Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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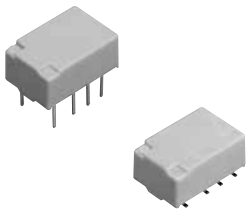
Small size controlled 3.5 A inrush current possible

GQ RELAYS TH types



RoHS compliant

FEATURES

1. **Small size controlled 3.5 A inrush current possible**
2. **2.4 coil voltage type newly available DC battery operation**
3. **Flat compact size**
   10.6 (L) × 7.2 (W) × 5.2 (H) mm
   .417 (L) × .283 (W) × .205 (H) inch

TYPICAL APPLICATIONS

1. **Thermostat (HVAC temperature controller)**
2. **Others, High-capacity control etc.**

ORDERING INFORMATION

AGQ [2] [ ] [T] [ ] [ ] [ ] [ ]

Contact arrangement
2: 2 Form C

Operating function
0: Single side stable
1: 1 coil latching

Type of operation
T: Power type (B.B.M.)

Terminal shape
Nil: Standard PC board terminal
A: Surface-mount terminal A type
S: Surface-mount terminal S type

Nominal coil voltage (DC)
1H: 1.5V 2H: 2.4V 03: 3V 4H: 4.5V 06: 6V
09: 9V 12: 12V 24: 24V

Packing style
Nil: Tube packing
X: Tape and reel packing (picked from 1/2/3/4 pin side)
Z: Tape and reel packing (picked from 5/6/7/8 pin side)

TYPES

1. Standard PC board terminal

Nominal coil voltage	Single side stable	1 coil latching
	Part No.	Part No.
1.5 V DC	AGQ20T1H	AGQ21T1H
2.4 V DC	AGQ20T2H	AGQ21T2H
3 V DC	AGQ20T03	AGQ21T03
4.5 V DC	AGQ20T4H	AGQ21T4H
6 V DC	AGQ20T06	AGQ21T06
9 V DC	AGQ20T09	AGQ21T09
12 V DC	AGQ20T12	AGQ21T12
24 V DC	AGQ20T24	AGQ21T24

Standard packing: Tube: 50 pcs.; Case: 1,000 pcs.

2. Surface-mount terminal

1) Tube packing

Nominal coil voltage	Single side stable	1 coil latching
	Part No.	Part No.
1.5 V DC	AGQ20T□1H	AGQ21T□1H
2.4 V DC	AGQ20T□2H	AGQ21T□2H
3 V DC	AGQ20T□03	AGQ21T□03
4.5 V DC	AGQ20T□4H	AGQ21T□4H
6 V DC	AGQ20T□06	AGQ21T□06
9 V DC	AGQ20T□09	AGQ21T□09
12 V DC	AGQ20T□12	AGQ21T□12
24 V DC	AGQ20T□24	AGQ21T□24

□: For each surface-mounted terminal identification, input the following letter. A type: A, S type: S
Standard packing: Tube: 50 pcs.; Case: 1,000 pcs.

2) Tape and reel packing

Nominal coil voltage	Single side stable	1 coil latching
	Part No.	Part No.
1.5 V DC	AGQ20T□1HZ	AGQ21T□1HZ
2.4 V DC	AGQ20T□2HZ	AGQ21T□2HZ
3 V DC	AGQ20T□03Z	AGQ21T□03Z
4.5 V DC	AGQ20T□4HZ	AGQ21T□4HZ
6 V DC	AGQ20T□06Z	AGQ21T□06Z
9 V DC	AGQ20T□09Z	AGQ21T□09Z
12 V DC	AGQ20T□12Z	AGQ21T□12Z
24 V DC	AGQ20T□24Z	AGQ21T□24Z

□: For each surface-mounted terminal identification, input the following letter. A type: A, S type: S
Standard packing: Tape and reel: 900 pcs.; Case: 1,800 pcs.
Notes: 1. Tape and reel packing symbol "-Z" is not marked on the relay. "X" type tape and reel packing (picked from 1/2/3/4-pin side) is also available.
2. Please inquire if you require a relay, between 1.5 and 24 V DC, with a voltage not listed.

