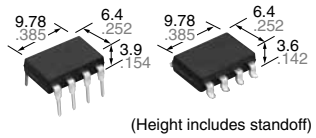
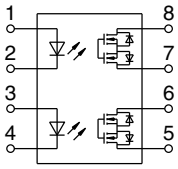
Compact DIP8-pin type of 60V to 600V load voltage

PhotoMOS® GU 2 Form A (AQW21❍)



(Height includes standoff)

mm inch



RoHS compliant

FEATURES

1. Compact 8-pin DIP size
The device comes in a compact (W) 6.4 × (L) 9.78 ×(H) 3.9 mm (W) .252×(L) .385×(H) .154 inch, 8-pin DIP size (through hole terminal type).

2. Applicable for 2 Form A use as well as two independent 1 Form A use

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

4. High sensitivity and high speed response
Can control max. 0.6 A load current with 5 mA input current. Fast operation speed of Typ. 0.65 ms (AQW212).

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

6. Wide variation of load voltage 60V to 600V

TYPICAL APPLICATIONS

- High-speed inspection machines
- Telephones equipment
- Computer

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 1/2/3/4-pin side	Picked from the 5/6/7/8-pin side		
AC/DC dual use	60V	500 mA	DIP8-pin	AQW212	AQW212A	AQW212AX	AQW212AZ	1 tube contains: 50 pcs. 1 batch contains: 500 pcs.	1,000 pcs.
	100 V	300 mA		AQW215	AQW215A	AQW215AX	AQW215AZ		
	200 V	160 mA		AQW217	AQW217A	AQW217AX	AQW217AZ		
	350 V	120 mA		AQW210	AQW210A	AQW210AX	AQW210AZ		
	400 V	100 mA		AQW214	AQW214A	AQW214AX	AQW214AZ		
	600 V	40 mA		AQW216	AQW216A	AQW216AX	AQW216AZ		

*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

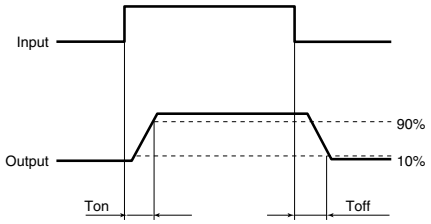
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item		Symbol	AQW212(A)	AQW215(A)	AQW217(A)	AQW210(A)	AQW214(A)	AQW216(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	60 V	100 V	200 V	350 V	400 V	600 V	
	Continuous load current	I_L	0.50 A (0.60A)	0.30 A (0.35 A)	0.16 A (0.2 A)	0.12 A (0.14 A)	0.10 A (0.13 A)	0.04 A (0.05 A)	Peak AC, DC ( ): in case of using only 1 channel
	Peak load current	I_{peak}	1.5 A	0.9 A	0.48 A	0.36 A	0.3 A	0.12 A	A connection: 100 ms (1 shot), V_L = DC
	Power dissipation	P_{out}	800 mW						
Total power dissipation		P_T	850 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	AQW212(A)	AQW215(A)	AQW217(A)	AQW210(A)	AQW214(A)	AQW216(A)	Condition
Input	LED operate current	Typical	I_{Fon}	0.9 mA						I_L = Max.
		Maximum		3 mA						
	LED turn off current	Minimum	I_{Foff}	0.4 mA						I_L = Max.
		Typical		0.8 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}	0.83 Ω	2.3 Ω	11 Ω	23 Ω	30 Ω	70 Ω	I_F = 5 mA I_L = Max. Within 1 s
		Maximum		2.5 Ω	4.0 Ω	15 Ω	35 Ω	50 Ω	120 Ω	
	Off state leakage current	Maximum	I_{Leak}	1 μA						I_F = 0 mA V_L = Max.
Transfer characteristics	Turn on time*	Typical	T_{on}	0.65 ms	0.60 ms	0.25 ms		0.31 ms	0.28 ms	I_F = 5 mA I_L = Max.
		Maximum		2 ms		1.0 ms	0.5 ms			
	Turn off time*	Typical	T_{off}	0.08 ms	0.06 ms	0.05 ms			0.04 ms	I_F = 5 mA I_L = Max.
		Maximum		0.2 ms						
	I/O capacitance	Typical	C_{iso}	0.8 pF						f = 1 MHz V_B = 0 V
		Maximum		1.5 pF						
	Initial I/C 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.

