Panasonic
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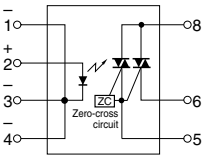
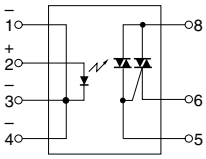
AQ-H SOLID STATE RELAY

AQ-H RELAYS





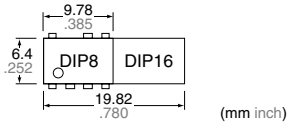
RoHS Directive compatibility information
http://www.nais-e.com/

FEATURES

1. Compact DIP type SSR that's ideal for AC load control

2. Supports 0.3 A, 0.6 A, 0.9 A and 1.2 A ON-state RMS currents.

3. The 1.2 A type saves space with a DIP 8-pin package. (Competitor only provides a 16-pin type.)



4. Handles both 100 and 200 V AC loads
This relay handles both voltages in a single product. It is not necessary for users that use both types to manage separate part numbers.

5. High dielectric strength: 5,000 V AC (between input and output)

6. Two types available: Zero-cross type and Non-zero-cross type

TYPICAL APPLICATIONS

1. Home appliances (air conditioners, microwave ovens, washing machines, personal hygiene systems, refrigerators, fan heaters, inductive heating cooker, and water heaters, etc.)

2. Industrial equipment market.

TYPES

Type	Output rating*		Type	Part No.				Packing quantity	
				Through hole terminal	Surface-mount terminal				
				Tube packing style		Tape and reel packing style		Tube	Tape and reel
	Repetitive peak OFF-state voltage	ON-state RMS current				Picked from the 1/2/3/4-pin side	Picked from the 5/6/8-pin side		
AC type	600 V	0.3 A	Zero-cross	AQH0213	AQH0213A	AQH0213AX	AQH0213AZ	1 tube contains 40 pcs. 1 batch contains 400 pcs.	1,000 pcs.
		0.6 A		AQH1213	AQH1213A	AQH1213AX	AQH1213AZ		
		0.9 A		AQH2213	AQH2213A	AQH2213AX	AQH2213AZ		
		1.2 A		AQH3213	AQH3213A	AQH3213AX	AQH3213AZ		
		0.3 A	Non zero-cross	AQH0223	AQH0223A	AQH0223AX	AQH0223AZ		
		0.6 A		AQH1223	AQH1223A	AQH1223AX	AQH1223AZ		
		0.9 A		AQH2223	AQH2223A	AQH2223AX	AQH2223AZ		
		1.2 A		AQH3223	AQH3223A	AQH3223AX	AQH3223AZ		

*Indicate the repetitive peak OFF-state voltage and ON-state RMS current: peak AC.
Note: For space reasons, the SMD terminal shape indicator "A" and the package type indicator "X" and "Z" are omitted from the seal.

RATING

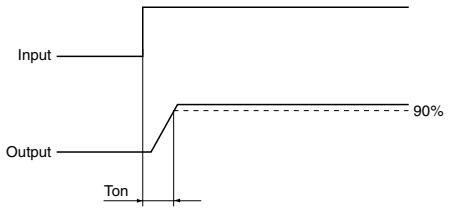
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item			Symbol	AQH0213(A)	AQH0223(A)	AQH1213(A)	AQH1223(A)	AQH2213(A)	AQH2223(A)	AQH3213(A)	AQH3223(A)	Remarks
Input	LED forward current		I_F	50 mA								
	LED reverse voltage		V_R	6 V								
	Peak forward current		I_{FP}	1 A								f = 100 Hz, Duty Ratio = 0.1%
Output	Repetitive peak OFF-state voltage		V_{DRM}	600 V								
	ON-state RMS current		$IT_{(RMS)}$	0.3 A		0.6 A		0.9 A		1.2 A		
	Non-repetitive surge current		I_{TSM}	3 A		6 A		9 A		12 A		60Hz, 1 cycle
I/O isolation voltage			V_{iso}	5,000 V AC								
Temperature limits		Operating	T_{opr}	–30°C to +85°C –22°F to +185°F								Non-condensing at low temperatures
		Storage	T_{stg}	–40°C to +125°C –40°F to +257°F								

