

## Middle Power PCB Relay for Automotive and DC 12 V/24 V Applications

## G8G Relay

## Middle Load Relay for Motor/Heater Control Applications

- Can replace Micro ISO Plug-in type relay
- Small size & High heat resistance enable for usage in engine room
- Can support 40 A Fuse
- PIP reflow compliant
- Temperature range -40°C to +125°C
- DC24V Model for the applications of commercial vehicle also available



## Model Number Legend

G8G-□□□□  
1 2 3 4

## 1. Number of Contact Poles/Structure

1A: SPST (1 Form A)

1 : SPDT (1 Form C)

## 2. Protective structure

Blank or 4: Plastic sealed (RT III IEC61810)

7 : Flux tight (Open vent hole) (RT II IEC61810)

## 3. Characteristics

Blank: Standard

S : Low operating voltage

## 4. Special function

R: Pin in paste compliant type

V: DC24V Model

## Application Examples

- DC motor/resistive application control
- Automotive DC applications (Smart Junction Box, Blower fan, PTC heater, Seat heater, Power for accessory, A/C magnet clutch, Motor control for Commercial vehicle, etc.)

## Ordering Information

| Classification        | Contact form  | Protective structure                         | Rated coil voltage (V) | Model                 | Minimum Packing unit (Tube packing)     |
|-----------------------|---------------|----------------------------------------------|------------------------|-----------------------|-----------------------------------------|
| Standard              | SPST 1 Form A | Flux tight (open vent hole) (RT II IEC61810) | DC12                   | <b>G8G-1A7R DC12</b>  | 1920 pcs. / box<br>(64 pcs. × 30 tubes) |
|                       | SPDT 1 Form C |                                              |                        | <b>G8G-17R DC12</b>   |                                         |
| Low operation voltage | SPST 1 Form A |                                              |                        | <b>G8G-1A7SR DC12</b> |                                         |
|                       | SPDT 1 Form C |                                              |                        | <b>G8G-17SR DC12</b>  |                                         |
| DC24V Model           | SPDT 1 Form C | Plastic sealed (RT III IEC61810)             | DC24                   | <b>G8G-1SV DC24</b>   |                                         |

**Note.** Above models are not certificated for the safety standards of UL or CSA, etc.

## Ratings

## ●Coil

| Rated voltage (V) | Rated current (mA) | Coil resistance (Ω) | Must-operate voltage (V) | Must-release voltage (V) | Permissible voltage Range (V) | Rated Power consumption (mW) | Model          |
|-------------------|--------------------|---------------------|--------------------------|--------------------------|-------------------------------|------------------------------|----------------|
| DC12              | 40.0               | 300                 | 6.5 Max.                 | 0.5 Min.                 | 10 to 16                      | 480                          | G8G-1A7R DC12  |
|                   |                    |                     |                          |                          |                               |                              | G8G-17R DC12   |
|                   | 53.3               | 225                 | 5.5 Max.                 |                          |                               | 640                          | G8G-1A7SR DC12 |
|                   |                    |                     |                          |                          |                               |                              | G8G-17SR DC12  |
| DC24              | 106.7              | 225                 | 14.4 Max.                | 1 Min.                   | 18.2 to 32                    | 2560                         | G8G-1SV DC24   |