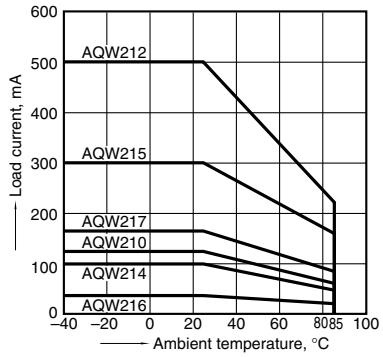
Item		Symbol	Number of used channels	Min.	Max.	Unit
LED current		I_F		5	30	mA
AQW212(A)	Load voltage (Peak AC)	V_L		—	48	V
	Continuous load current	I_L	1ch 2ch	—	0.6 0.5	A
AQW215(A)	Load voltage (Peak AC)	V_L		—	80	V
	Continuous load current	I_L	1ch 2ch	—	0.35 0.3	A
AQW217(A)	Load voltage (Peak AC)	V_L		—	160	V
	Continuous load current	I_L	1ch 2ch	—	0.2 0.16	A
AQW210(A)	Load voltage (Peak AC)	V_L		—	280	V
	Continuous load current	I_L	1ch 2ch	—	0.14 0.12	A
AQW214(A)	Load voltage (Peak AC)	V_L		—	320	V
	Continuous load current	I_L	1ch 2ch	—	0.13 0.1	A
AQW216(A)	Load voltage (Peak AC)	V_L		—	480	V
	Continuous load current	I_L	1ch 2ch	—	0.05 0.04	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

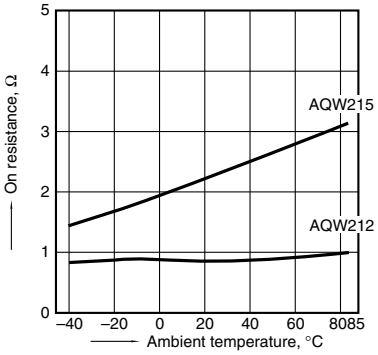
1. Load current vs. ambient temperature characteristics

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



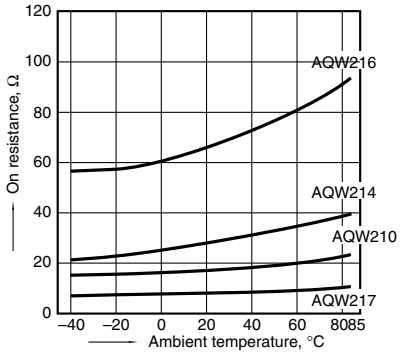
2.-(1) On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



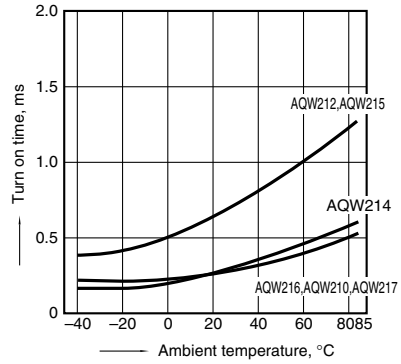
2.-(2) On resistance vs. ambient temperature characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



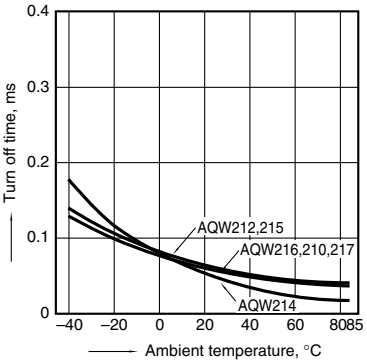
3. Turn on time vs. ambient temperature characteristics

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



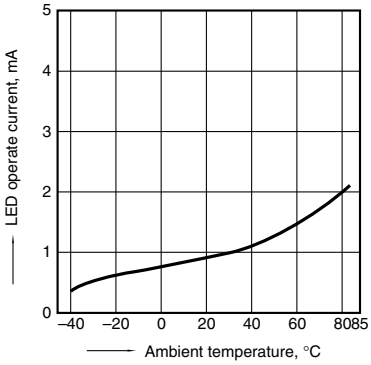
4. Turn off time vs. ambient temperature characteristics

