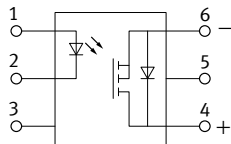
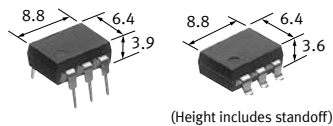


GU 1 Form A Short Circuit Protection non-latch type

Short circuit protection (Non-latch type) only for DC load



(Unit: mm)

FEATURES

- Protects Circuit from excess current
- No need for fuses, poly switches, or other protectors
- High capacity
Can control up to 0.5A (60V DC) load current.

TYPICAL APPLICATIONS

- Industrial equipment
- Security equipment

Note: Please contact our sales representative for automotive applications of PhotoMOS.

TYPES

Category	Output rating*1		Part No.				Packing quantity	
	Load voltage	Load current	Through hole terminal	Surface mount terminal			Tube	Tape and reel
			Tube packing style	Tape and reel packing style X*2	Tape and reel packing style Z*2			
DC only	60 V	500 mA	AQV112KL	AQV112KLA	AQV112KLAX	AQV112KLAZ	1-tube: 50 pcs. Outer carton: 500 pcs.	1-reel: 1,000 pcs. Outer carton: 1,000 pcs.

Note: The surface mount terminal shape indicator "A" and the packing style indicator "X" or "Z" are not marked on the device. (Ex. the label for product number AQV112KLAX is AQV112KL.)

*1. Indicate the DC values.

*2. Tape and reel packing style X: picked from the 1/2/3-pin side, tape and reel packing style Z: picked from the 4/5/6-pin side.

RATING

Absolute maximum ratings (Ambient temperature: 25°C)

Item		Symbol	AQV112KL (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 Ratio = 0.1%
	Power dissipation	P_{in}	75 mW	
Output	Load voltage (peak AC)	V_L	7 to 60V	
	Continuous load current	I_L	0.5 A	Peak AC, DC
	Power dissipation	P_{out}	500 mW	
Total power dissipation		P_T	550 mW	
I/O isolation voltage		V_{iso}	1,500 Vrms	
Ambient temperature (Operating)		T_{opr}	-40 to +85°C	(Avoid icing and condensation)
Ambient temperature (Storage)		T_{stg}	-40 to +100°C	

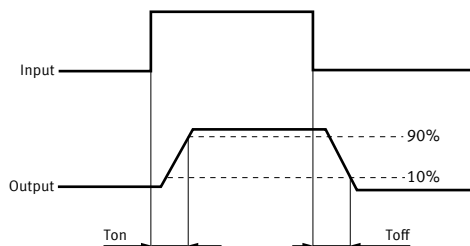
PhotoMOS GU 1 Form A Short Circuit Protection

■ Electrical characteristics (Ambient temperature: 25°C)

Item		Symbol	AQV112KL (A)	Condition	
Input	LED operate current	Typical	0.8 mA	$I_L = 100 \text{ mA}$	
		Maximum	10 mA		
	LED turn off current	Minimum	0.3 mA	$I_L = 100 \text{ mA}$	
		Typical	0.7 mA		
LED dropout voltage	Typical	1.35 V (1.17 V at $I_F = 10 \text{ mA}$)		$I_F = 50 \text{ mA}$	
	Maximum	1.5 V			
Output	On resistance	Typical	0.55 Ω	$I_F = 10 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s	
		Maximum	2.0 Ω		
	Load short circuit detection voltage*1	Typical	5 V	$I_F = 10 \text{ mA}$	
		Maximum	7 V		
Off state leakage current	Maximum	I_{Leak}	1 μA	$I_F = 0 \text{ mA}$ $V_L = \text{Max.}$	
Transfer characteristics	Turn on time*2	Typical	T_{on}	2.0 ms	$I_F = 10 \text{ mA}$ $I_L = 100 \text{ mA}$ $V_L = 10 \text{ V}$
		Maximum		5.0 ms	
	Turn off time*2	Typical	T_{off}	0.1 ms	$I_F = 10 \text{ mA}$ $I_L = 100 \text{ mA}$ $V_L = 10 \text{ V}$
		Maximum		1.0 ms	
	I/O capacitance	Typical	C_{iso}	0.8 pF	$f = 1 \text{ MHz}$ $V_B = 0 \text{ V}$
		Maximum		1.5 pF	
Initial I/O isolation resistance	Minimum	R_{iso}	1,000 M Ω	500 V DC	

*1. At $I_F = 10 \text{ mA}$, load current will be oscillated if the voltage between 4 (+) -6 (-) terminals becomes more than the detection voltage of the short circuit.

