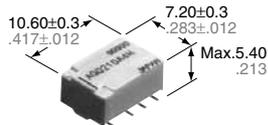
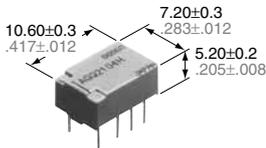


## ULTRA-SMALL PACKAGE FLAT POLARIZED RELAY

## GQ RELAYS (AGQ)

### FEATURES



mm inch

- **Compact flat body saves space**

With a small footprint of 10.6 mm (L) × 7.2 mm (W) .417 inch (L) × .283 inch (W) for space savings, it also has a very short height of 5.2 mm .205 inch. (Standard PC board type.)

- **Outstanding surge resistance.**

Surge withstand between open contacts: 1,500 V 10×160 μs (FCC part 68)  
Surge withstand between contacts and coil: 2,500 V 2×10 μs (Telcordia)

- **The use of twin crossbar contacts ensures high contact reliability.**

AgPd contact is used because of its good sulfide resistance. Adopting low-gas molding material. Coil assembly molding technology which avoids generating volatile gas from coil.

- **Increased packaging density**

Due to highly efficient magnetic circuit design, leakage flux is reduced and changes in electrical characteristics from components being mounted close-together are minimized. This all means a packaging density higher than ever before.

- **Nominal operating power: 140 mW**
- **Outstanding vibration and shock resistance.**

Functional shock resistance: 750 m/s<sup>2</sup> {75G}

Destructive shock resistance: 1,000 m/s<sup>2</sup> {100G}

Functional vibration resistance: 10 to 55 Hz (at double amplitude of 3.3 mm .130 inch)

Destructive vibration resistance: 10 to 55 Hz (at double amplitude of 5 mm .197 inch)

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

## SPECIFICATIONS

### Contact

Arrangement	2 Form C	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	100 mΩ	
Contact material	Stationary: AgPd+Au clad Movable: AgPd	
Rating	Nominal switching capacity (resistive load)	1 A 30 V DC 0.3 A 125 V AC
	Max. switching power (resistive load)	30 W, 37.5 V A
	Max. switching voltage	110 V DC, 125 V AC
	Max. switching current	1 A
	Min. switching capacity (Reference value) <sup>#1</sup>	10 μA 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)
Expected life (min. operations)	Mechanical (at 180 cpm)	5 × 10 <sup>7</sup>
	Electrical (at 20 cpm)	1 A 30 V DC resistive
		0.3 A 125 V AC resistive

### Remarks:

- \* Specifications will vary with foreign standards certification ratings.
- \*1 Measurement at same location as "Initial breakdown voltage" section.
- \*2 Detection current: 10mA.
- \*3 Nominal voltage applied to the coil, excluding contact bounce time.
- \*4 By resistive method, nominal voltage applied to the coil; contact carrying current: 1 A.
- \*5 Half-wave pulse of sine wave: 6 ms; detection time: 10μs.
- \*6 Half-wave pulse of sine wave: 6 ms.
- \*7 Detection time: 10μs.
- \*8 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

### Characteristics

Initial insulation resistance*1	Min. 1,000MΩ (at 500V DC)	
Initial breakdown voltage*2	Between open contacts	750 Vrms for 1min.
	Between contact sets	1,000 Vrms for 1min.
	Between contacts and coil	1,500 Vrms for 1min.
Initial surge voltage	Between open contacts (10×160 μs)	1,500 V(FCC Part 68)
	Between contacts and coil (2×10 μs)	2,500 V(Telcordia)
Operate time [Set time]*3 (at 20°C)	Max. 4 ms (Approx. 2 ms) [Max. 4 ms (Approx. 2 ms)]	
Release time (without diode) [Reset time]*3 (at 20°C)	Max. 4 ms (Approx. 1 ms) [Max. 4 ms (Approx. 2 ms)]	
Temperature rise*4 (at 20°C)	Max. 50°C	
Shock resistance	Functional*5	Min. 750 m/s <sup>2</sup> {75G}
	Destructive*6	Min. 1,000 m/s <sup>2</sup> {100G}
Vibration resistance	Functional*7	10 to 55 Hz at double amplitude of 3.3 mm
	Destructive	10 to 55 Hz at double amplitude of 5 mm
Conditions for operation, transport and storage*8 (Not freezing and condensing at low temperature)	Ambient temperature#2	-40°C to 85°C -40°F to 185°F
	Humidity	5 to 85% R.H.
Unit weight	Approx. 1 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 The upper limit for the ambient temperature is the maximum temperature that can satisfy the coil temperature rise. Under the packing condition, allowable temperature range is from -40 to +70°C -40° to +158°F.

