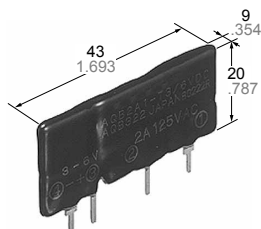


Panasonic
ideas for life

AQ-B SOLID STATE RELAY

AQ-B RELAYS



FEATURES

- **Two types available: Non zero-cross type and Zero-cross type**
Non zero-cross type permits phase control and Zero-cross type suppresses occurrence of noise.
- **Slim type**
The small-sized slim type (43 mm long × 9 mm wide × 24 mm high) (1.693×.354×.945 inch) permits high density mounting to PC board.
- **High dielectric strength: 1,500 V AC (between input and output)**
4,000 V AC (between input and output)

TYPICAL APPLICATIONS

- Copying equipment
- NC machines, sequencers, robots
- Air conditioners

TYPES

Type	Load voltage	Input voltage	Standard type (1,500 V AC)	Reinforced type (4,000 V AC)
			Part No.	Part No.
Zero-cross 1 A	75 to 125 V AC	3 to 6 V DC	AQB1A1-ZT3/6VDC	—
		7 to 14 V DC	AQB1A1-ZT7/14VDC	—
		10 to 18 V DC	AQB1A1-ZT10/18VDC	—
		18 to 30 V DC	AQB1A1-ZT18/30VDC	—
	75 to 250 V AC	3 to 6 V DC	AQB1A2-ZT3/6VDC	AQB1A2-ZV3/6VDC
		7 to 14 V DC	AQB1A2-ZT7/14VDC	AQB1A2-ZV7/14VDC
		10 to 18 V DC	AQB1A2-ZT10/18VDC	AQB1A2-ZV10/18VDC
		18 to 30 V DC	AQB1A2-ZT18/30VDC	AQB1A2-ZV18/30VDC
Zero-cross 2 A	75 to 125 V AC	3 to 6 V DC	AQB2A1-ZT3/6VDC	—
		7 to 14 V DC	AQB2A1-ZT7/14VDC	—
		10 to 18 V DC	AQB2A1-ZT10/18VDC	—
		18 to 30 V DC	AQB2A1-ZT18/30VDC	—
	75 to 250 V AC	3 to 6 V DC	AQB2A2-ZT3/6VDC	AQB2A2-ZV3/6VDC
		7 to 14 V DC	AQB2A2-ZT7/14VDC	AQB2A2-ZV7/14VDC
		10 to 18 V DC	AQB2A2-ZT10/18VDC	AQB2A2-ZV10/18VDC
		18 to 30 V DC	AQB2A2-ZT18/30VDC	AQB2A2-ZV18/30VDC
Non zero-cross 1 A	75 to 125 V AC	3 to 6 V DC	AQB1A1-T3/6VDC	—
		7 to 14 V DC	AQB1A1-T7/14VDC	—
		10 to 18 V DC	AQB1A1-T10/18VDC	—
		18 to 30 V DC	AQB1A1-T18/30VDC	—
	75 to 250 V AC	3 to 6 V DC	AQB1A2-T3/6VDC	AQB1A2-V3/6VDC
		7 to 14 V DC	AQB1A2-T7/14VDC	AQB1A2-V7/14VDC
		10 to 18 V DC	AQB1A2-T10/18VDC	AQB1A2-V10/18VDC
		18 to 30 V DC	AQB1A2-T18/30VDC	AQB1A2-V18/30VDC
Non zero-cross 2 A	75 to 125 V AC	3 to 6 V DC	AQB2A1-T3/6VDC	—
		7 to 14 V DC	AQB2A1-T7/14VDC	—
		10 to 18 V DC	AQB2A1-T10/18VDC	—
		18 to 30 V DC	AQB2A1-T18/30VDC	—
	75 to 250 V AC	3 to 6 V DC	AQB2A2-T3/6VDC	AQB2A2-V3/6VDC
		7 to 14 V DC	AQB2A2-T7/14VDC	AQB2A2-V7/14VDC
		10 to 18 V DC	AQB2A2-T10/18VDC	AQB2A2-V10/18VDC
		18 to 30 V DC	AQB2A2-T18/30VDC	AQB2A2-V18/30VDC

ORDERING INFORMATION

Ex. AQB 1A 1 — ZT 3/6VDC

Load current	Load voltage	Type		Input voltage
1A 2A	1: 75 to 125 V AC 2: 75 to 250 V AC	ZT: Zero-cross type: 1,500 V T: Non zero-cross type: 1,500 V	ZV: Zero-cross type: 4,000 V V: Non zero-cross type: 4,000 V	3/6, 7/14, 10/18, 18/30 V DC