RATING

1. Coil data

1) Single side stable type

Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
1.5 V DC	75%V or less of nominal voltage* (Initial)	10%V or more of nominal voltage* (Initial)	93.8 mA	16 Ω	140 mW	150%V of nominal voltage
2.4 V DC			58.5 mA	41 Ω		
3 V DC			46.7 mA	64.2 Ω		
4.5 V DC			31 mA	145 Ω		
6 V DC			23.3 mA	257 Ω		
9 V DC			15.5 mA	579 Ω		
12 V DC			11.7 mA	1,028 Ω		
24 V DC			9.6 mA	2,504 Ω	230 mW	120%V of nominal voltage

2) 1 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
1.5 V DC	75%V or less of nominal voltage* (Initial)	75%V or less of nominal voltage* (Initial)	66.7 mA	22.5 Ω	100 mW	150%V of nominal voltage
2.4 V DC			41.7 mA	57.6 Ω		
3 V DC			33.3 mA	90 Ω		
4.5 V DC			22.2 mA	202.5 Ω		
6 V DC			16.7 mA	360 Ω		
9 V DC			11.1 mA	810 Ω		
12 V DC			8.3 mA	1,440 Ω		
24 V DC			5.0 mA	4,800 Ω	120 mW	

*Pulse drive (JIS C 5442-1996)

2. Specifications

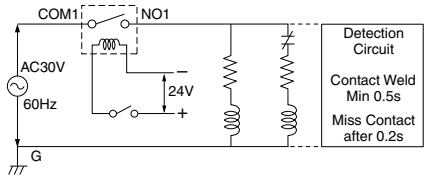
Characteristics	Item		Specifications
Contact	Arrangement		2 Form C
	Contact resistance (Initial)		Max. 100 mΩ (By voltage drop 6 V DC 1A)
	Contact material		AgNi + Au plating
Rating	Nominal switching capacity (resistive)		2 A 30 V DC, 1 A 30 V DC, 0.3 A 125 V AC
	Max. switching power (resistive)		60 W (DC), 30 W (DC), 37.5 V A (AC)
	Max. switching voltage		110 V DC, 125 V AC
	Max. switching current		2 A (AC, DC)
	Min. switching capacity (Reference value)*1		10μA 10 mV DC
	Nominal operating power	Single side stable	140mW (1.5 to 12 V DC), 230mW (24 V DC)
		1 coil latching	100mW (1.5 to 12 V DC), 120mW (24 V DC)
Electrical characteristics	Insulation resistance (Initial)		Min. 1,000MΩ (at 500V DC) Measured portion is the same as the case of dielectric voltage
	Breakdown voltage (Initial)	Between open contacts	750 Vrms for 1min. (Detection current: 10mA)
		Between contact and coil	1,500 Vrms for 1min. (Detection current: 10mA)
		Between contact sets	1,000 Vrms for 1min. (Detection current: 10mA)
	Surge breakdown voltage (Initial)	Between open contacts	1,500 V (10×160μs) (FCC Part 68)
		Between contact and coil	2,500 V (2×10μs) (Telcordia)
	Temperature rise (at 20°C 68°F)		Max. 50°C (By resistive method, nominal coil voltage applied to the coil; contact carrying current: 2A)
	Operate time [Set time] (at 20°C 68°F) (Initial)		Max. 4 ms [Max. 4 ms] (Nominal coil voltage applied to the coil, excluding contact bounce time.)
	Release time [Reset time] (at 20°C 68°F) (Initial)		Max. 4 ms [Max. 4 ms] (Nominal coil voltage applied to the coil, excluding contact bounce time.) (without diode)
Mechanical characteristics	Shock resistance	Functional	Min. 750 m/s² (half -sine shock pulse: 6 ms; detection time: 10μs.)
		Destructive	Min. 1,000 m/s² (half -sine shock pulse: 6 ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 3.3 mm (Detection time: 10μs.)
		Destructive	10 to 55 Hz at double amplitude of 5.0 mm
Expected life	Mechanical		Min. 5×10^7 (at 180 cpm)
	Electrical		Min. 1×10^5 (1A 30V DC resistive) Min. 1×10^5 (3.5A inrush (250ms)/1A 30V AC (cosϕ=0.4)) (ON/OFF=1s/9s)
Conditions	Conditions for operation, transport and storage*2		Ambient temperature: (Single side stable, 1 coil latching type) –40°C to +85°C –40°F to +185°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)
	Max. operating speed (at rated load)		20 cpm
Unit weight			Approx. 1.0 g .035 oz