*2. Turn on/Turn off time



■ Recommended operating conditions (Ambient temperature: 25°C)

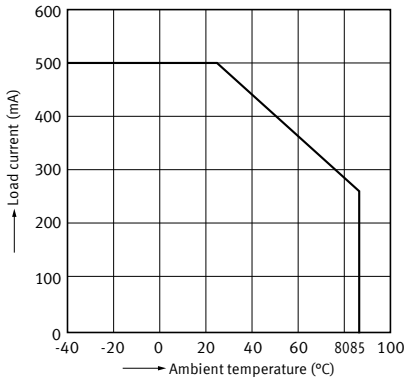
Please use under recommended operating conditions to obtain expected characteristics.

Item	Symbol	Min.	Max.	Unit
LED current	I_F	10	30	mA
AQV112KL (A) Load voltage (DC)	V_L	10	48	V
Continuous load current (DC)	I_L	-	0.5	A

REFERENCE DATA

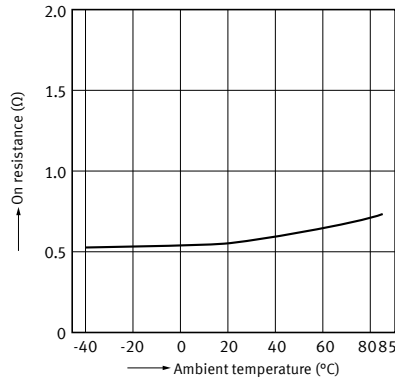
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40 to +85°C



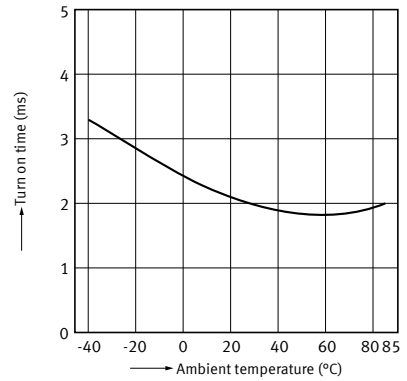
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 10 mA; Load current: Max. (DC)



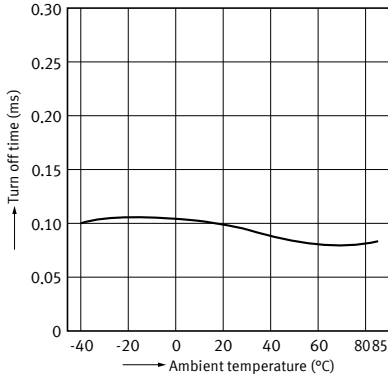
3. Turn on time vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 10 mA; Load voltage: 10 V (DC);
Load current: 100 mA



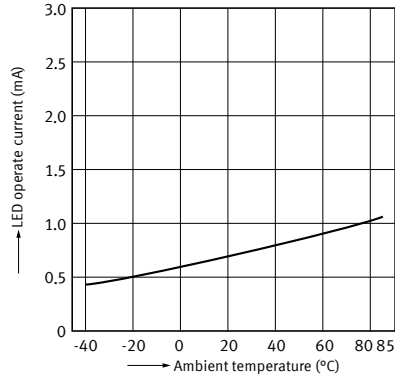
4. Turn off time vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 10 mA; Load voltage: 10 V (DC);
Load current: 100 mA (DC)



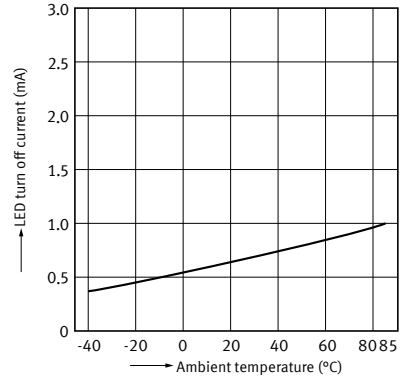
5. LED operate current vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
Load current: 100 mA



