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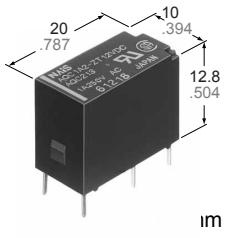
AQ-C SOLID STATE RELAY

AQ-C RELAYS



ım inch

FEATURES

- **Compact DIL type: 20 mm (length) × 10 mm (width) × 12.8 mm (height) (.787×.394×.504 inch)**
- **Excellent in noise resistance**
- **Snubber circuit integrated**
- **High dielectric strength: 2,500 V between input and output**
- **Reverse polarity type available**

TYPES

1. Input module

Type	Output voltage	Input voltage	Part No.
AC input	4 to 32 V DC	80 to 250 V AC	AQCD3-IM 100/240 V AC
DC input	4 to 32 V DC	3 to 32 V DC	AQCD3-IM 4/24 V DC

2. Output module

Type	Load voltage	Input voltage	Part No.
AC output Zero-cross	75 to 125 V AC	5 V DC	AQC1A1 - ZT5 V DC
		12 V DC	AQC1A1 - ZT12 V DC
		24 V DC	AQC1A1 - ZT24 V DC
	75 to 250 V AC	5 V DC	AQC1A2 - ZT5 V DC
		12 V DC	AQC1A2 - ZT12 V DC
		24 V DC	AQC1A2 - ZT24 V DC
AC output Non Zero-cross	75 to 125 V AC	5 V DC	AQC1A1 - T 5 V DC
		12 V DC	AQC1A1 - T 12 V DC
		24 V DC	AQC1A1 - T 24 V DC
	75 to 250 V AC	5 V DC	AQC1A2 - T 5 V DC
		12 V DC	AQC1A2 - T 12 V DC
		24 V DC	AQC1A2 - T 24 V DC
DC output	3 to 60 V DC	5 V DC	AQC1AD1- 5 V DC
		12 V DC	AQC1AD1- 12 V DC
		24 V DC	AQC1AD1- 24 V DC

ORDERING INFORMATION

AQC [1A] [D1] — [ZT] [5VDC] — [R]

Load current	Load voltage	Type	Input voltage	Input polarity
Nil: Input module 1A: Output module	1: 75 to 125 V AC (Output module) 2: 75 to 250 V AC (Output module) D1: 3 to 60 V DC (Output module) D3: 4 to 32 V DC (Input module)	Nil: DC output IM: Input module T: AC output Non Zero-cross ZT: AC output Zero-cross	Output module: 5, 12, 24 V DC Input module: 4/24 V DC, 100/240 V AC	Nil: Standard polarity R: Reverse polarity (Only for output module)

Standard packing: Carton: 50 pcs.; Case: 500 pcs.

SPECIFICATIONS

Rating [at 20°C 68°F; Input voltage ripple (output module) and output voltage ripple (input module): max. 1%]

1. Input module

Item	Type	AC input AQCD3-M 100/240 V AC	DC input AQCD3-IM 4/24 V DC	Remarks
Input side	Input voltage	80 to 250 V AC	3 to 32 V DC	
	Input current	Max. 5 mA	Max. 5 mA	
	Pick-up voltage	Max. 80 V AC	Max. 3 V DC	
	Drop-out voltage	Min. 10 V AC	Min. 1 V DC	
Output side	Load voltage	4 to 32 V DC	4 to 32 V DC	
	Load current	0.1 to 25 mA	0.1 to 25 mA	
	Max. “OFF-state” leakage current	Max. 5μA	Max. 5μA	When 32 V DC applied
	Max. “ON-state” voltage drop	Max. 1.6 V	Max. 1.6 V	at max. carrying current

2. Output module

(1) AC output type

Item \ Type		AQC1A1-ZT5VDC / AQC1A1-T5VDC	AQC1A1-ZT12VDC / AQC1A1-T12VDC	AQC1A1-ZT24VDC / AQC1A1-T24VDC	AQC1A2-ZT5VDC / AQC1A2-T5VDC	AQC1A2-ZT12VDC / AQC1A2-T12VDC	AQC1A2-ZT24VDC / AQC1A2-T24VDC	Remarks
Input side	Input voltage	(5 V type) 4 to 6 V DC	(12 V type) 9.6 to 14.4 V DC	(24 V type) 21.6 to 26.4 V DC	(5 V type) 4 to 6 V DC	(12 V type) 9.6 to 14.4 V DC	(24 V type) 21.6 to 26.4 V DC	See “Data 3”.
	Input impedance (Approx.)	0.3 k Ω	0.8 k Ω	1.8 k Ω	0.3 k Ω	0.8 k Ω	1.8 k Ω	
	Drop-out voltage, min	0.5 V	1.2 V	2.4 V	0.5 V	1.2 V	2.4 V	
Load side	Max. load current	1 A						See “Data 1”. Ta = Min. 40°C
	Load voltage	75 to 125 V AC			75 to 250 V AC			
	Non-repetitive surge current	20 A						See “Data 2”. In one cycle at 60 Hz
	Max. “OFF-state” leakage current	0.6 m A (When 100 V AC applied)			1.1 m A (When 200 V AC applied)			at 60 Hz
	Max. “ON-state” voltage drop	1.6 A						at max. carrying current
	Min. load current	10 mA			20 mA			