Notes: *1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.
*2 Refer to "AMBIENT ENVIRONMENT" in GENERAL APPLICATION GUIDELINES.

REFERENCE DATA

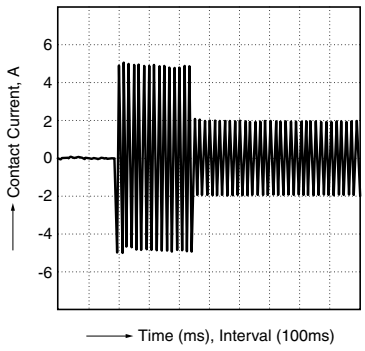
1. Electrical life (1×10^5 operation is possible)

Tested sample: AGQ21TA03, 6 pcs.
Switching frequency: ON:OFF = 1s:9s
Ambient temperature: 25°C 77°F
Circuit



Condition: 30V AC
Inrush current: 3.5A (effective value),
Inrush time 250ms
steady current: 1.0A (effective value),
(Inductive load cosϕ = 0.4)

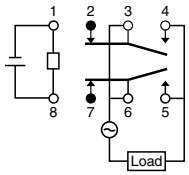
Inrush current wave form VS time



***Precaution**

When using at 3.5A, connection of NO (pin #5 and #8) and COM (pin #4 and #9) in the circuit is required.

Pin layout and schematic (Bottom View)
1 coil latching

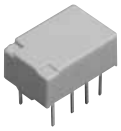


DIMENSIONS (mm inch)

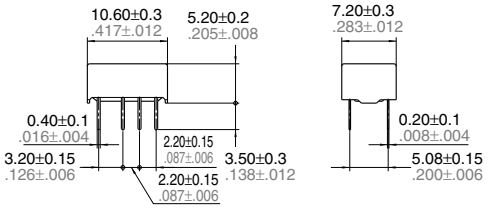
The CAD data of the products with a CAD Data mark can be downloaded from: http://industrial.panasonic.com/ac/e/

1. PC board terminal

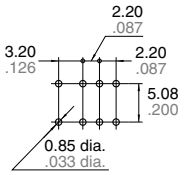
CAD Data



External dimensions



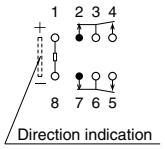
PC board pattern



Tolerance: ±0.1 ±.004

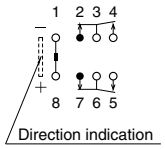
Schematic (Bottom view)

Single side stable
High sensitivity
single side stable



(Deenergized condition)

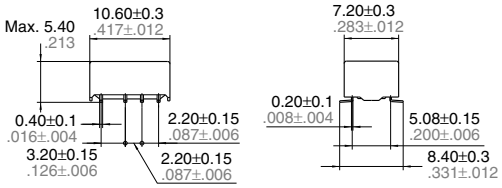
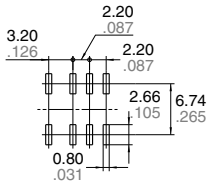
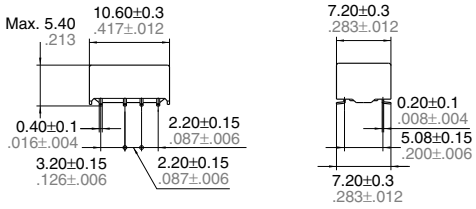
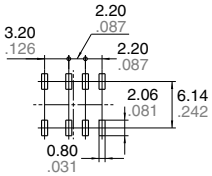
1 coil latching