**Note 1.** The rated current and coil resistance are measured at a coil temperature of 20°C with a tolerance of ±10%.

**Note 2.** The operating characteristics are measured at a coil temperature of 20°C.

## ●Contacts

| Item                     | Classification<br>Model | Standard                        | Low operating voltage           | DC24V Model                     |
|--------------------------|-------------------------|---------------------------------|---------------------------------|---------------------------------|
|                          |                         | G8G-1A7R DC12<br>G8G-17R DC12   | G8G-1A7SR DC12<br>G8G-17SR DC12 | G8G-1SV DC24                    |
| Contact material         |                         | Silver-alloy                    |                                 |                                 |
|                          | at 85°C                 | -                               | -                               | 5 A                             |
|                          | at 110°C                | 20 A                            | 15 A                            | -                               |
|                          | at 125°C                | 15 A                            | 10 A                            | -                               |
| Max. switching current   |                         | 84 A Inrush / 35 A Break (N.O.) |                                 | 20 A Inrush / 14 A Break (N.O.) |
| Max. carrying current *1 | 20 A fuse 200%          | -                               | -                               | 40 A at DC28V for 10 mins       |
|                          | 30 A slow fuse 135%     | 40.5 A at DC14V for 60 mins     |                                 | -                               |
|                          | 40 A blade fuse 135%    | 54 A at DC14V for 2 mins        |                                 | -                               |
| Min. switching current   |                         | DC12V, 1 A                      |                                 |                                 |

\*1. The value is applicable at an ambient temperature 20°C. This does not guarantee repeated condition. Also depends on the connecting conditions. Please contact our sales representative if you have specific conditions.

## ■Characteristics

| Item                            |                                       | G8G-1A7R DC12<br>G8G-17R DC12                                             | G8G-1A7SR DC12<br>G8G-17SR DC12 | G8G-1SV DC24                                                           |
|---------------------------------|---------------------------------------|---------------------------------------------------------------------------|---------------------------------|------------------------------------------------------------------------|
| Contact resistance (See *1.)    |                                       | Typ.3.0 mΩ max.20 mΩ                                                      |                                 |                                                                        |
| Operate time                    |                                       | 10 ms max.<br>(DC12V not including bounce time)                           |                                 | 10 ms max.<br>(DC24V not including bounce time)                        |
| Release time                    |                                       | 5 ms max.<br>(DC12V not including bounce time)                            |                                 | 5 ms max.<br>(DC24V not including bounce time)                         |
| Insulation resistance (See *2.) | Between coil and contacts             | 100 MΩ min.                                                               |                                 |                                                                        |
|                                 | Between contacts of the same polarity | 100 MΩ min.                                                               |                                 |                                                                        |
| Dielectric strength             | Between coil and contacts             | AC500V 1 min                                                              |                                 |                                                                        |
|                                 | Between contacts of the same polarity | AC500V 1 min                                                              |                                 |                                                                        |
| Vibration resistance            | Destruction                           | 33 Hz, 45 m/s <sup>2</sup>                                                |                                 |                                                                        |
|                                 | Malfunction                           | 10 to 200 Hz, 45 m/s <sup>2</sup> (detection time: 10 μs)                 |                                 |                                                                        |
| Shock resistance                | Destruction                           | 1,000 m/s <sup>2</sup> (pulse duration: 6 ms)                             |                                 |                                                                        |
|                                 | Malfunction                           | 100 m/s <sup>2</sup> (pulse duration: 11 ms detection time: 10 μs)        |                                 |                                                                        |
| Mechanical endurance (See *3.)  |                                       | 1,000,000 ops. min.                                                       |                                 |                                                                        |
| Electrical endurance (See *4.)  | Resistive Load                        | DC14V, N.O. 35 A / N.C. 15 A,<br>1.0 s ON/9.0 s OFF, 100,000 ops.         |                                 | DC28V, N.O. 14 A / N.C. 5 A,<br>1.0 s ON/1.0 s OFF, 100,000 ops.       |
|                                 | Lamp Load                             | DC14V, 84 A Inrush / 12 A Break,<br>1.0 s ON/9.0 s OFF, 100,000 ops.      |                                 | DC28V, 20 A Inrush / 2 A Steady,<br>1.0 s ON/1.2 s OFF, 100,000 ops.   |
|                                 | Motor Load                            | DC14V, 32 A, 0.25 mH, Motor locked,<br>0.25 s ON/9.75 s OFF, 100,000 ops. |                                 | DC28V, 12 A, 3 mH, Motor locked,<br>0.25 s ON/4.75 s OFF, 100,000 ops. |
| Ambient operating temperature   |                                       | -40 to 125°C<br>(without freezing or condensation)                        |                                 | -40 to 85°C<br>(without freezing or condensation)                      |
| Ambient operating humidity      |                                       | 35% to 85% RH                                                             |                                 |                                                                        |
| Weight                          |                                       | Approx. 5.2 g                                                             |                                 | Approx. 6.0 g                                                          |

**Note.** The above values are initial values at an ambient temperature of +20°C unless otherwise specified.

\*1. The contact resistance was measured with 1 A at DC5V using the voltage drop method.

