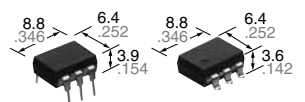


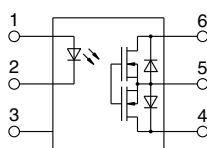
**Normally closed 6-pin type
of 400V load voltage**

**PhotoMOS®
GU 1 Form B
(AQV414)**



(Height includes standoff)

mm inch



RoHS compliant

FEATURES

1. Low on-resistance (Typ. 26Ω) for normally-closed type

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

2. Controls low-level analog signals

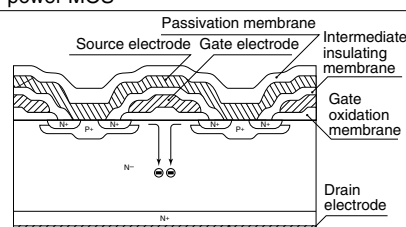
PhotoMOS feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

3. High sensitivity and low on-resistance

Can control max. 0.15 A load current with 5 mA input current.

4. Low-level off state leakage current of max. 1 μA

Cross section of the normally-closed type of power MOS



TYPICAL APPLICATIONS

- Security equipment
- Telephone equipment (Dial pulse)
- Measuring instruments

TYPES

	Output rating*		Package	Part No.				Packing quantity	
				Through hole terminal	Surface-mount terminal				
	Load voltage	Load current		Tube packing style		Tape and reel packing style		Tube	Tape and reel
		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	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: The surface mount terminal shape indicator "A" and the packing style indicator "X" or "Z" are not marked on the device.

RATING

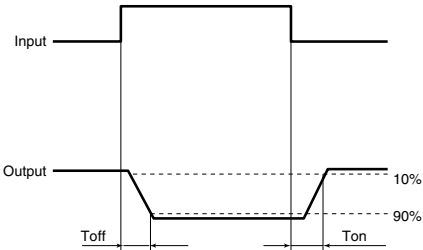
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item		Symbol	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 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		

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 = Max.
		Maximum			3.0 mA	
	LED reverse (ON) current	Minimum	I _{Fon}	—	0.4 mA	I _L = Max.
		Typical			0.95 mA	
	LED dropout voltage	Typical	V _F	—	1.25 V (1.14 V at I _F = 5 mA)	I _F = 50 mA
		Maximum			1.5 V	
Output	On resistance	Typical	R _{on}	A	26 Ω	I _F = 0 mA
		Maximum			50 Ω	I _L = Max. Within 1 s
		Typical	R _{on}	B	20 Ω	I _F = 0 mA
		Maximum			25 Ω	I _L = Max. Within 1 s
		Typical	R _{on}	C	10 Ω	I _F = 0 mA
		Maximum			12.5 Ω	I _L = Max. Within 1 s
	Off state leakage current	Maximum	I _{Leak}	—	1 μA	I _F = 5 mA V _L = Max.
	Transfer characteristics	Operate (OFF) time*	Typical	T _{off}	—	0.47 ms
Maximum			1.0 ms			I _L = Max.
Reverse (ON) time*		Typical	T _{on}	—	0.28 ms	I _F = 5 mA → 0 mA
		Maximum			1.0 ms	I _L = Max.
I/O capacitance		Typical	C _{iso}	—	0.8 pF	f = 1 MHz
		Maximum			1.5 pF	V _B = 0 V
Initial I/O isolation resistance	Minimum	R _{iso}	—	1,000 MΩ	500 V DC	

*Operate/Reverse 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
AQV414(A)	Load voltage (Peak AC)	V _L	—	320	V
	Continuous load current (A connection)	I _L	—	0.12	A

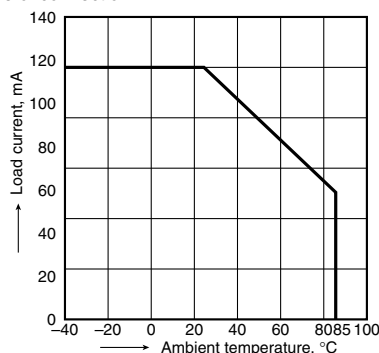
■ These products are not designed for automotive use.
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

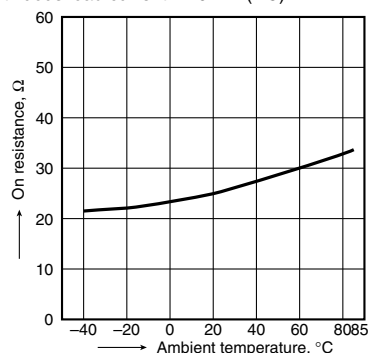
Allowable ambient temperature: -40 to $+85^{\circ}\text{C}$
 -40 to $+185^{\circ}\text{F}$