## TYPICAL APPLICATIONS

- Communications (XDSL, Transmission)
- Measurement
- Security
- Home appliances, and audio/visual equipment
- Automotive equipment
- Medical equipment

## ORDERING INFORMATION

Ex. AGQ 2 0 0 A 1 H Z

Contact arrangement	Operating function	Type of operation	Terminal shape	Coil voltage (DC)		Packing style
2: 2 Form C	0: Single side stable 1: 1 coil latching	0: Standard type (B.B.M.)	Nil: Standard PC board terminal A: Surface-mount terminal A type S: Surface-mount terminal S type	1H: 1.5V 03: 3V 4H: 4.5V 06: 6V	09: 9V 12: 12V 24: 24V	Nil: Tube packing Z: Tape and reel packing (picked from 5/6/7/8 pin side)

Note: 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. Suffix "X" instead of "Z".

## TYPES AND COIL DATA (at 20°C 68°F)

### (1) Standard PC board terminal

Operating Function	Part No.	Coil Rating, V DC	Pick-up voltage, V DC (max.) (initial)	Drop-out voltage, V DC (min.) (initial)	Nominal operating current, mA (±10%)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
	Standard PC board terminal							
Single side stable	AGQ2001H	1.5	1.13	0.15	93.8	16	140	2.25
	AGQ20003	3	2.25	0.3	46.7	64.2	140	4.5
	AGQ2004H	4.5	3.38	0.45	31	145	140	6.75
	AGQ20006	6	4.5	0.6	23.3	257	140	9
	AGQ20009	9	6.75	0.9	15.5	579	140	13.5
	AGQ20012	12	9	1.2	11.7	1,028	140	18
	AGQ20024	24	18	2.4	9.6	2,504	230	28.8
Operating Function	Part No.	Coil Rating, V DC	Set voltage, V DC (max.) (initial)	Reset voltage, V DC (max.) (initial)	Nominal operating current, mA (±10%)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
	Standard PC board terminal							
1 coil latching	AGQ2101H	1.5	1.13	1.13	66.7	22.5	100	2.25
	AGQ21003	3	2.25	2.25	33.3	90	100	4.5
	AGQ2104H	4.5	3.38	3.38	22.2	202.5	100	6.75
	AGQ21006	6	4.5	4.5	16.7	360	100	9
	AGQ21009	9	6.75	6.75	11.1	810	100	13.5
	AGQ21012	12	9	9	8.3	1,440	100	18
	AGQ21024	24	18	18	5.0	4,800	120	36

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

2) Specified value of pick-up, drop-out, set and reset voltage is with the condition of square wave coil pulse.

### (2) Surface-mount terminal

Operating Function	Part No.		Coil Rating, V DC	Pick-up voltage, V DC (max.) (initial)	Drop-out voltage, V DC (min.) (initial)	Nominal operating current, mA (±10%)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
	Tube packing	Tape and reel packing							
Single side stable	AGQ200○1H	AGQ200○1HZ	1.5	1.13	0.15	93.8	16	140	2.25
	AGQ200○03	AGQ200○03Z	3	2.25	0.3	46.7	64.2	140	4.5
	AGQ200○4H	AGQ200○4HZ	4.5	3.38	0.45	31	145	140	6.75
	AGQ200○06	AGQ200○06Z	6	4.5	0.6	23.3	257	140	9
	AGQ200○09	AGQ200○09Z	9	6.75	0.9	15.5	579	140	13.5
	AGQ200○12	AGQ200○12Z	12	9	1.2	11.7	1,028	140	18
	AGQ200○24	AGQ200○24Z	24	18	2.4	9.6	2,504	230	28.8

○: For each surface-mounted terminal variation, input the following letter.