AQ-B

SPECIFICATIONS

Ratings (at 20°C 68°F, Input voltage ripple: 1% or less)

1. Zero-cross type

1 A type

Item		Part No.								Remarks
		AQB1A1-ZT 3/6VDC	AQB1A1-ZT 7/14VDC	AQB1A1-ZT 10/18VDC	AQB1A1-ZT 18/30VDC	AQB1A2-ZT 3/6VDC AQB1A2-ZV 3/6VDC	AQB1A2-ZT 7/14VDC AQB1A2-ZV 7/14VDC	AQB1A2-ZT 10/18VDC AQB1A2-ZV 10/18VDC	AQB1A2-ZT 18/30VDC AQB1A2-ZV 18/30VDC	
Input side	Input voltage	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	
	Input impedance	Approx. 0.18 kΩ	Approx. 0.75 kΩ	Approx. 1.2 kΩ	Approx. 2.15 kΩ	Approx. 0.18 kΩ	Approx. 0.75 kΩ	Approx. 1.2 kΩ	Approx. 2.15 kΩ	
	Drop-out voltage, min.	1 V								
	Max. load current	1 A								See "DATA 1"
	Load voltage	75 to 125 V AC				75 to 250 V AC				
	Frequency	45 to 65 Hz								
Load side	Repetitive peak voltage, max.	400 V				600 V				
	Non-repetitive surge current	10A								In one cycle at 60 Hz
	"OFF-state" leakage current	0.6 mA/100 V applied				1.1 mA/200 V applied				at 60 Hz
	Max. "ON-state" voltage drop	1.6 V								at max. car- rying current
	Min. load current	10 mA				20 mA				
	OFF state dV/dt	100 V/μs								

2 A type

Item		Part No.								Remarks
		AQB2A1-ZT 3/6VDC	AQB2A1-ZT 7/14VDC	AQB2A1-ZT 10/18VDC	AQB2A1-ZT 18/30VDC	AQB2A2-ZT 3/6VDC AQB2A2-ZV 3/6VDC	AQB2A2-ZT 7/14VDC AQB2A2-ZV 7/14VDC	AQB2A2-ZT 10/18VDC AQB2A2-ZV 10/18VDC	AQB2A2-ZT 18/30VDC AQB2A2-ZV 18/30VDC	
Input side	Input voltage	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	
	Input impedance	Approx. 0.18 kΩ	Approx. 0.75 kΩ	Approx. 1.2 kΩ	Approx. 2.15 kΩ	Approx. 0.18 kΩ	Approx. 0.75 kΩ	Approx. 1.2 kΩ	Approx. 2.15 kΩ	
	Drop-out voltage, min.	1 V								
	Max. load current	2 A								See "DATA 1"
	Load voltage	75 to 125 V AC				75 to 250 V AC				
	Frequency	45 to 65 Hz								
Load side	Repetitive peak voltage, max.	400 V				600 V				
	Non-repetitive surge current	20A								In one cycle at 60 Hz
	"OFF-state" leakage current	0.6 mA/100 V applied				1.1 mA/200 V applied				at 60 Hz
	Max. "ON-state" voltage drop	1.6 V								at max. car- rying current
	Min. load current	10 mA				20 mA				
	OFF state dV/dt	100 V/μs								

2. Non zero-cross type

1 A type

Part No.		AQB1A1-T 3/6VDC	AQB1A1-T 7/14VDC	AQB1A1-T 10/18VDC	AQB1A1-T 18/30VDC	AQB1A2-T 3/6VDC AQB1A2-V 3/6VDC	AQB1A2-T 7/14VDC AQB1A2-V 7/14VDC	AQB1A2-T 10/18VDC AQB1A2-V 10/18VDC	AQB1A2-T 18/30VDC AQB1A2-V 18/30VDC	Remarks
Input side	Input voltage	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	
	Input impedance	Approx. 0.18 k Ω	Approx. 0.75 k Ω	Approx. 1.2 k Ω	Approx. 2.15 k Ω	Approx. 0.18 k Ω	Approx. 0.75 k Ω	Approx. 1.2 k Ω	Approx. 2.15 k Ω	
Load side	Drop-out voltage, min.	1 V								
	Max. load current	1 A								See "DATA 1"
	Load voltage	75 to 125 V AC				75 to 250 V AC				
	Frequency	45 to 65 Hz								
	Repetitive peak voltage, max.	400 V				600 V				
	Non-repetitive surge current	10A								In one cycle at 60 Hz
	"OFF-state" leakage current	0.6 mA/100 V applied				1.1 mA/200 V applied				at 60 Hz
	Max. "ON-state" voltage drop	1.6 V								at max. car- rying current
	Min. load current	10 mA				20 mA				
	OFF state dV/dt	100 V/ μ s								

