

GU (General Use) Type 1-Channel (Form A) Current Limit Function 6-Pin Type

8.8±0.05 .346±.002 .3.6±0.2 .1.42±.008 8.8±0.05 .3.46±.002 .252±.002 .3.6±0.2 .1.42±.008 8.8±0.05 .252±.002 .252±.002 .252±.002 .154±.008



FEATURES 1. Current Limit Function

To control an over current from flowing, the current limit function has been realized. It keeps an output current at a constant value when the current reaches a specified current limit value.

2. Enhancing the capability of surge resistance between output terminals

The current limit function controls the ON time surge current to enhance the capability of surge resistance between output terminals.

3. Reinforced insulation 5,000 V type More than 0.4 mm internal insulation distance between inputs and outputs. Conforms to EN41003, EN60950 (reinforced insulation).

PhotoMOS RELAYS

4. Compact 6-pin DIP size

The device comes in a compact (W)6.4 \times (L)8.8 \times (H) 3.9mm (W).252 \times (L).346 \times (H).154inch, 6-pin DIP size

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

6. High sensitivity, low ON resistance

7. Low-level off state leakage current

TYPICAL APPLICATIONS

• Telephone equipment

Modem

TYPES

	-0								
				Part No.					
Turco	I/O isolation	Output	rating*	Through hole terminal	Surface-mount terminal			Packing	quantity
Туре	voltage		d Load			Tape and reel packing style			
		Load voltage	current	Tube pac	king style	Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side	Tube	Tape and reel
AC/DC type	Reinforced 5,000 V	350 V	130 mA	AQV210HL	AQV210HLA	AQV210HLAX	AQV210HLAZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs.

*Indicate the peak AC and DC values.

Note: For space reasons, the package type indicator "X" and "Z" are omitted from the seal.

mm inch

RATING

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

	Item	Symbol	AQV210HL(A)	Remarks
	LED forward current	lF	50 mA	
Input	LED reverse voltage	Vr	3 V	
	Peak forward current	IFP	1 A	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	Pin	75 mW	
	Load voltage (peak AC)	VL	350 V	
Output	Continuous load current	١L	0.13 A	
	Power dissipation	Pout	500 mW	
Total po	wer dissipation	Ρτ	550 mW	
I/O isolatiom voltage		Viso	5,000 V AC	
Tempera	ature Operating	Topr	-40°C to +85°C -40°F to +185°F	Non-condensing at low temperatures
limits	Storage	Tstg	-40°C to +100°C -40°F to +212°F	

AQV210HL

Item			Symbol	AQV210HL(A)	Condition	
	LED operate	Typical	1_	1.6 mA	IL = Max.	
	current	Maximum	IFon	3.0 mA		
Innut	LED turn off	Minimum	Foff	0.4 mA	IL = Max.	
Input	current	Typical	IFoff	1.5 mA		
	LED dropout	Minimum	VF	1.14 (1.25 V at I⊧ = 50mA)	I⊧ = 5 mA	
	voltage	Typical	VF	1.5 V		
	On maintaine	Typical	Ron	20Ω	I⊧ = 5 mA I∟ = Max. Within 1 s on time	
_	On resistance	Maximum		25Ω		
Output	Off state leakage current	Maximum	Leak	1μΑ	IF = 0 V∟ = Max.	
	Current limit	Typical	—	180 mA	IF = 5 mA	
	Turn on time*	Typical	-	0.8 ms	IF = 5 mA I∟ = Max.	
	rum on time	Maximum	Ton	2.0 ms		
	Turn off time*	Typical	Toff	0.05 ms	I⊧ = 5 mA I∟ = Max.	
Transfer	rum on ume	Maximum	I off	1.0 ms		
characteristics	I/O capacitance	Typical	Ciso	0.8 pF	f = 1 MHz	
		Maximum	Ciso	1.5 pF	V _B = 0	
	Initial I/O isolation resistance	Minimum	Riso	1,000 MΩ	500 V DC	

Note: Recommendable LED forward current I_{F} = 5 to 10 mA.

For type of connection, see Page 31.

*Turn on/Turn off time



REFERENCE DATA

1. Load current vs. ambient temperature characteristics

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



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)



AQV210HL

4. Turn off time vs. ambient temperature characteristics

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



7. LED dropout voltage vs. ambient temperature characteristics LED current: 5 to 50 mA

1.5 LED dropout voltage, V 1.4 1.3 1.2 50m/ 30mA 1.1 20mA 10mA 5mA 1.0 0 40 -20 0 20 40 60 80 85 Ambient temperature, °C

10. LED forward current vs. turn on time characteristics

Measured portion: between terminals 4 and 6; Load voltage: Max.(DC); Continuous load current: Max.(DC); Ambient temperature: $25^{\circ}C$ $77^{\circ}F$



What is current limit

When a load current reaches the specified output control current, a current limit function works against the load current to keep the current a constant value. The current limit circuit built into the PhotoMOS relay thus controls the instantaneous load current to effectively ensure circuit safety.

This safety feature protects circuits down-

5. LED operate current vs. ambient temperature characteristics

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



8. Voltage vs. current characteristics of output at MOS portion

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



11. LED forward current vs. turn off time char-

Measured portion: between terminals 4 and 6;

Max (DC); Ambient temperature: 25°C 77°F

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

acteristics

0.2

≌ 0.15

0.1

0.05

0

ō

10 20 30 40 50 60

Turn off time,

6. LED turn off current vs. ambient temperature characteristics

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



9. Off state leakage current Measured portion: between terminals 4 and 6; Ambient temperature: $25^{\circ}C$ $77^{\circ}F$



12. Applied voltage vs. output capacitance characteristics

Measured portion: between terminals 4 and 6; Frequency: 1 MHz; Ambient temperature: 25°C 77°F



stream of the PhotoMOS relay against over-current.

LED forward current, mA

But, if the current-limiting feature is used longer than the specified time, the Photo-MOS relay can be destroyed. Therefore, set the output loss to the max. rate or less. • Comparison of output voltage and output current characteristics

V-I Characteristics

