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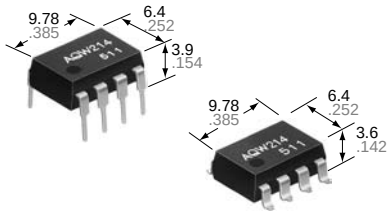
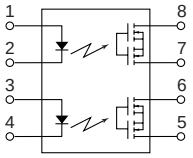
Compact DIP8-pin type of 60V to 600V load voltage

PhotoMOS Relays
GU 2 Form A
(AQW21❍)



mm inch



Compliance with RoHS Directive

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 relays 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: 40 pcs. 1 batch contains: 400 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 relay.

RATING

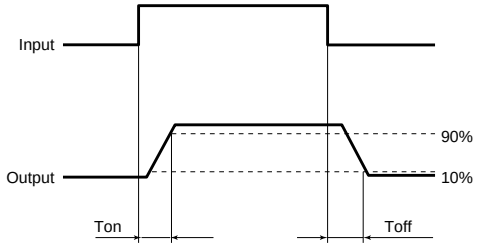
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

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}	1.0 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 V AC						Between input and output/between contact sets
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	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 son time
		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	0.25 ms	0.31 ms	0.28 ms	I_F = 5 mA I_L = Max.
		Maximum		2 ms	2 ms	1.0 ms	0.5 ms	0.5 ms	0.5 ms	
	Turn off time*	Typical	T_{off}	0.08 ms	0.06 ms	0.05 ms	0.05 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



RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper relay operation and resetting.

Item	Symbol	Recommended value	Unit
Input LED current	I_F	5	mA

■ For Dimensions

■ For Schematic and Wiring Diagrams

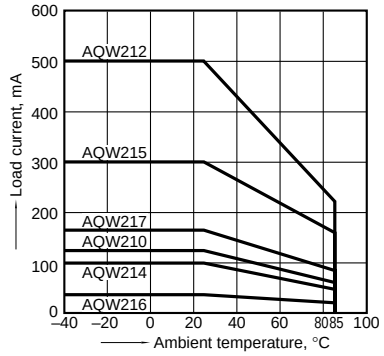
■ For Cautions for Use

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

REFERENCE DATA

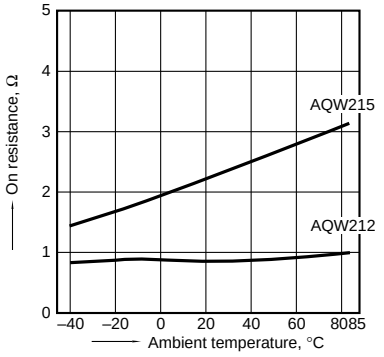
1. Load current vs. ambient temperature characteristics

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



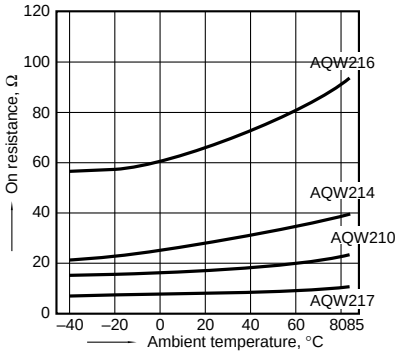
2.-(1) On resistance vs. ambient temperature characteristics

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)



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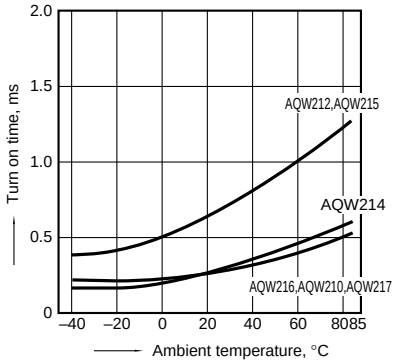
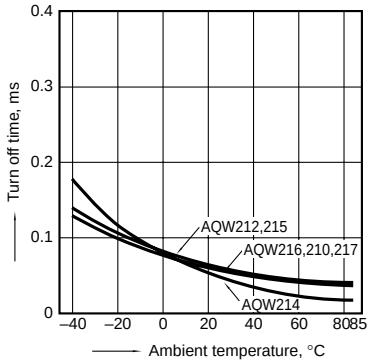
3. Turn on time vs. ambient temperature characteristics

