
	Continuous load current	I _L	40 mA (50 mA)	15 mA	20 mA	Peak AC,DC ():in case of using only 1 channel
	Peak load current	I _{peak}	120 mA	45 mA	60 mA	100 ms (1 shot), V _L = DC
	Power dissipation	P _{out}	800 mW	360 mW	360 mW	
Total power dissipation		P _T	850 mW	410 mW	410 mW	
I/O isolation voltage		V _{iso}	Up tp 5000 Vrms			
Ambient temperature	Operating	T _{opr}	-40 to +85°C			(Non-icing at low temperatures)
	Storage	T _{stg}	-40 to +100°C			

* In case of using -40 to 105°C, please contact us

Reference

GU 2 Form A (AQW216HAX_{○○○}), GU & HE1 Form A (AQV219HAX_{○○○}, AQV258HAX_{○○○})

Electric characteristics (Ambient temperature:25°C)

Item		Symbol		Part number			Test conditions
				AQW216HAX _{○○○}	AQV219HAX _{○○○}	AQV258HAX _{○○○}	
Input	LED operate current	I _{Fon}	Typ.	1 mA	0.85 mA	0.8 mA	I _L = Max.
			Max.	3 mA	3 mA	3 mA	
	LED turn off voltage	I _{Foff}	Min.	0.2 mA	0.2 mA	0.2 mA	
			Typ.	0.8 mA	0.8 mA	0.7 mA	
	LED dropout voltage	V _F	Typ.	1.35 V	1.35 V	1.35 V	I _F = 50 mA
			Max.	1.5 V	1.5 V	1.5 V	
Output	On resistance	R _{on}	Typ.	70 Ω	310 Ω	305 Ω	I _F = 10 mA I _L = Max.
			Max.	150 Ω	500 Ω	500 Ω	
	Off state leakage current	I _{Leak}	Max.	1 μA	1 μA	10 μA	I _F = 0 mA, V _L = Max.
Transfer characteristics	Turn on time	T _{on}	Typ.	0.1 ms	0.05 ms	0.15 ms	I _F = 10 mA I _L = Max.
			Max.	0.5 ms	0.5 ms	1 ms	
	Turn off time	T _{off}	Typ.	0.02 ms	0.02 ms	0.04 ms	
			Max.	0.5 ms	0.5 ms	0.5 ms	

* For special electric characteristic requirements, please contact us

Recommended conditions of use (Ambient temperature:25°C)^{*1}

Part number	AQW216HAX _{○○○}	AQV219HAX _{○○○}	AQV258HAX _{○○○}
Continuous load voltage (V _L)	300 V and less	450 V and less	750 V and less
Continuous load current (I _L)	20 mA (25 mA) ^{*2} and less	7.5 mA and less	10 mA and less
LED forward current (I _F)	10 mA	10 mA	10 mA

*1 For other use conditions, please contact us

*2 In case of using only 1 channel

REFERENCE DATA

Typical electric characteristics (Ambient temperature:85°C)

Item		Symbol		Part number			Test conditions
				AQW216HAX _{○○○}	AQV219HAX _{○○○}	AQV258HAX _{○○○}	
Input	LED operate current	I _{Fon}	Typ.	1.5mA	1.6mA	1.5mA	I _L = Max.
	LED turn off voltage	I _{Foff}	Typ.	1.5mA	1.6mA	1.4mA	
	LED dropout voltage	V _F	Typ.	1.28V	1.28V	1.28V	I _F = 50mA
Output	On resistance	R _{on}	Typ.	100Ω	420Ω	470Ω	I _F = 10mA, I _L = Max.
Transfer characteristics	Turn on time	T _{on}	Typ.	0.1ms	0.1ms	0.2ms	I _F = 10mA I _L = Max.
	Turn off time	T _{off}	Typ.	0.02ms	0.02ms	0.04ms	

PhotoMOS[®] for Automotive Applications

Before Selecting PhotoMOS[®] for Automotive Applications

Some changes in specification parameters are needed when PhotoMOS[®] are used in certain automotive applications. Automotive grade PhotoMOS[®] are

generally used in automotive environment since stricter enhanced quality controls are needed. The user is cautioned and asked to

inquire with a Panasonic Corporation local sales representative before designing the products in such environments.

About Specification Reviews

Automotive applications require specification reviews. This is important and necessary in order to prevent performance, quality and reliability problems. The following parameters should be reviewed with a Panasonic Corporation local sales representative:

- Targeted application
- Targeted levels of quality and reliability
- Circuits description of load level, driving methods, etc.
- Service conditions
- Influence at failure and failsafe concepts, etc.

About Derating Design

Derating is essential in any reliable design and a significant factor in consideration of product life. Sufficient derating is needed against maximum rating when designing a system. It is recommended using a derated voltage of 50% (or less) of absolute maximum load voltage rating, and 50% (or less) of absolute maximum load cur-

rent ratings.

Devices should be examined using a measurement equipment.

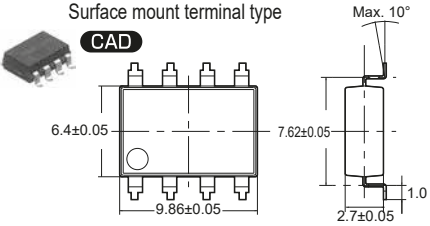
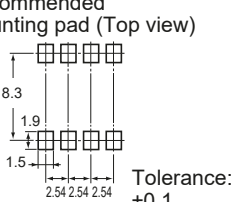
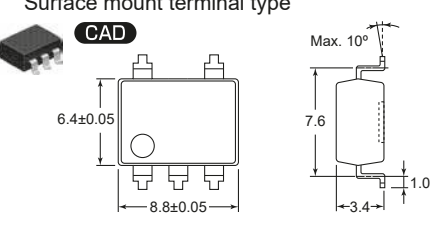
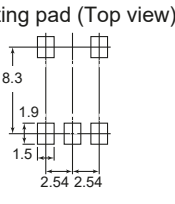
Derated voltages must be considered according to operating and environmental conditions the device will be subjected to.

In case of automotive applications, more allowance should be given to

maximum ratings and installation of safety measures (i.e. use of double circuits).

Misuse of the products listed in this document shall be made at the users' own risk.

PhotoMOS® Dimensions

Type	Dimensions
AQW216HAX○○○	<p>Surface mount terminal type</p>  <p>Recommended mounting pad (Top view)</p>  <p>Terminal thickness = 0.2 General tolerance: ±0.1</p>
AQV219HAX○○○ AQV258HAX○○○	<p>Surface mount terminal type</p>  <p>Recommended mounting pad (Top view)</p>  <p>Terminal thickness = 0.25 General tolerance: ±0.1</p>

Package format

Tape and reel

		mm
	Tape dimensions	Dimensions of tape reel
DIP 8-pin Surface mount terminal		
DIP 6-pin Surface mount terminal		

CAUTIONS FOR USE

For cautions for general use, please read "PhotoMOS® Cautions for Use" at Automation Control WEB site (as described in footer of catalog)

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