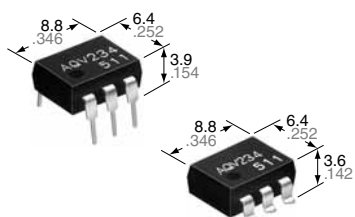


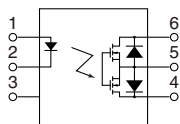


**DIP6-pin type  
featuring high sensitivity**

**PhotoMOS<sup>®</sup>  
HS 1 Form A  
(AQV234)**



mm inch



**RoHS compliant**

### FEATURES

- High sensitivity**  
LED operate current: 0.31mA (typ.)  
Recommended LED input current: 2mA
- Low-level off state leakage current of max. 1  $\mu$ A**
- Controls low-level analog signals**  
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

### TYPICAL APPLICATIONS

- High-speed inspection machines**  
Scanner, IC checker, Board tester, etc.
- Telephone and data communication equipment**

### TYPES

	Output rating*		Package	Part No.				Packing quantity	
				Through hole terminal	Surface-mount terminal			Tube	Tape and reel
	Load voltage	Load current			Tube packing style		Tape and reel packing style		
			Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side					
AC/DC dual use	400 V	120 mA	DIP6-pin	AQV234	AQV234A	AQV234AX	AQV234AZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs.

\*Indicate the peak AC and DC values.

Note: The surface mount terminal 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)

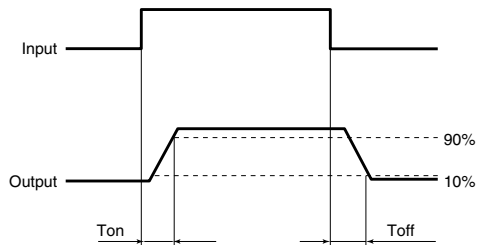
Item		Symbol	Type of connection	AQV234(A)	Remarks
Input	LED forward current	$I_F$		50 mA	
	LED reverse voltage	$V_R$		5 V	
	Peak forward current	$I_{FP}$		1 A	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	$P_{in}$		75 mW	
Load voltage (Peak AC)		$V_L$		400 V	
Output	Continuous load current	$I_L$	A	0.12 A	A connection: Peak AC, DC B, C connection: DC
			B	0.13 A	
			C	0.15 A	
Peak load current		$I_{peak}$		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	
Temperature limits	Operating	$T_{opr}$		-40°C to +85°C -40°F to +185°F	Non-condensing at low temperature
	Storage	$T_{stg}$		-40°C to +100°C -40°F to +212°F	

# HS 1 Form A (AQV234)

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

Item		Symbol	Type of connection	AQV234(A)	Remarks	
Input	LED operate current	Typical	I <sub>Fon</sub>	—	0.31 mA	$\Delta I_F/\Delta t \geq 100 \mu\text{A/s}$ I <sub>L</sub> = Max.
		Maximum			0.5 mA	
	LED turn off current	Minimum	I <sub>Foff</sub>	—	0.1 mA	$\Delta I_F/\Delta t \geq 100 \mu\text{A/s}$ I <sub>L</sub> = Max.
		Typical			0.29 mA	
LED dropout voltage	Typical	V <sub>F</sub>	—	1.25 V (1.1 V at I <sub>F</sub> = 2 mA)		
	Maximum			1.5 V	I <sub>F</sub> = 50 mA	
Output	On resistance	Typical	R <sub>on</sub>	A	30 Ω	I <sub>F</sub> = 2 mA, I <sub>L</sub> = Max. Within 1 s on time
		Maximum			50 Ω	
		Typical	R <sub>on</sub>	B	22.5 Ω	
		Maximum			25 Ω	
	Typical	R <sub>on</sub>	C	11.3 Ω	I <sub>F</sub> = 2 mA, I <sub>L</sub> = Max. Within 1 s on time	
	Maximum			12.5 Ω		
Off state leakage current	Maximum	I <sub>Leak</sub>	—	1 μA	I <sub>F</sub> = 0 mA, V <sub>L</sub> = Max.	
Transistor characteristics	Turn on time*	Typical	T <sub>on</sub>	—	0.89 ms	I <sub>F</sub> = 2 mA I <sub>L</sub> = Max.
		Maximum			2 ms	
	Turn off time*	Typical	T <sub>off</sub>	—	0.22 ms	I <sub>F</sub> = 2 mA I <sub>L</sub> = Max.
		Maximum			1 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				
Initial I/O isolation resistance	Minimum	R <sub>iso</sub>	—	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 <sub>F</sub>	2	mA

■ These products are not designed for automotive use.