A type: A, S type: S

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

Tape and reel: 900 pcs.; Case: 1,800 pcs.

2) Specified value of pick-up, drop-out, set and reset voltage is with the condition of square wave coil pulse.

# GQ (AGQ)

Operating Function	Part No.		Coil Rating, V DC	Set voltage, V DC (max.) (initial)	Reset voltage, V DC (max.) (initial)	Nominal operating current, mA ( $\pm 10\%$ )	Coil resistance, $\Omega$ ( $\pm 10\%$ )	Nominal operating power, mW	Max. allowable voltage, V DC
	Tube packing	Tape and reel packing							
1 coil latching	AGQ21001H	AGQ21001HZ	1.5	1.13	1.13	66.7	22.5	100	2.25
	AGQ210003	AGQ210003Z	3	2.25	2.25	33.3	90	100	4.5
	AGQ21004H	AGQ21004HZ	4.5	3.38	3.38	22.2	202.5	100	6.75
	AGQ210006	AGQ210006Z	6	4.5	4.5	16.7	360	100	9
	AGQ210009	AGQ210009Z	9	6.75	6.75	11.1	810	100	13.5
	AGQ210012	AGQ210012Z	12	9	9	8.3	1,440	100	18
	AGQ210024	AGQ210024Z	24	18	18	5.0	4,800	120	36

○: For each surface-mounted terminal variation, input the following letter.

A type: A, S type: S

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

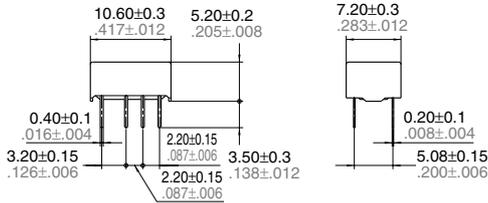
Tape and reel: 900 pcs.; Case: 1,800 pcs.

2) Specified value of pick-up, drop-out, set and reset voltage is with the condition of square wave coil pulse.

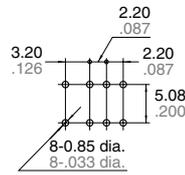
## DIMENSIONS

mm inch

### 1. PC board terminal

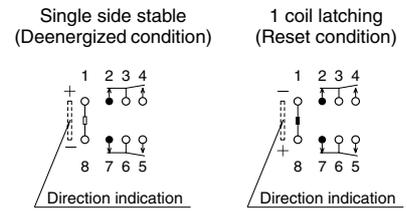


### PC board pattern



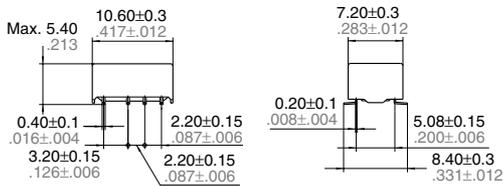
Tolerance:  $\pm 0.1 \pm 0.004$

### Schematic (Bottom view)



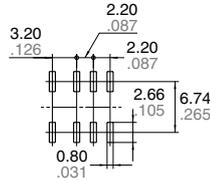
### 2. Surface-mount terminal

#### 1) A type

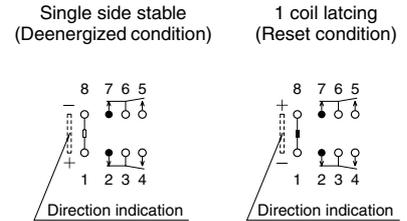


### Suggested mounting pad

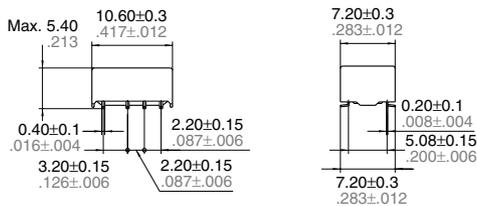
#### Single side stable/ 1 coil latching