(2) DC output type

Item \ Type		AQC1AD1-5VDC	AQC1AD1-12VDC	AQC1AD1-24VDC	Remarks
Input side	Input voltage	(5 V type) 4 to 6 V DC	(12 V type) 9.6 to 14.4 V DC	(24 V type) 21.6 to 26.4 V DC	See “Data 3”.
	Input impedance (Approx.)	430 Ω	1.2 k Ω	2.8 k Ω	
	Drop-out voltage, min	0.8 V			
Load side	Max. load current	1 A			See “Data 1”. Ta = Min. 40°C
	Load voltage	3 to 60 V DC			
	Non-repetitive surge current	1.5 A			See “Data 2”. at 1s
	Max. “OFF-state” leakage current	0.1 m A (When 60 V DC applied)			
	Max. “ON-state” voltage drop	1.6 V			at max. carrying current
	Min. load current	1 mA			

Characteristics [at 20°C 68°F; Input voltage ripple (output module) and output voltage ripple (input module): max. 1%]

Input module

Item \ Type		AC Input	DC Input	Remarks
Operate time, max.		20 ms	0.5 ms	Input voltage: 24 V DC or 100V AC Output voltage: 24 V DC Output current: 25mA
Release time, max		20 ms	0.5 ms	
Insulation resistance, min.		10^9 Ω between input and output		at 500 V DC
Breakdown voltage		2,500 Vrms between input and output		For 1 minute
Vibration resistance	Functional	10 to 55Hz double amplitude of 3 mm		10 minutes for X,Y, Z, axis
	Destructive	10 to 55Hz double amplitude of 3 mm		1 hour for X,Y, Z, axis
Shock resistance	Functional	Min. 980 m/s² {100 G}		4 time each for X,Y,Z axis
	Destructive	Min. 980 m/s² {100 G}		5 time each for X,Y,Z axis
Ambient temperature		–30°C to +80°C –22°F to +176°F		
Storage temperature		–30°C to +100°C –22°F to +212°F		

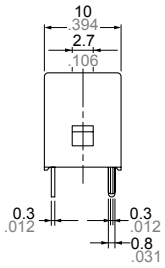
Output module

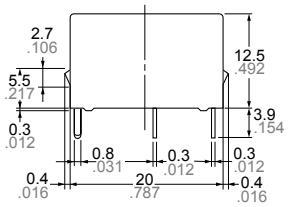
Item \ Type		AC output		DC output	Conditions
		Non zero-cross	Zero-cross		
Operate time, max.		1 ms	(1/2 cycle of voltage sine wave)+1ms	0.5 ms	
Release time, max.		(1/2 cycle of voltage sine wave)+1ms		1 ms	
Insulation resistance, min.		10^9Ω between input and output			at 500 V DC
Breakdown voltage		2,500 Vrms between input and output			For 1 minute
Vibration resistance	Functional	10 to 55Hz double amplitude of 3 mm			10 minutes for X,Y, Z, axis
	Destructive	10 to 55Hz double amplitude of 3 mm			1 hour for X,Y, Z, axis
Shock resistance	Functional	Min. 980 m/s² {100 G}			4 time each for X,Y,Z axis
	Destructive	Min. 980 m/s² {100 G}			5 time each for X,Y,Z axis
Ambient temperature		–30°C to +80°C –22°F to +176°F			
Storage temperature		–30°C to +100°C –22°F to +212°F			
Operational method		Random Turn-ON, Zero-cross Turn-OFF	Zero-cross (Turn-ON and Turn-OFF)	—	

DIMENSIONS

mm inch

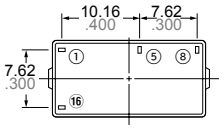
1. Input module (AC, DC)





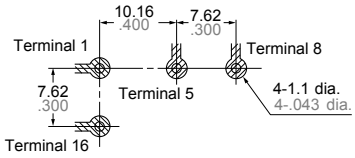
AC input
⑤··· Output: DC –
⑧··· Output: DC +
⑯··· Input: AC
①··· Input: AC
Case color: Yellow

DC input
⑤··· Output: DC –
⑧··· Output: DC +
⑯··· Input: DC +
①··· Input: DC –
Case color: White



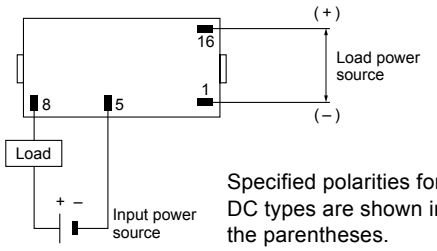
General tolerance: ±0.5 ±.020

PC board pattern (Copper-side view)



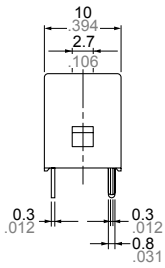
Tolerance: ±0.1 ±.004

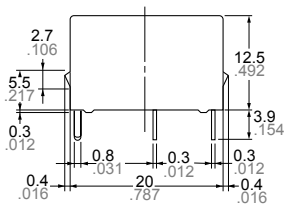
Schematic



Specified polarities for DC types are shown in the parentheses.

