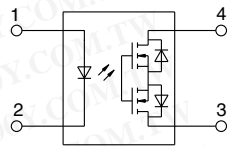
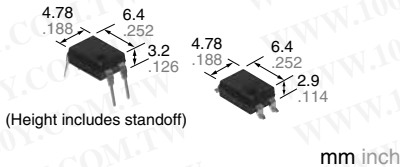




勝特力材料 886-3-5753170
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**DIP4-pin type with
 current limiting and
 reinforced insulation**

**PhotoMOS®
 GU 1 Form A
 Current Limiting (AQY210HL)**



RoHS compliant

FEATURES

- 1. Current Limiting 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. Enhances 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 of 5,000 Vrms**
 More than 0.4 mm internal insulation distance between inputs and outputs. Con-forms to EN41003, EN60950 (reinforced insulation).

- 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**
- 6. Low-level off state leakage current**

TYPICAL APPLICATIONS

- Telephone equipment
- Modem

TYPES

	I/O isolation voltage	Output rating*		Package	Part No.				Packing quantity	
		Load voltage	Load current		Through hole terminal	Surface-mount terminal		Tube	Tape and reel	
						Tape and reel packing style				
AC/DC dual use	Reinforced 5,000 Vrms	350 V	120 mA	DIP4-pin	Tube packing style	Picked from the 1/2-pin side	Picked from the 3/4-pin side	1 tube contains: 100 pcs. 1 batch contains: 1,000 pcs.	1,000 pcs.	
					AQY210HL	AQY210HLA	AQY210HLAX	AQY210HLAZ		

*Indicate the peak AC and DC values.

Note: For space reasons, only "210HL" is marked on the product. The three initial letters of the part number "AQY", 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)

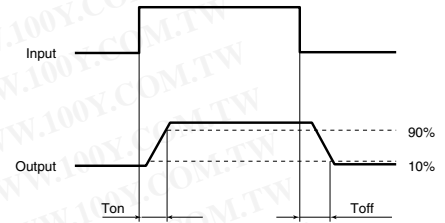
Item	Symbol	AQY210HL(A)		Remarks
Input	LED forward current	I_F	50 mA	
	LED reverse voltage	V_R	5 V	
	Peak forward current	I_{FP}	1 A	f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW	
Output	Load voltage (peak AC)	V_L	350 V	
	Continuous load current	I_L	0.12 A	Peak AC, DC
	Power dissipation	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	

GU 1 Form A Current Limiting (AQY210HL)

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

Item		Symbol	AQY210HL(A)	Condition
Input	LED operate current	Typical	1.2 mA	I _L = Max.
		Maximum	3.0 mA	
	LED turn off current	Minimum	0.4 mA	I _L = Max.
		Typical	1.1 mA	
LED dropout voltage	Minimum	1.25 (1.14 V at I _F = 5 mA)		I _F = 50 mA
	Typical	1.5 V		
Output	On resistance	Typical	20Ω	I _F = 5 mA I _L = Max. Within 1 s
		Maximum	25Ω	
	Off state leakage current	Maximum	I _{Leak}	1μA
Current limit	Typical	—	0.18 A	I _F = 5 mA
Transfer characteristics	Turn on time*	Typical	0.5 ms	I _F = 5 mA I _L = Max.
		Maximum	2.0 ms	
	Turn off time*	Typical	0.08 ms	I _F = 5 mA I _L = Max.
		Maximum	1.0 ms	
	I/O capacitance	Typical	C _{iso}	0.8 pF
Maximum			1.5 pF	
Initial I/O isolation resistance	Minimum	R _{iso}	1,000 MΩ	500 V DC

*Turn on/Turn off 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
AQY210HL(A)	Load voltage (Peak AC)	—	280	V
	Continuous load current	I _L	0.12	A

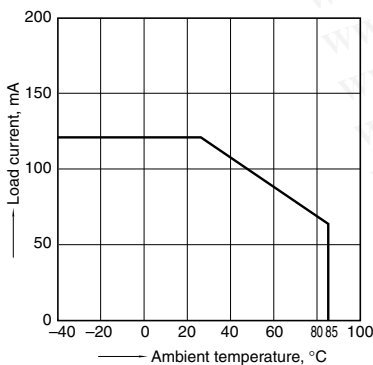
■ These products are not designed for automotive use.

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

REFERENCE DATA

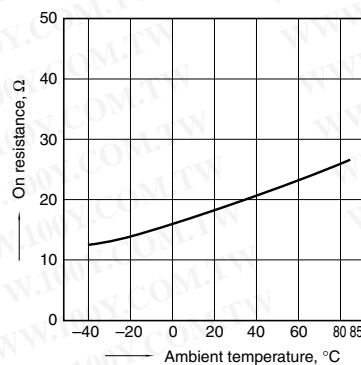
1. Load current vs. ambient temperature characteristics

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



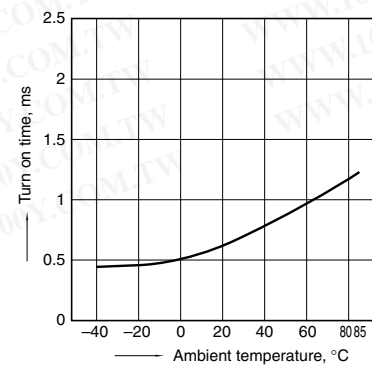
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4;
LED current: 5 mA; Load voltage: Max. (DC)
Continuous load current: Max. (DC)