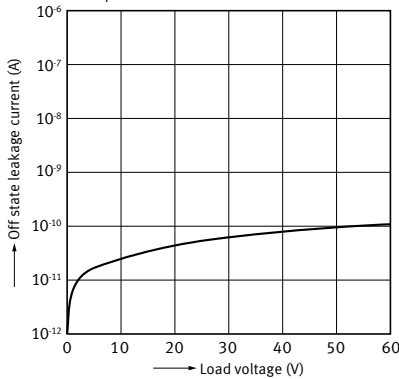
6. LED turn off current vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
Load current: 100 mA



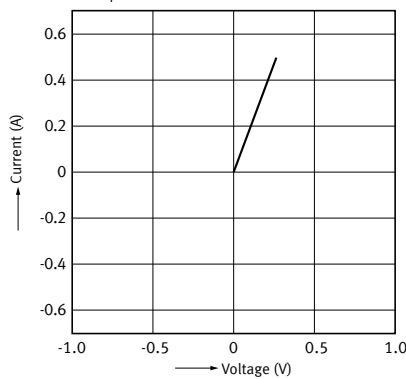
7. Off state leakage current vs. load voltage characteristics

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



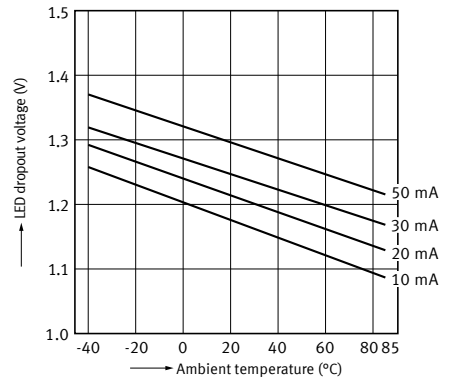
8. Current vs. voltage characteristics of output at MOS portion

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



9. LED dropout voltage vs. ambient temperature characteristics

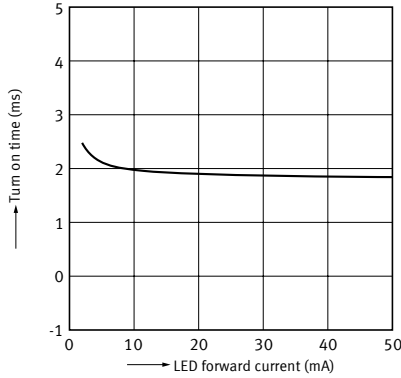
Measured portion: between terminals 1 and 2;
LED current: 10 to 50 mA



PhotoMOS GU 1 Form A Short Circuit Protection

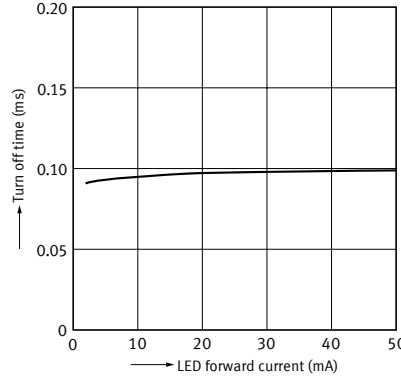
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
Load voltage: 10 V (DC); Load current: 100 mA (DC);
Ambient temperature: 25°C



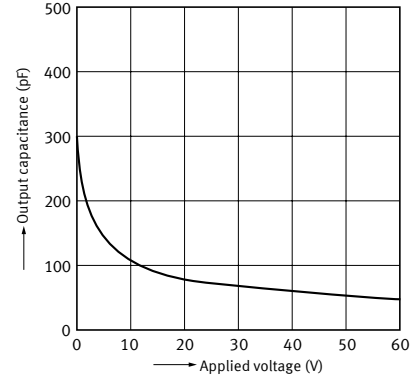
11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
Load voltage: 10 V (DC); Load current: 100 mA (DC);
Ambient temperature: 25°C



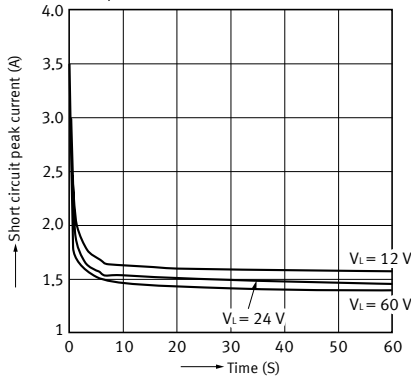
12. Output capacitance vs. applied voltage characteristics