2 A type

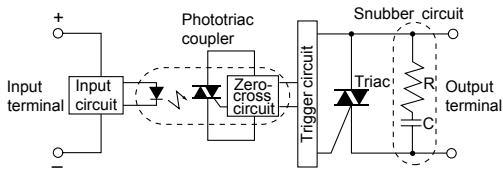
Part No.		AQB2A1-T 3/6VDC	AQB2A1-T 7/14VDC	AQB2A1-T 10/18VDC	AQB2A1-T 18/30VDC	AQB2A2-T 3/6VDC AQB2A2-V 3/6VDC	AQB2A2-T 7/14VDC AQB2A2-V 7/14VDC	AQB2A2-T 10/18VDC AQB2A2-V 10/18VDC	AQB2A2-T 18/30VDC AQB2A2-V 18/30VDC	Remarks
Input side	Input voltage	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	3 to 6 V DC	7 to 14 V DC	10 to 18 V DC	18 to 30 V DC	
	Input impedance	Approx. 0.18 k Ω	Approx. 0.75 k Ω	Approx. 1.2 k Ω	Approx. 2.15 k Ω	Approx. 0.18 k Ω	Approx. 0.75 k Ω	Approx. 1.2 k Ω	Approx. 2.15 k Ω	
Load side	Drop-out voltage, min.	1 V								
	Max. load current	2 A								See "DATA 1"
	Load voltage	75 to 125 V AC				75 to 250 V AC				
	Frequency	45 to 65 Hz								
	Repetitive peak voltage, max.	400 V				600 V				
	Non-repetitive surge current	20A								In one cycle at 60 Hz
	"OFF-state" leakage current	0.6 mA/100 V applied				1.1 mA/200 V applied				at 60 Hz
	Max. "ON-state" voltage drop	1.6 V								at max. car- rying current
	Min. load current	10 mA				20 mA				
	OFF state dV/dt	100 V/ μ s								

Characteristics (at 20°C 68°F, Input voltage ripple: less than 1%)

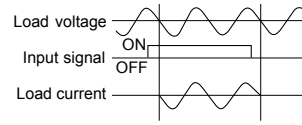
Item	Zero-cross type		Non zero-cross type		Remarks
	Standard type	Reinforced type	Standard type	Reinforced type	
Operate time, max.	(1/2 cycle of voltage sine wave) +1 ms		0.5 ms		
Release time, max.	(1/2 cycle of voltage sine wave) +1 ms				
Insulation resistance, min.	10 ⁹ Ω between input and output				
Breakdown voltage	1,500 V AC between input and output	4,000 V AC between input and output	1,500 V AC between input and output	4,000 V AC between input and output	For 1 minute
Vibration resistance	Functional	10 to 55 Hz at double amplitude of 3 mm			10 minutes for X, Y, Z axes
	Destructive	10 to 55 Hz at double amplitude of 3 mm			1 hour for X, Y, Z axes
Shock resistance	Functional	Min. 980 m/s ² {100 G}			4 times for X, Y, Z axes
	Destructive	Min. 980 m/s ² {100 G}			5 times for X, Y, Z axes
Ambient temperature	-20°C to +80°C -4°F to +176°F				
Storage temperature	-25°C to +85°C -13°F to +185°F				
Operational method	Zero-cross Turn-ON Zero-cross Turn-OFF		Random Turn-ON Zero-cross Turn-OFF		

OPERATING PRINCIPLE

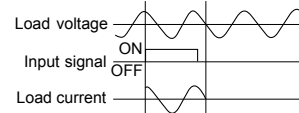
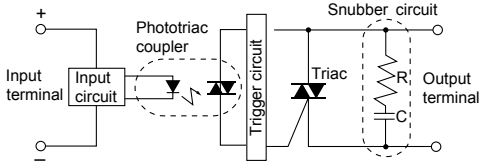
Internal circuit
Zero-cross type



Wave form of input and output (Resistive load)



