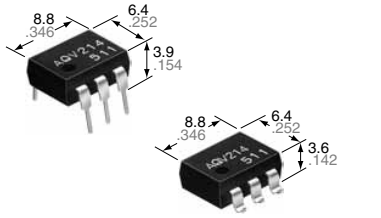
(Standard type) (Reinforced type)

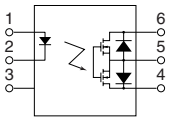
Panasonic
ideas for life

Controls low-level input signals. Controls load voltage 60V to 600V.

GU PhotoMOS (AQV21○, AQV214H)



mm inch



RoHS Directive compatibility information
http://www.mew.co.jp/ac/e/environment/

FEATURES

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

2. Control with low-level input signals

3. Controls various types of loads such as relays, motors, lamps and solenoids.

4. Optical coupling for extremely high isolation
Unlike mechanical relays, the PhotoMOS relay combines LED and optoelectronic device to transfer signals using light for extremely high isolation.

5. Eliminates the need for a counter electromotive force protection diode in the drive circuits on the input side

6. Stable on resistance

7. Low-level off state leakage current

8. Eliminates the need for a power supply to drive the power MOSFET
A power supply used to drive the power MOSFET is unnecessary because of the built-in optoelectronic device. This results in easy circuit design and small PC board area.

9. Low thermal electromotive force (Approx. 1 μV)

TYPICAL APPLICATIONS

- High-speed inspection machines
- Telephone equipment
- Data communication equipment
- Computer

TYPES

Type	I/O isolation	Output rating*		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	Standard 1,500 V AC	60V	550 mA	AQV212	AQV212A	AQV212AX	AQV212AZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs.
		100 V	320 mA	AQV215	AQV215A	AQV215AX	AQV215AZ		
		200 V	180 mA	AQV217	AQV217A	AQV217AX	AQV217AZ		
		350 V	130 mA	AQV210	AQV210A	AQV210AX	AQV210AZ		
		400 V	120 mA	AQV214	AQV214A	AQV214AX	AQV214AZ		
		600 V	50 mA	AQV216	AQV216A	AQV216AX	AQV216AZ		
	Reinforced 5,000 V	400 V	120 mA	AQV214H	AQV214HA	AQV214HAX	AQV214HAZ		

*Indicate the peak AC and DC values.
Note: For space reasons, the SMD terminal shape indicator “A” and the package style indicator “X” or “Z” are not marked on the relay.

RATING

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

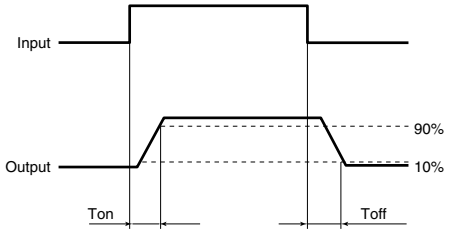
	Item		Sym-bol	Type of connec-tion	AQV212(A)	AQV215(A)	AQV217(A)	AQV210(A)	AQV214(A)	AQV216(A)	AQV214H(A)	Remarks
Input	LED forward current		I_F		50 mA							
	LED reverse voltage		V_R		5 V							
	Peak forward current		I_{FP}		1 A							f = 100 Hz, Duty factor = 0.1%
	Power dissipation		P_{in}		75 mW							
Output	Load voltage (peak AC)		V_L		60 V	100 V	200 V	350 V	400 V	600 V	400 V	
	Continuous load current		I_L	A	0.55 A	0.32 A	0.18 A	0.13 A	0.12 A	0.05 A	0.12 A	A connection: Peak AC, DC; B, C connection: DC
				B	0.65 A	0.42 A	0.22 A	0.15 A	0.13 A	0.06 A	0.13 A	
				C	0.80 A	0.60 A	0.30 A	0.17 A	0.15 A	0.08 A	0.15 A	
	Peak load current		I_{peak}		1.2 A	0.96 A	0.54 A	0.4 A	0.3 A	0.15 A	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						5,000 V AC	
Temperature limits		Operating	T_{opr}		–40°C to +85°C –40°F to +185°F							Non-condensing at low temp.
		Storage	T_{stg}		–40°C to +100°C –40°F to +212°F							