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



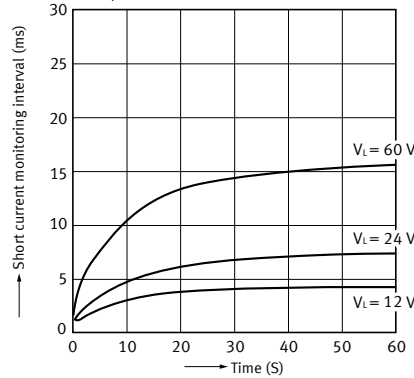
13. Short circuit peak current vs. time characteristics

Measured portion: between terminals 4 and 6;
LED current: 10 mA; Load resistance: 0 Ω;
Ambient temperature: 25°C



14. Short current monitoring interval vs. time characteristics

Measured portion: between terminals 4 and 6;
LED current: 10 mA; Load resistance: 0 Ω;
Ambient temperature: 25°C

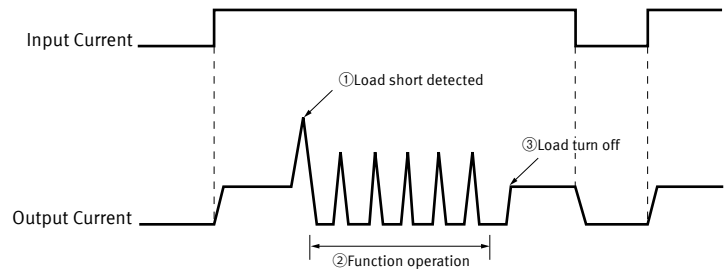


What is short circuit protection Non-latch type?

If the load current reaches a predetermined overcurrent level, the output-side short circuit protection function cuts off the load current. It then monitors the load current, and if it returns to normal, automatically recovers to normal device operation.

In order to operate the short circuit protection function, ensure that the input current is at least $I_F = 10$ mA.

● Operation chart (Non-latch type)



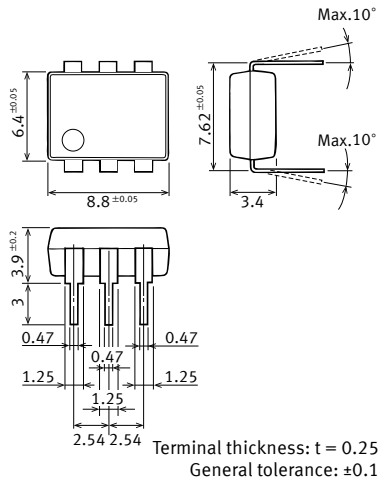
DIMENSIONS

CAD The CAD data of the products with a "CAD" mark can be downloaded from our Website.

Unit: mm

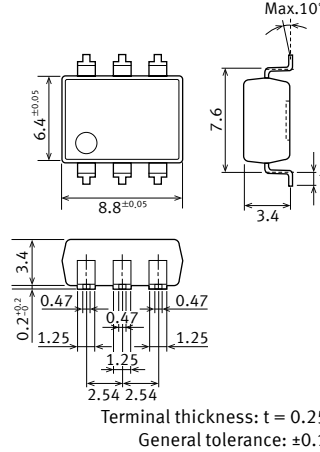
CAD

Through hole terminal type
External dimensions

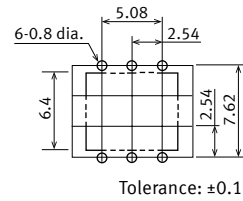


CAD

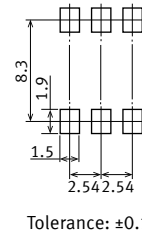
Surface mount terminal type
External dimensions



PC board pattern
(Bottom view)



Recommended mounting pad
(Top view)



SCHEMATIC AND WIRING DIAGRAMS

Schematic	Output configuration	Load type	Connection	Wiring diagram
<p>*</p>	1 Form A	DC	A	

*Terminal 3 cannot be used, since it is in the internal circuit of the device.

SAFETY STANDARDS

Part No.	UL (Recognized)		CSA (Certified)		Remarks
	File No. (Standard No.)	Contact rating	File No. (Standard No.)	Contact rating	
AC/DC dual use AQV112KL (A)	E191218 (UL1577)	0.5A 60V DC	(Certified by C-UL)		VDE approved (Nr. 40051981)

Note: For the latest information on compliance with safety standards, please refer to our website.

Please refer to **"the latest product specifications"** when designing your product.
 •Requests to customers:
<https://industrial.panasonic.com/ac/e/salespolicies/>

Please contact

Panasonic Corporation

Electromechanical Control Business Division

■1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan
industrial.panasonic.com/ac/e/

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