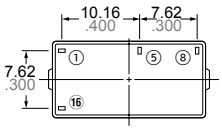
2. Output module (AC, DC)





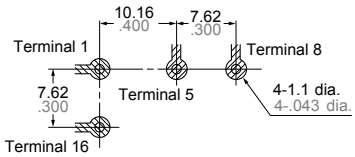
AC output
⑤··· Output: AC
⑧··· Output: AC
⑯··· Input: DC +
①··· Input: DC –
Case color: Black

DC output
⑤··· Output: DC –
⑧··· Output: DC +
⑯··· Input: DC +
①··· Input: DC –
Case color: Red



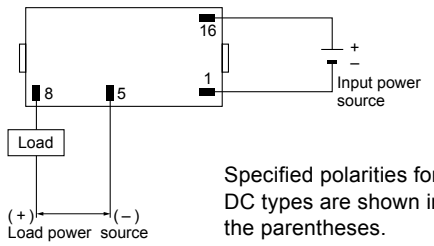
General tolerance: ±0.5 ±.020

PC board pattern (Copper-side view)



Tolerance: ±0.1 ±.004

Schematic



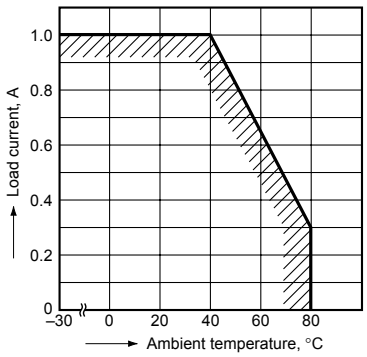
Specified polarities for DC types are shown in the parentheses.

ACCESSORY

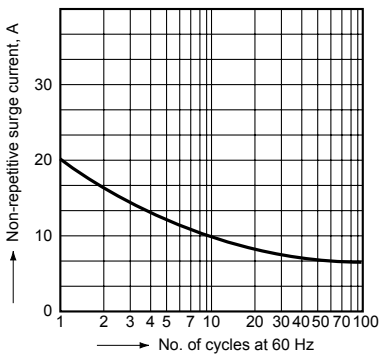
PCIA-PS

REFERENCE DATA

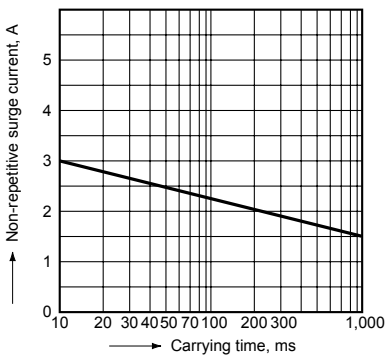
1. Load current vs. ambient temperature

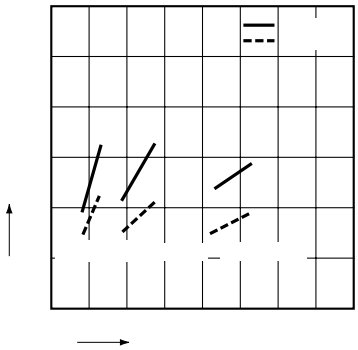


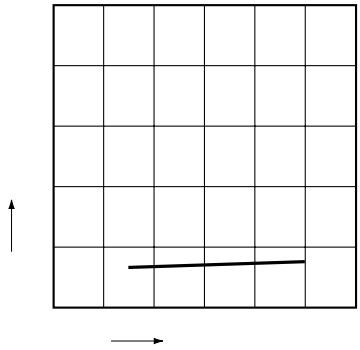
2.-(1) Non-repetitive surge current vs. carrying time (AC output)

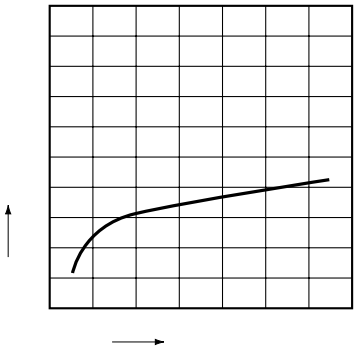


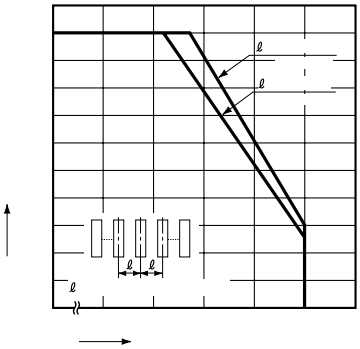
2.-(2) Non-repetitive surge current vs. carrying time (DC output)











NOTE