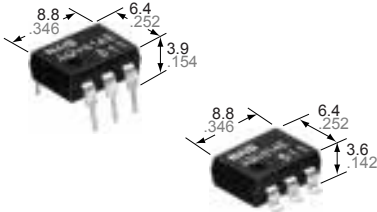


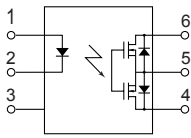
Panasonic
ideas for life

**DIP (1 Form B) 6-pin type.
Controls load voltage 400V.**

**GU PhotoMOS
(AQV414)**



mm inch



FEATURES

1. Low on resistance for normally-closed type

This has been realized thanks to the built-in MOSFET processed by our proprietary method, DSD (Double-diffused and Selective Doping) method.

2. Controls low-level analog signals

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

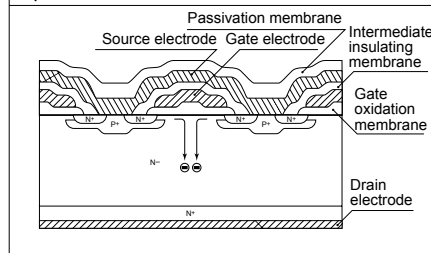
3. High sensitivity, low ON resistance

Can control a maximum 0.15 A load current with a 5 mA input current.

4. Low-level off state leakage current

The SSR has an off state leakage current of several milliamperes, whereas the PhotoMOS relay has typ. 100 pA even with the rated load voltage of 400 V.

Cross section of the normally-closed type of power MOS



TYPICAL APPLICATIONS

- Telepone equipment (Dial pulse)
- Measuring equipment

TYPES

Type	I/O isolation voltage	Output rating*		Part No.				Packing quantity	
				Through hole terminal	Surface-mount terminal			Tube	Tape and reel
					Tube packing style	Tape and reel packing style			
Load voltage	Load current		Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side					
AC/DC type	1,500 V AC	400 V	120 mA	AQV414	AQV414A	AQV414AX	AQV414AZ	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 SMD terminal shape indicator "A" and the package type indicator "X" and "Z" are omitted from the seal.

RATING

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

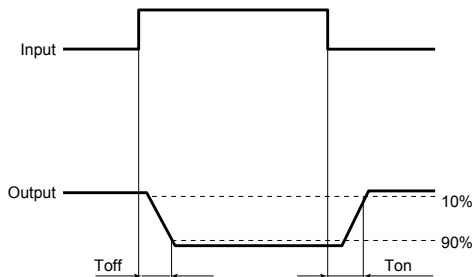
Item		Symbol	Type of connection	AQV414(A)	Remarks	
Input	LED forward current	I_F		50 mA		
	LED reverse voltage	V_R		5 V		
	Peak forward current	I_{FP}		1 A	f = 100 Hz, Duty factor = 0.1%	
	Power dissipation	P_{in}		75 mW		
Output	Load voltage (peak AC)	V_L		400 V		
	Continuous load current	I_L		A	0.12 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 temperatures	
	Storage	T_{stg}		-40°C to +100°C -40°F to +212°F		

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

Item			Symbol	Type of connection	AQV414(A)	Condition	
Input	LED operate (OFF) current	Typical	I_{Off}	—	1.0 mA	$I_L = 120 \text{ mA}$	
		Maximum			3.0 mA		
	LED reverse (ON) current	Minimum	I_{On}	—	0.4 mA	$I_L = 120 \text{ mA}$	
		Typical			0.95 mA		
	LED dropout voltage	Typical	V_F	—	1.25 V (1.14 V at $I_F = 5 \text{ mA}$)	$I_F = 50 \text{ mA}$	
		Maximum			1.5 V		
Output	On resistance	Typical	R_{on}	A	26 Ω	$I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time	
		Maximum			50 Ω		
		Typical	R_{on}	B	20 Ω	$I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time	
		Maximum			25 Ω		
	On resistance	Typical	R_{on}	C	10 Ω	$I_F = 0 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time	
		Maximum			12.5 Ω		
	Off state leakage current		Maximum	I_{Leak}	—	1 μA	$I_F = 5 \text{ mA}$ $V_L = 400 \text{ V}$
	Transfer characteristics	Switching speed	Operate (OFF) time*	Typical	T_{off}	—	0.47 ms
Maximum				1.0 ms			
Reverse (ON) time*			Typical	T_{on}	—	0.28 ms	$I_F = 5 \text{ mA} \rightarrow 0 \text{ mA}$ $I_L = 120 \text{ mA}$
			Maximum			1.0 ms	
I/O capacitance		Typical	C_{iso}	—	0.8 pF	$f = 1 \text{ MHz}$ $V_B = 0 \text{ V}$	
Initial I/O isolation resistance		Minimum			R_{iso}		—

Note: Recommendable LED forward current $I_F = 5 \text{ mA}$.

