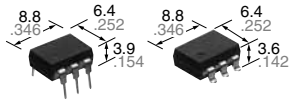
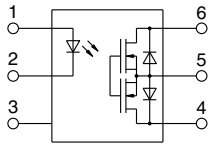
Normally closed 6-pin type of 400V load voltage

PhotoMOS® GU 1 Form B (AQV414)



(Height includes standoff)

mm inch

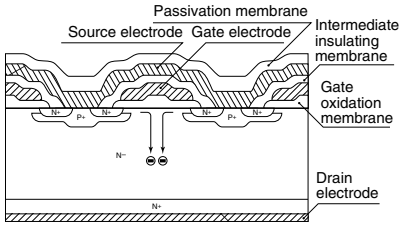


RoHS compliant

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.

Cross section of the normally-closed type of power MOS



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

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

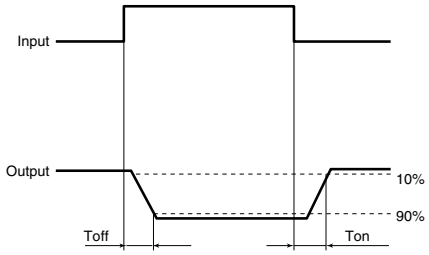
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

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_{Foff}	—	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 I_L = Max. Within 1 s
		Maximum			50 Ω	
		Typical	R_{on}	B	20 Ω	I_F = 0 mA I_L = Max. Within 1 s
		Maximum			25 Ω	
		Typical	R_{on}	C	10 Ω	I_F = 0 mA I_L = Max. Within 1 s
		Maximum			12.5 Ω	
	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	I_F = 0 mA → 5 mA I_L = Max.
		Maximum			1.0 ms	
	Reverse (ON) time*	Typical	T_{on}	—	0.28 ms	I_F = 5 mA → 0 mA I_L = Max.
		Maximum			1.0 ms	
	I/O capacitance	Typical	C_{iso}	—	0.8 pF	f = 1 MHz V_B = 0 V
		Maximum			1.5 pF	
	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

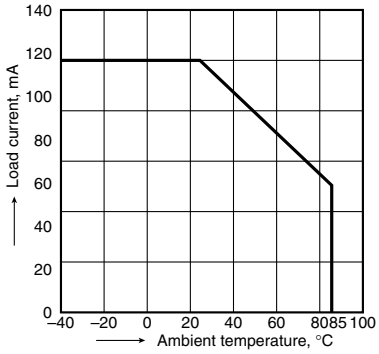
■ **These products are not designed for automotive use.**
If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

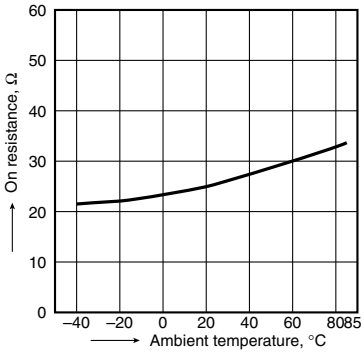
Allowable ambient temperature: –40 to +85°C
–40 to +185°F

Type of connection: A



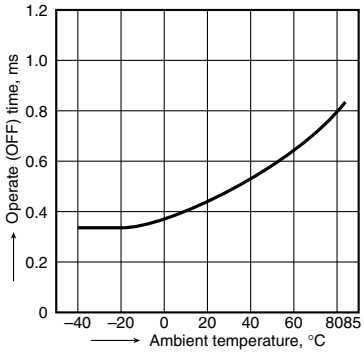
2. On resistance vs. ambient temperature characteristics

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



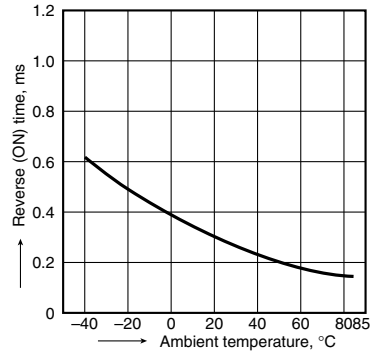
3. Operate (OFF) time vs. ambient temperature characteristics