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

Item			Symbol	AQH0213(A)	AQH1213(A)	AQH2213(A)	AQH3213(A)	AQH0223(A)	AQH1223(A)	AQH2223(A)	AQH3223(A)	Condition
Input	LED dropout voltage	Typical	V_F	1.18 V								I_F = 10 mA
		Maximum		1.3 V								
	LED reverse current	Typical	I_R	—								V_R = 6 V
		Maximum		10 μA								
Output	Peak OFF-state current	Typical	I_{DRM}	—								I_F = 0 mA V_{DRM} = 600 V
		Maximum		100 μA								
	Peak ON-state voltage	Typical	V_{TM}	—								I_F = 10 mA I_{TM} = Max.
		Maximum		2.5 V								
	Holding current	Typical	I_H	—								
		Maximum		25 mA								
	Critical rate of rise of OFF-state voltage	Minimum	dv/dt	200 V/μs								V_{DRM} = 600 V ×1/√2
Transfer characteristics	Trigger LED current*	Maximum	I_{FT}	10 mA								V_D = 6 V R_L = 100 Ω
	Zero-cross voltage**	Maximum	V_{ZC}	50 V				—				I_F = 10 mA
	Turn on time***	Maximum	T_{ON}	100 μs								I_F = 20 mA V_D = 6 V R_L = 100 Ω
	I/O isolation resistance	Minimum	R_{iso}	50 GΩ								500 V DC

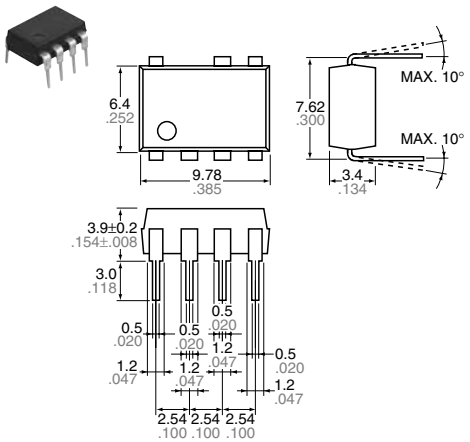
Notes: *Recommended LED current I_F: 20 mA
**Applicable part No.: AQH0213, AQH1213, AQH2213 and AQH3213.
***Turn on time



DIMENSIONS

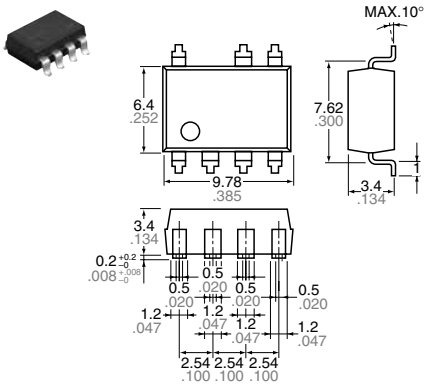
mm inch

Through hole terminal type



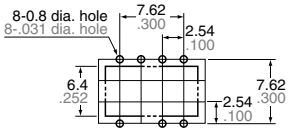
Terminal thickness: 0.25 .010
General tolerance: ±0.1 ±.004

Surface mount terminal type



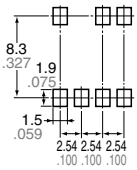
Terminal thickness: 0.25 .010
General tolerance: ±0.1 ±.004

PC board pattern
(BOTTOM VIEW)



Tolerance: ±0.1 ±.004

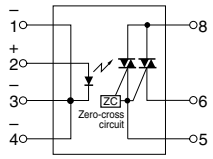
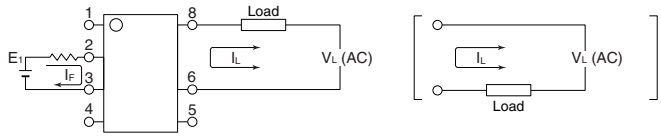
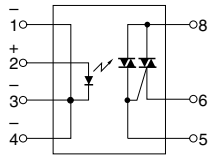
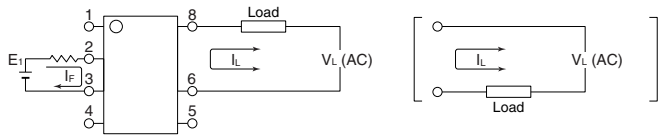
Recommended mounting pad
(TOP VIEW)



Tolerance: ±0.1 ±.004

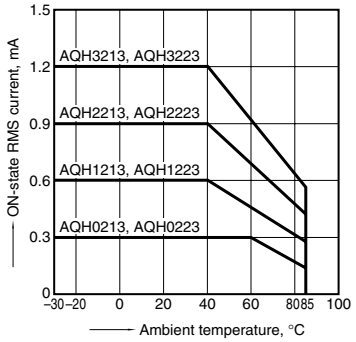
SCHEMATIC AND WIRING DIAGRAMS

Notes: E_1: Power source at input side; I_F: Trigger LED forward current; V_L: Load voltage; I_L: Load current;