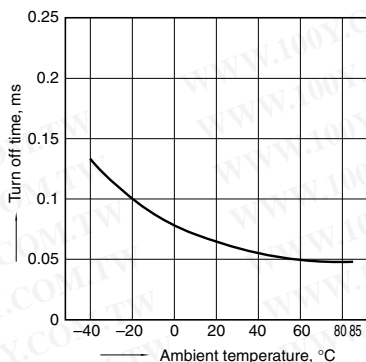
3. Turn on time vs. ambient temperature characteristics

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



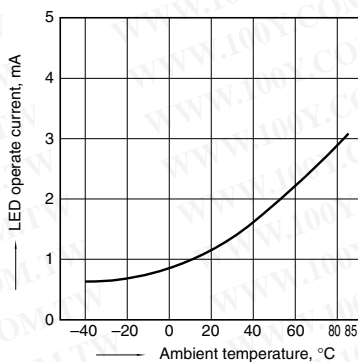
4. Turn off time vs. ambient temperature characteristics

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



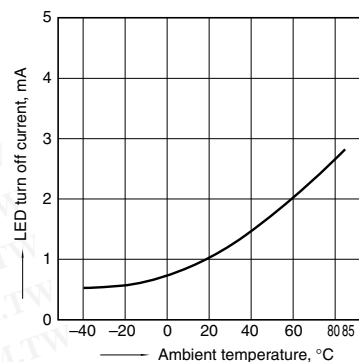
5. LED operate current vs. ambient temperature characteristics

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



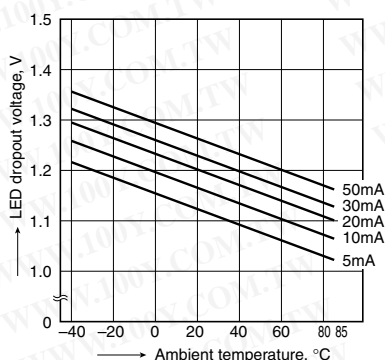
6. LED turn off current vs. ambient temperature characteristics

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



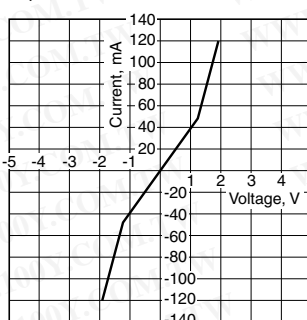
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



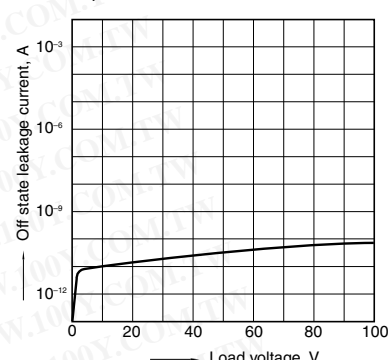
8. Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 3 and 4; Ambient temperature: 25°C 77°F



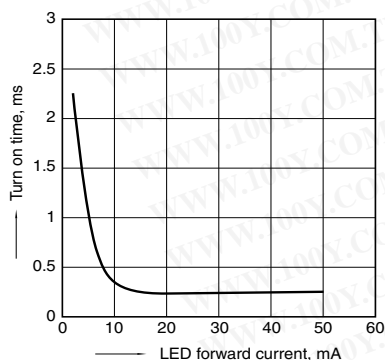
9. Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4; Ambient temperature: 25°C 77°F



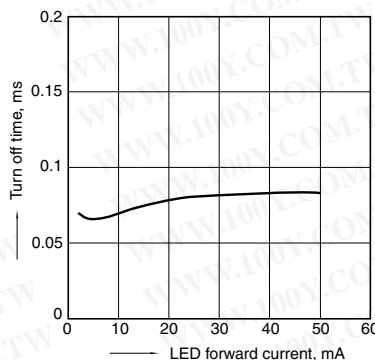
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4; Load voltage: Max.(DC); Continuous load current: Max.(DC); Ambient temperature: 25°C 77°F



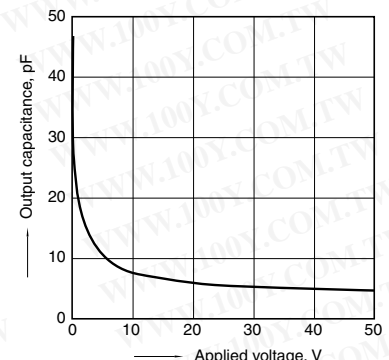
11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4; 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 3 and 4; Frequency: 1 MHz; Ambient temperature: 25°C 77°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.

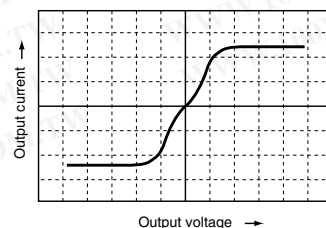
The current limit circuit built into the PhotoMOS thus controls the instantaneous load current to effectively ensure circuit safety.

This safety feature protects circuits downstream of the PhotoMOS against over-current.

But, if the current-limiting feature is used longer than the specified time, the PhotoMOS 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



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