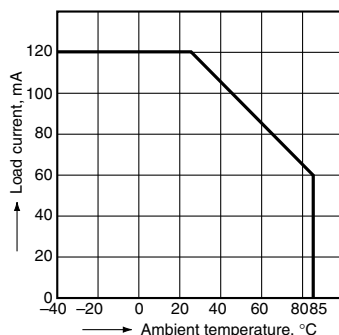
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

## REFERENCE DATA

1. Load current vs. ambient temperature characteristics

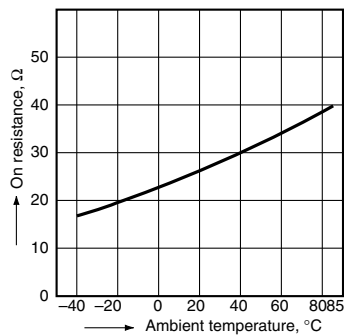
Allowable ambient temperature: -40°C to +85°C  
-40°F to +185°F

Type of connection: A



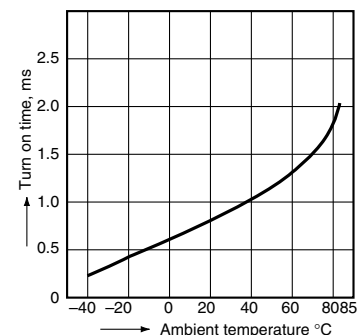
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;  
LED current: 2 mA; Load voltage: 400 V (DC);  
Continuous load current: 120 mA (DC)



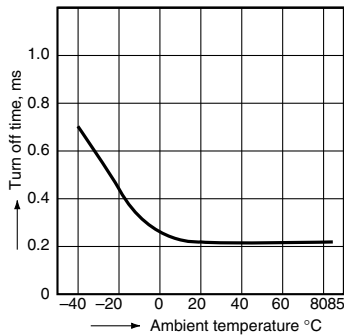
3. Turn on time vs. ambient temperature characteristics

LED current: 2 mA;  
Load voltage: 400 V (DC);  
Continuous load current: 120 mA (DC)



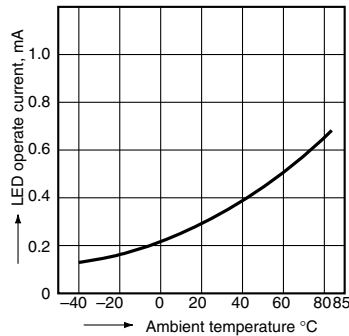
4. Turn off time vs. ambient temperature characteristics

LED current: 2 mA; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



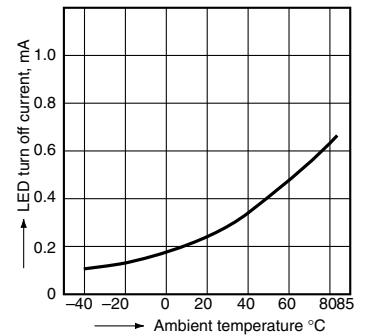
5. LED operate current vs. ambient temperature characteristics

Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



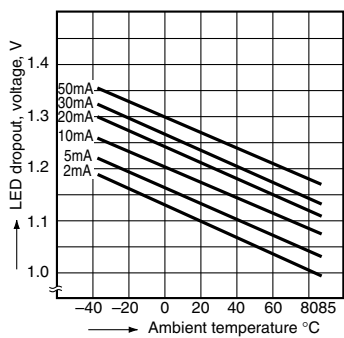
6. LED turn off current vs. ambient temperature characteristics

Load voltage: 400 V (DC); Continuous load current: 120 mA (DC)



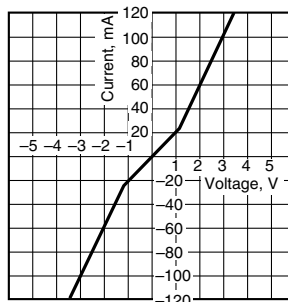
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 2 to 50 mA



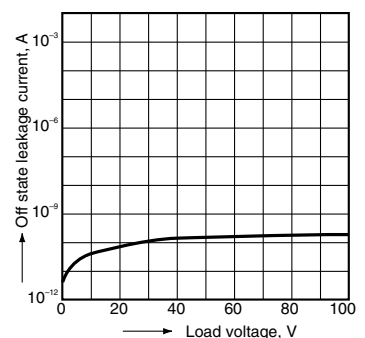
8. Current vs. voltage characteristics of output at MOS portion

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



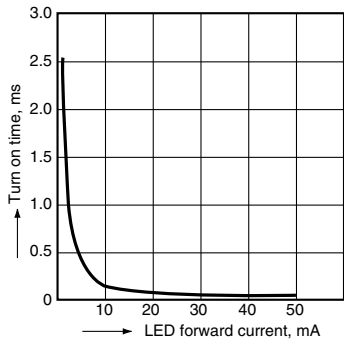
9. Off state leakage current vs. load voltage characteristics

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



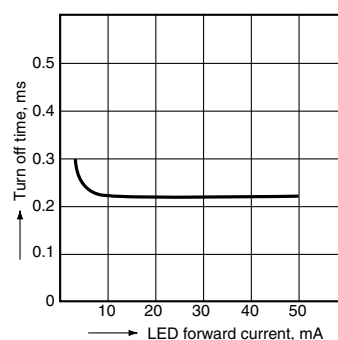
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6; Load voltage: 400 V (DC); Continuous load current: 120 mA (DC); Ambient temperature: 25°C 77°F



11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6; Load voltage: 400 V (DC); Continuous load current: 120 mA (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