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

	Item			Sym-bol	Type of connec-tion**	AQV212(A)	AQV215(A)	AQV217(A)	AQV210(A)	AQV214(A)	AQV216(A)	AQV214H(A)	Condition
Input	LED operate current		Typical	I_{Fon}	—	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1.3 mA	I_L = Max.
			Maximum			3 mA	3 mA	3 mA	3 mA	3 mA	3 mA	3 mA	
	LED turn off current		Minimum	I_{Foff}	—	0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA	1.2 mA	I_L = Max.
			Typical			0.79 mA	0.79 mA	0.79 mA	0.79 mA	0.79 mA	0.79 mA	0.79 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	0.83 Ω	2.3 Ω	11.0 Ω	23 Ω	30 Ω	70 Ω	30 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
			Maximum			2.5 Ω	4.0 Ω	15.0 Ω	35 Ω	50 Ω	120 Ω	50 Ω	
			Typical	R_{on}	B	0.44 Ω	1.15 Ω	5.5 Ω	11.5 Ω	22.5 Ω	55 Ω	22.5 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
			Maximum			1.25 Ω	2.0 Ω	7.5 Ω	17.5 Ω	25 Ω	100 Ω	25 Ω	
			Typical	R_{on}	C	0.25 Ω	0.6 Ω	2.8 Ω	6.0 Ω	11.3 Ω	28 Ω	11.3 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
			Maximum			0.63 Ω	1.0 Ω	3.8 Ω	8.8 Ω	12.5 Ω	50 Ω	12.5 Ω	
	Output capacitance		Typical	C_{out}	A	150 pF	110 pF	70 pF	45 pF	45 pF	45 pF	45 pF	I_F = 0 mA V_B = 0 V f = 1 MHz
	Off state leakage current		Maximum	—	—	1 μA							I_F = 0 mA V_L = Max.
Transfer characteristics	Switching speed	Turn on time*	Typical	T_{on}	—	0.65 ms	0.6 ms	0.25 ms	0.25 ms	0.21 ms	0.28 ms	0.6 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	0.8 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	0.05 ms	I_F = 5 mA I_L = Max.
			Maximum			0.2 ms	0.2 ms	0.2 ms	0.2 ms	0.2 ms	0.2 ms	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/O isolation resistance		Minimum	R_{iso}	—	1,000 MΩ							500 V DC

Note: Recommendable LED forward current For type of connection.
Standard type: I_F = 5 mA
Reinforced type: I_F = 5 mA

*Turn on/Turn off time



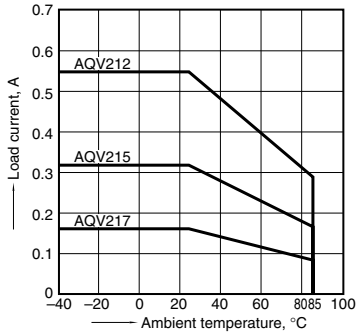
■ For Dimensions.
■ For Schematic and Wiring Diagrams.
■ For Cautions for Use.

REFERENCE DATA

1-(1). Load current vs. ambient temperature characteristics

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

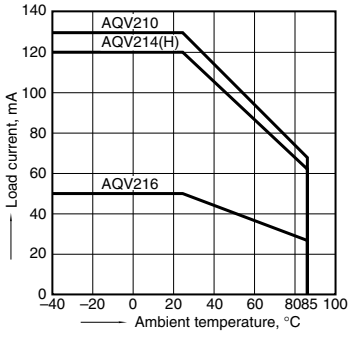
Type of connection: A



1-(2). Load current vs. ambient temperature characteristics

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

Type of connection: A



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

Measured portion: between terminals 4 and 6;
LED current: 5 mA; Load voltage: Max. (DC)
Continuous load current: Max. (DC)