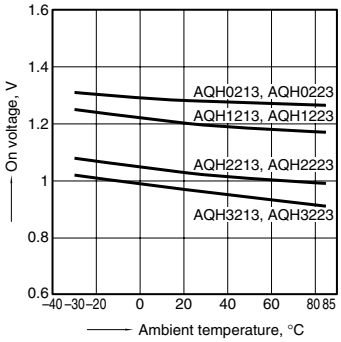
Schematic	Output configuration	Load	Wiring diagram
	1a	AC	
			

REFERENCE DATA

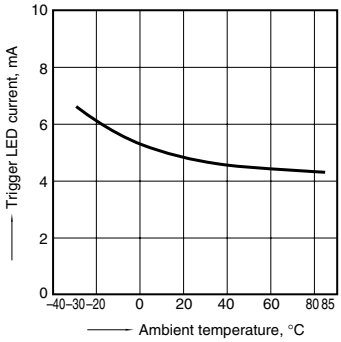
1. ON-state RMS current vs. Ambient temperature characteristics
Allowable ambient temperature:
–30°C to +85°C –22°F to +185°F



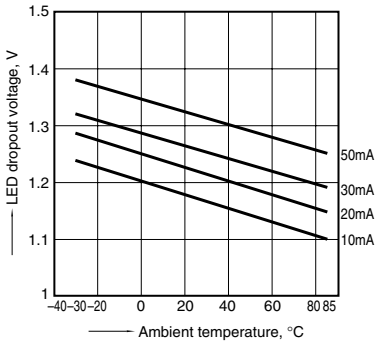
2. On voltage vs. Ambient temperature characteristics
LED current: 10 mA; ON current: Max.
Measured portion: between terminals 6 and 8



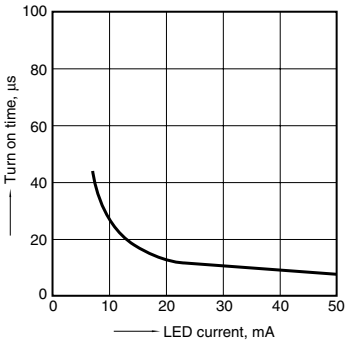
3. Trigger LED current vs. Ambient temperature characteristics
Load voltage: 6 V DC;
Load resistance: 100Ω



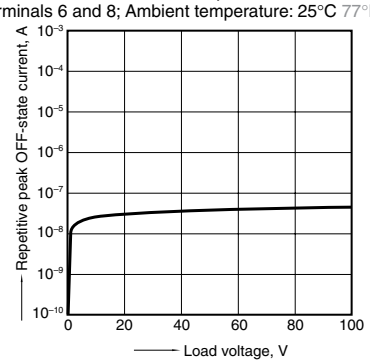
4. LED dropout voltage vs. Ambient temperature characteristics
LED current: 10 to 50 mA



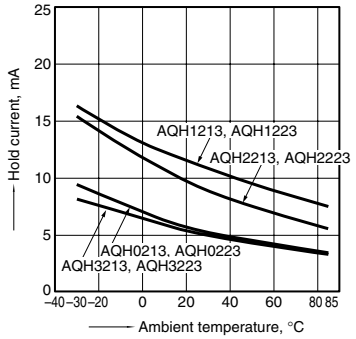
5. Turn on time vs. LED current characteristics
Load voltage: 6 V DC; Load resistance: 100Ω
Measured portion: between terminals 6 and 8



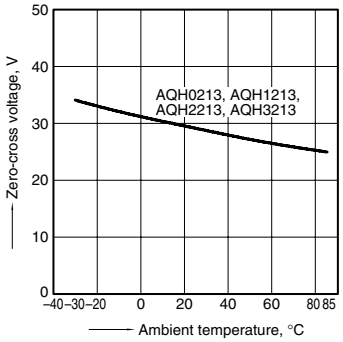
6. Repetitive peak OFF-state current vs. Load voltage characteristics
LED current: 0 mA; Measured portion: between terminals 6 and 8; Ambient temperature: 25°C 77°F



7. Hold current vs. Ambient temperature characteristics



8. Zero-cross voltage vs. Ambient temperature characteristics
LED current: 10 mA



For Cautions for Use