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



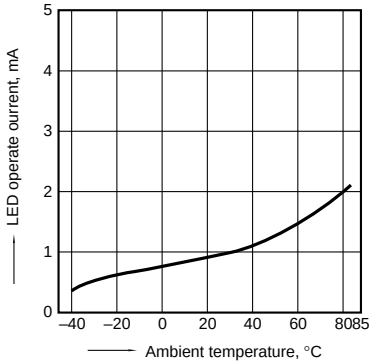
4. Turn off time vs. ambient temperature characteristics

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



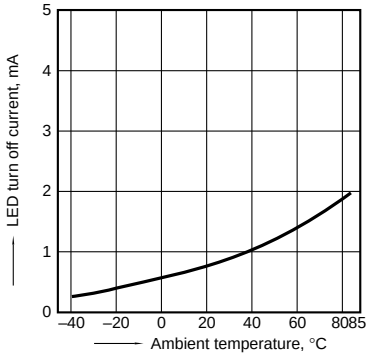
5. LED operate current vs. ambient temperature characteristics

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



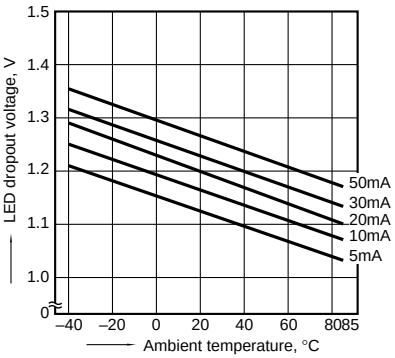
6. LED turn off current vs. ambient temperature characteristics

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



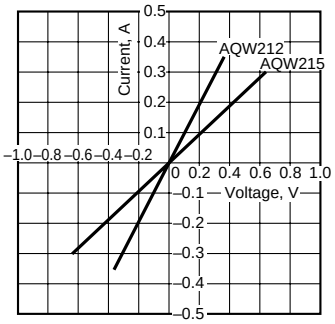
7. LED dropout voltage vs. ambient temperature characteristics

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



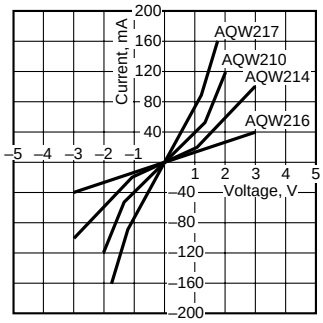
8.-(1) Current vs. voltage characteristics of output at MOS portion

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



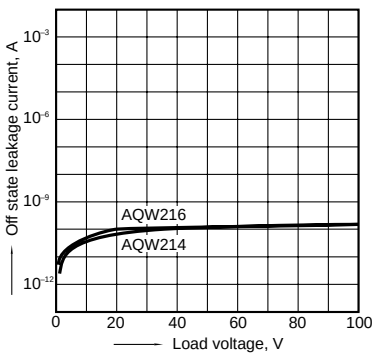
8.-(2) Current vs. voltage characteristics of output at MOS portion

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



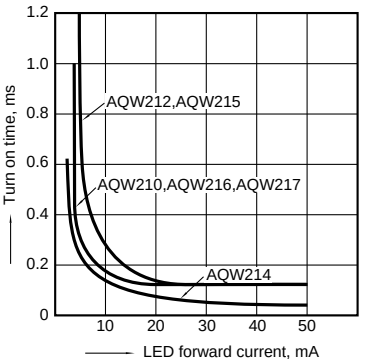
9. Off state leakage current vs. load voltage characteristics

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



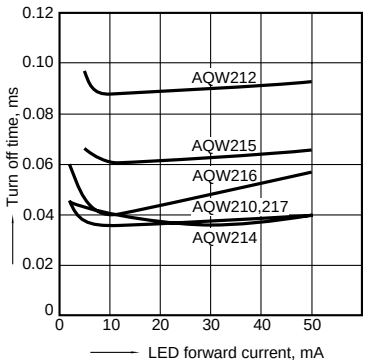
10. Turn on time vs. LED forward current characteristics

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