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



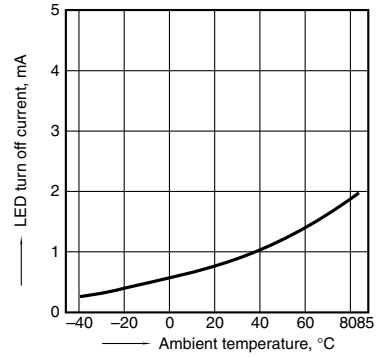
5. LED operate current vs. ambient temperature characteristics

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



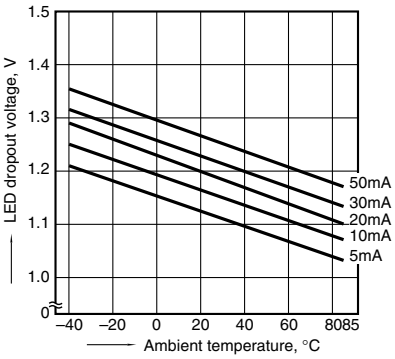
6. LED turn off current vs. ambient temperature characteristics

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



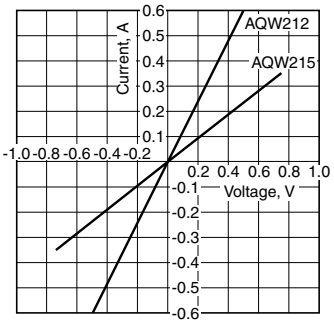
7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types;
LED current: 5 to 50 mA



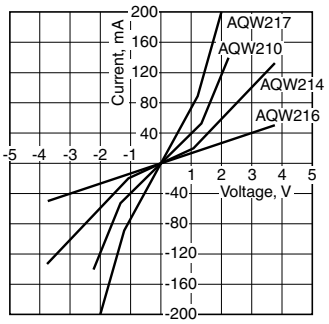
8.-(1) Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



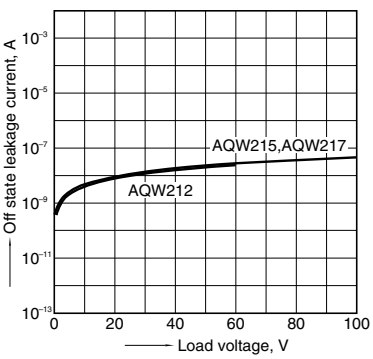
8.-(2) Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



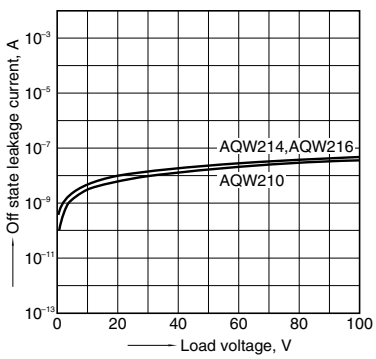
9.-(1) Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



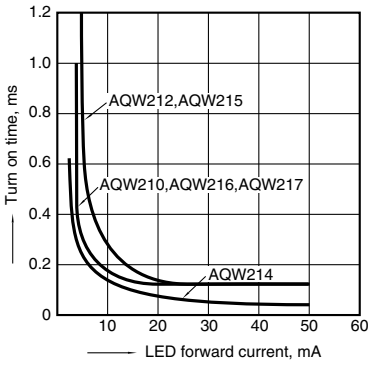
9.-(2) Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



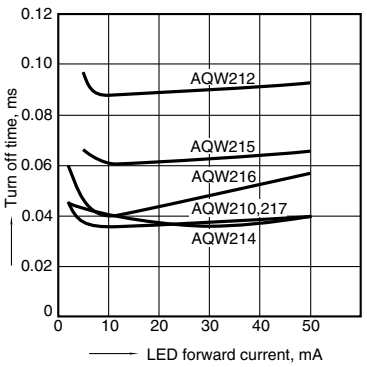
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



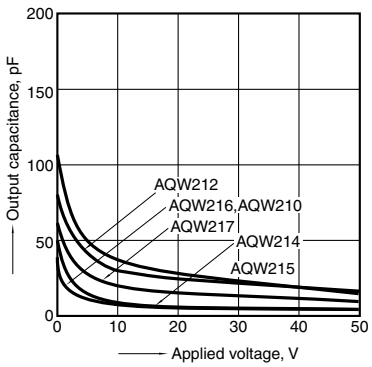
11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 5 and 6, 7 and 8;
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 5 and 6, 7 and 8;
Frequency: 1 MHz;
Ambient temperature: 25°C 77°F



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