Type of connection: A



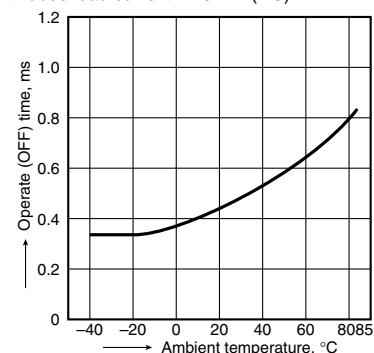
2. On resistance vs. ambient temperature characteristics

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



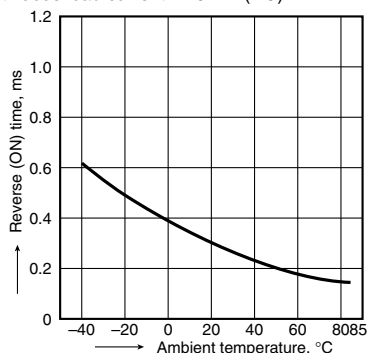
3. Operate (OFF) time vs. ambient temperature characteristics

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



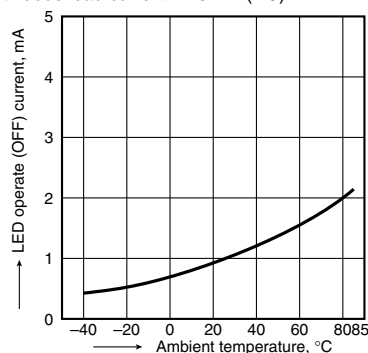
4. Reverse (ON) time vs. ambient temperature characteristics

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



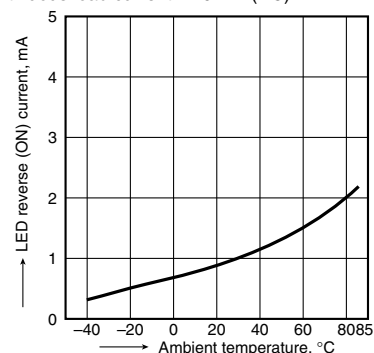
5. LED operate (OFF) current vs. ambient temperature characteristics

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



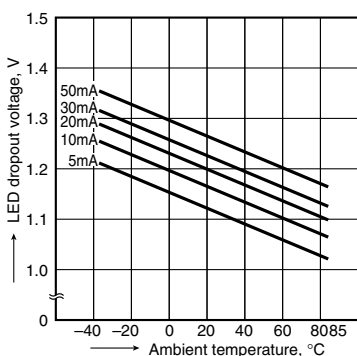
6. LED reverse (ON) current vs. ambient temperature characteristics

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



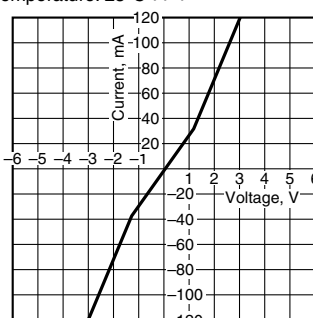
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



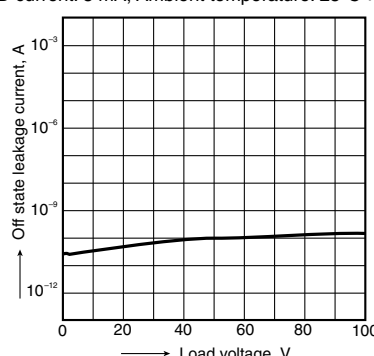
8. Current vs. voltage characteristics of output at MOS portion

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



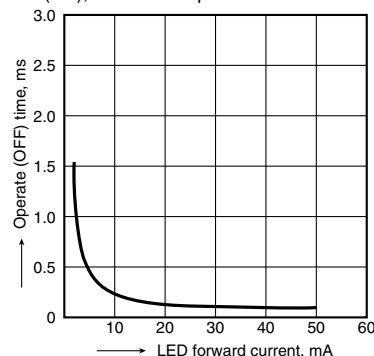
9. Off state leakage current vs. load voltage characteristics

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



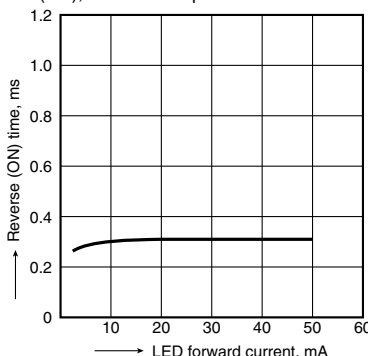
10. Operate (OFF) time vs. LED forward current characteristics

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



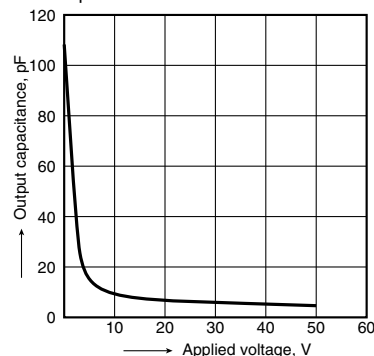
11. Reverse (ON) time vs. LED forward current characteristics

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;
 LED current: 5 mA; Frequency: 1 MHz;
 Ambient temperature: 25°C 77°F



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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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