*Operate/Reverse time

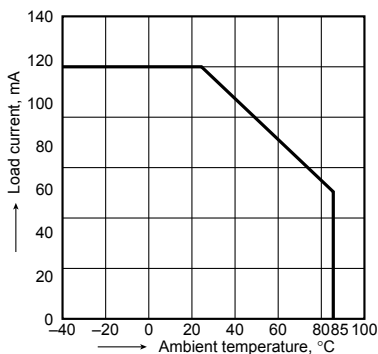


REFERENCE DATA

1. Load current vs. ambient temperature characteristics

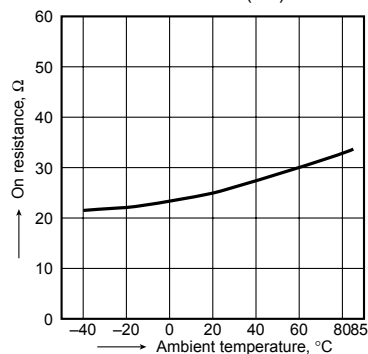
Allowable ambient temperature: -40°C to $+85^\circ\text{C}$
 -40°F to $+185^\circ\text{F}$

Type of connection: A



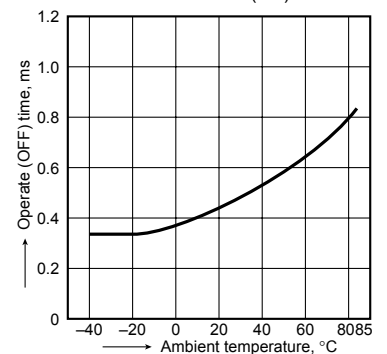
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
LED current: 0 mA;
Continuous load current: 120 mA (DC)



3. Operate (OFF) time vs. ambient temperature characteristics

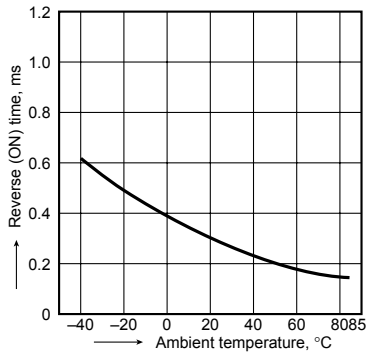
LED current: 5 mA;
Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



GU PhotoMOS (AQV414)

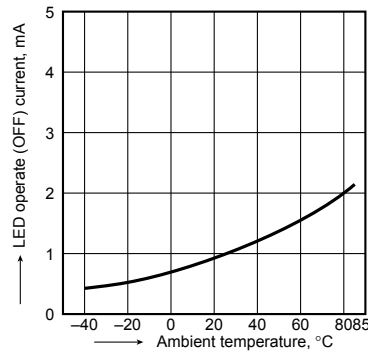
4. Reverse (ON) time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 400 V (DC);
Continuous load current: 120 mA (DC)



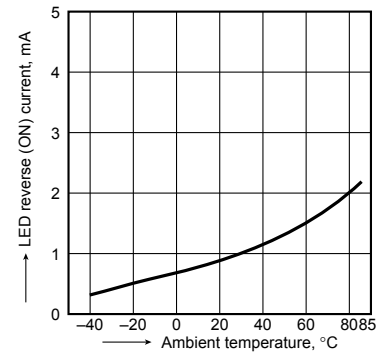
5. LED operate (OFF) current vs. ambient temperature characteristics

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



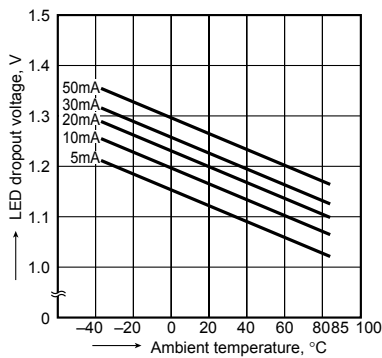
6. LED reverse (ON) current vs. ambient temperature characteristics

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



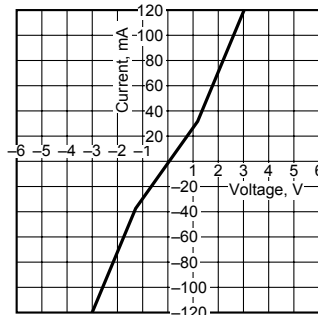
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



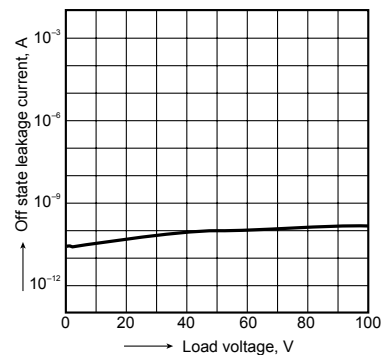
8. Current vs. voltage characteristics of output at MOS portion

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



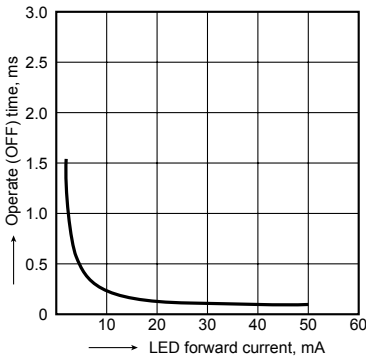
9. Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 4 and 6;
LED current: 5 mA; Ambient temperature: 25°C 77°F



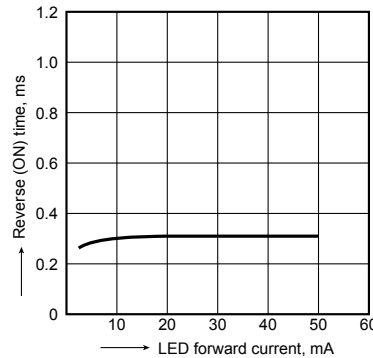
10. Operate (OFF) time vs. LED forward current characteristics

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



11. Reverse (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



12. Output capacitance vs. applied voltage characteristics

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