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



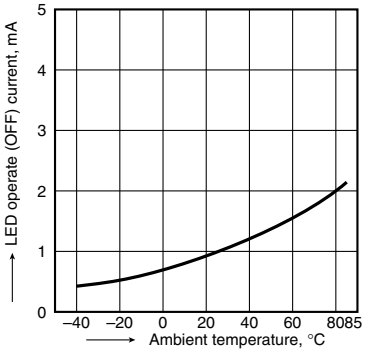
4. Reverse (ON) time vs. ambient temperature characteristics

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



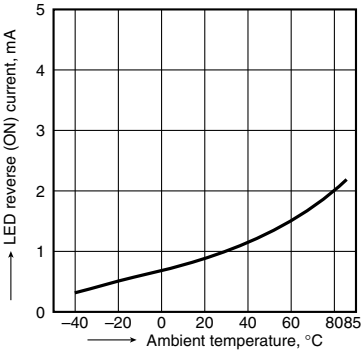
5. LED operate (OFF) current vs. ambient temperature characteristics

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



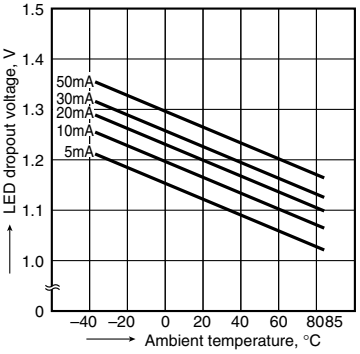
6. LED reverse (ON) current vs. ambient temperature characteristics

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



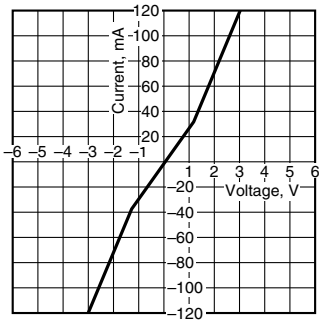
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



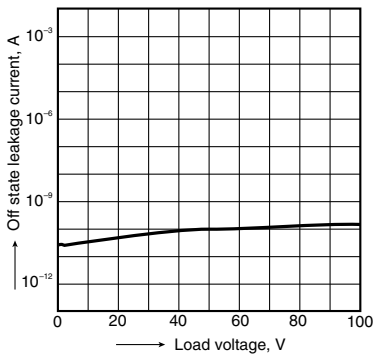
8. Current vs. voltage characteristics of output at MOS portion

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



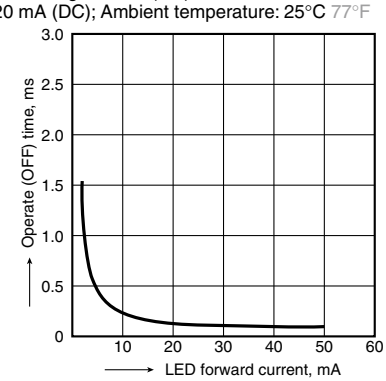
9. Off state leakage current vs. load voltage characteristics

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



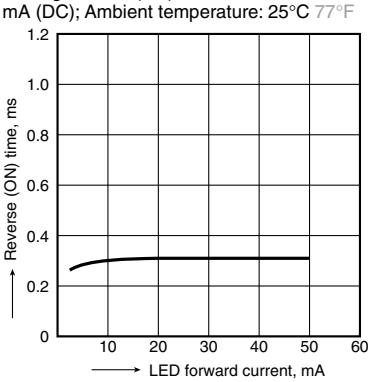
10. Operate (OFF) time vs. LED forward current characteristics

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



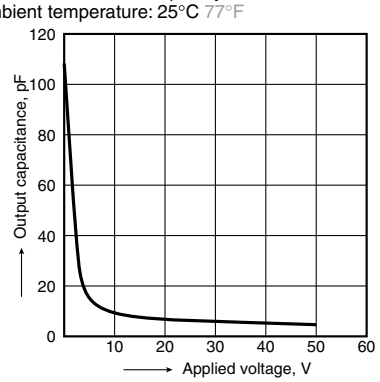
11. Reverse (ON) time vs. LED forward current characteristics

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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