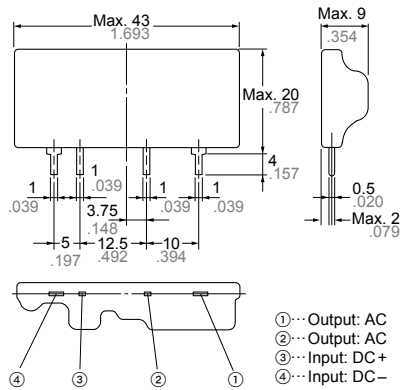
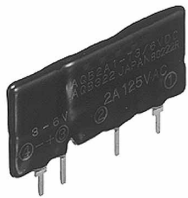
Non zero-cross type



DIMENSIONS

mm inch

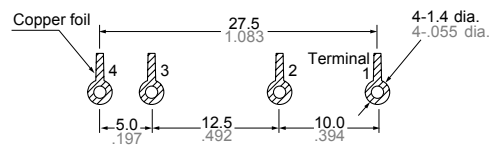
(Common for zero-cross and Non zero-cross type)



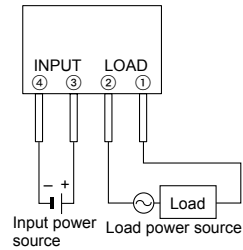
- ①---Output: AC
- ②---Output: AC
- ③---Input: DC+
- ④---Input: DC-

General tolerance: $\pm 0.5 \pm 0.020$

PC board pattern (BOTTOM VIEW)

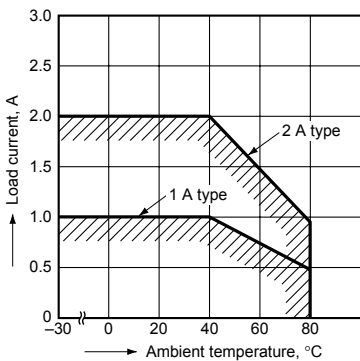


Terminal connection diagram

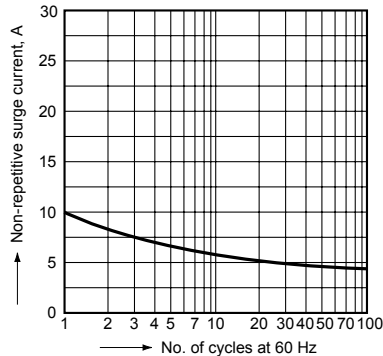


REFERENCE DATA

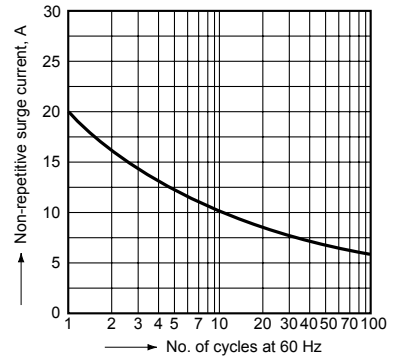
1. Load current vs. ambient temperature



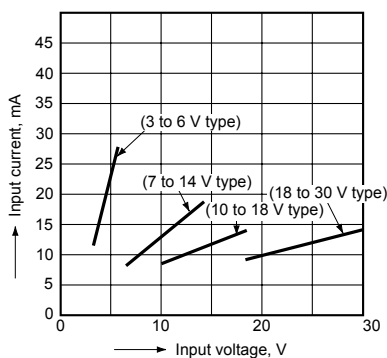
2-1. Non-repetitive surge current vs. carrying time (1 A type)



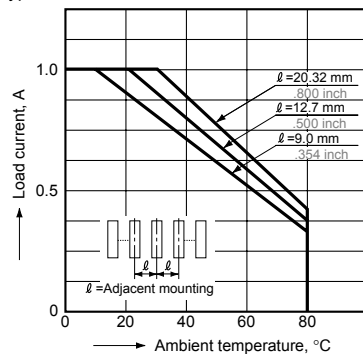
2-2. Non-repetitive surge current vs. carrying time (2 A type)



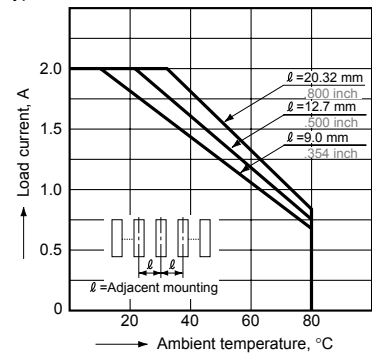
3. Input current vs. input voltage



4. Load current vs. ambient temperature for adjacent mounting
1 A type



2 A type



NOTE