### Schematic (Top view)

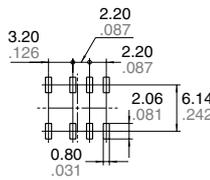


#### 1) S type



### Suggested mounting pad

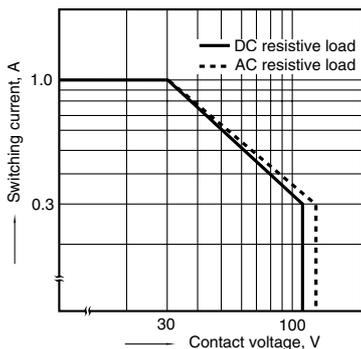
#### Single side stable/ 1 coil latching



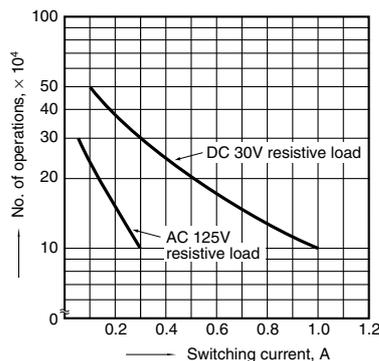
Tolerance:  $\pm 0.1 \pm 0.004$

## REFERENCE DATA

### 1. Max. switching capacity



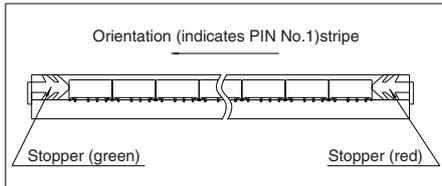
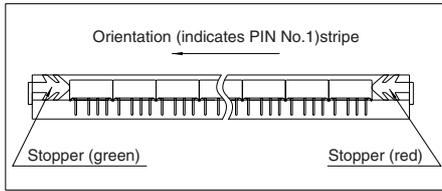
### 2. Life curve



**NOTES**

**1. Packing style**

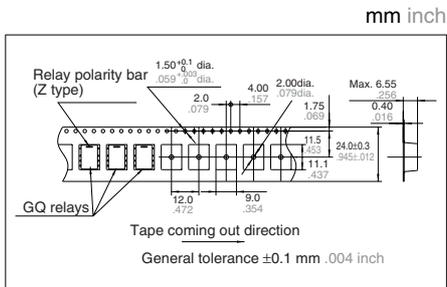
1) The relay is packed in a tube with the relay orientation mark on the left side, as shown in the figure below.



**2) Tape and reel packing**

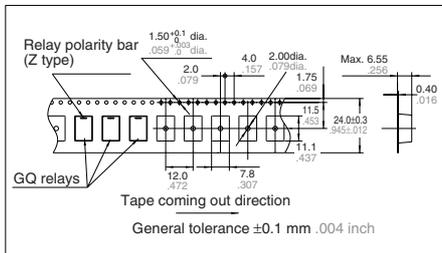
**(A type)**

**(1)-1 Tape dimensions**

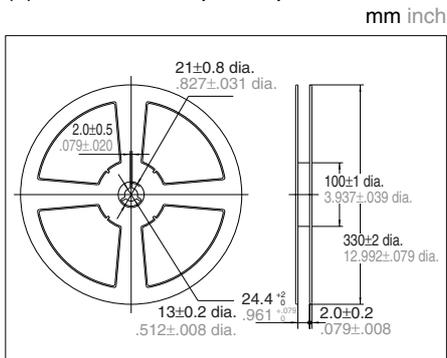


**(S type)**

**(1)-2 Tape dimensions**



**(2) Dimensions of plastic peel**



**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 :

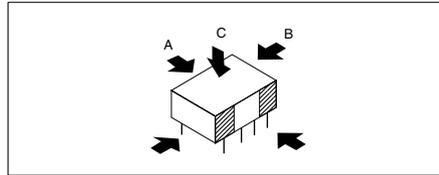
9.8 N {1 kgf} or less

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 Cautions for Use, see Relay Technical Information.**