(Reset condition)

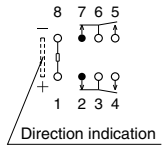
2. Surface-mount terminal

CAD Data

Type	External dimensions	Suggested mounting pad (Tolerance: ±0.1 ±.004)
	Single side stable/1 coil latching/High sensitivity single side stable	Single side stable/1 coil latching/High sensitivity single side stable
A type		
S type		

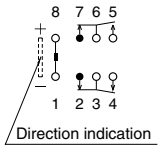
Schematic (Top view)

Single side stable
High sensitivity single side stable



(Deenergized condition)

1 coil latcing

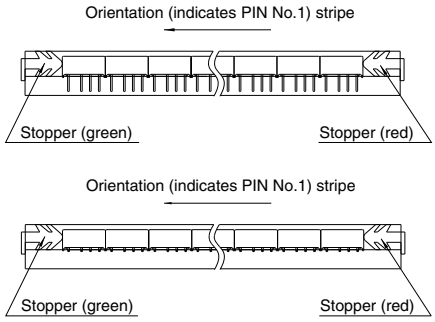


(Reset condition)

NOTES

1. Packing style

1) The relay is packed in a tube with the relay orientation mark on the left side, as shown in the figure below.

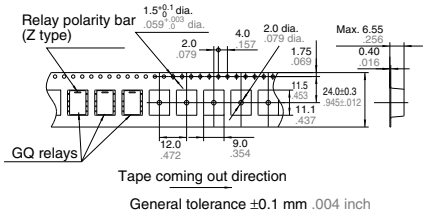


2) Tape and reel packing

(A type)

(1)-1 Tape dimensions

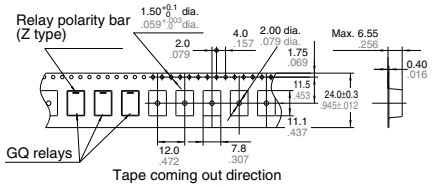
mm inch



General tolerance ±0.1 mm .004 inch

(S type)

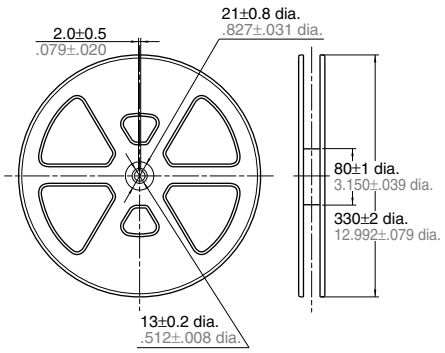
(1)-2 Tape dimensions



General tolerance ±0.1 mm .004 inch

(2) Dimensions of plastic peel

mm inch



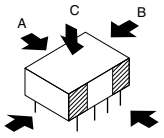
2. Automatic insertion

To maintain the internal function of the relay, the chucking pressure should not exceed the values below.

Chucking pressure in the direction A : 9.8 N {1 kgf} or less

Chucking pressure in the direction B : 9.8 N {1 kgf} or less

Chucking pressure in the direction C : 9.8 N {1 kgf} or less



Please chuck the ▨ portion.

Avoid chucking the center of the relay.

In addition, excessive chucking pressure to the pinpoint of the relay should be also avoided.

For general cautions for use, please refer to the "Cautions for use of Signal Relays" or "General Application Guidelines".

Please contact .....

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industrial.panasonic.com/ac/e/

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