\*2. The insulation resistance was measured with a DC500V megohmmeter.

\*3. The mechanical endurance was measured at a switching frequency of 18,000 operations/hr.

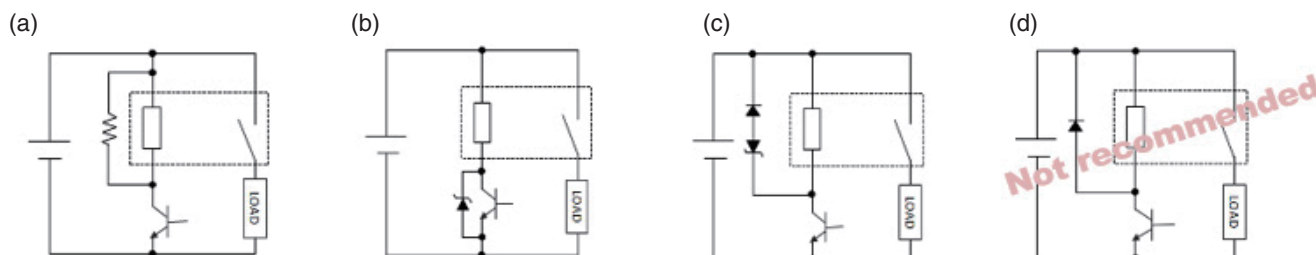
\*4. Please connect N.O. terminal to the +BATT side on Electrical use and connect surge suppression element in parallel with between coil based on recommended circuit.

Recommended circuit: (a), (b), (c)

Not-recommended circuit: (d)

Note:

OMRON recommends coil driver circuit (b) and (c) for coil surge suppression. However the circuit (d) is not recommended because it may negatively affect the durability performance.

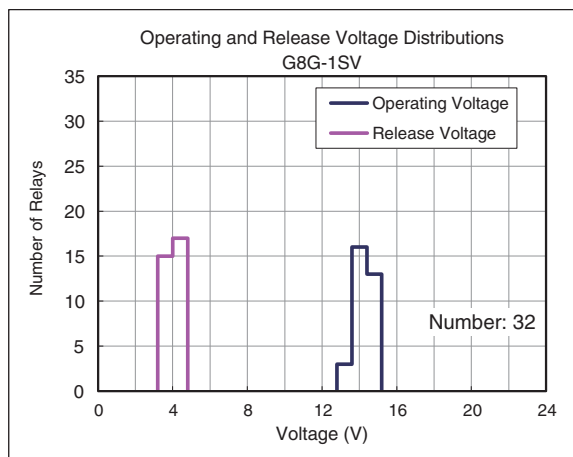
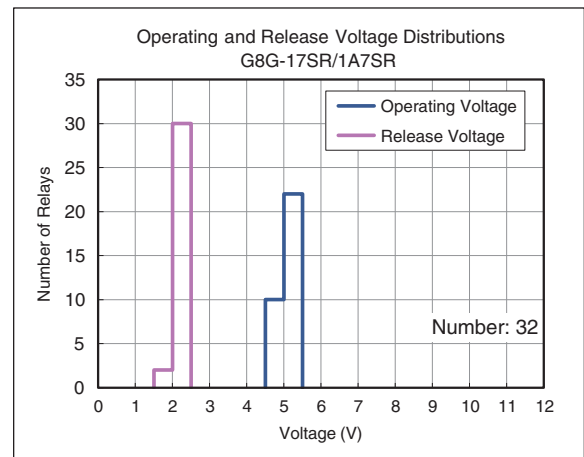
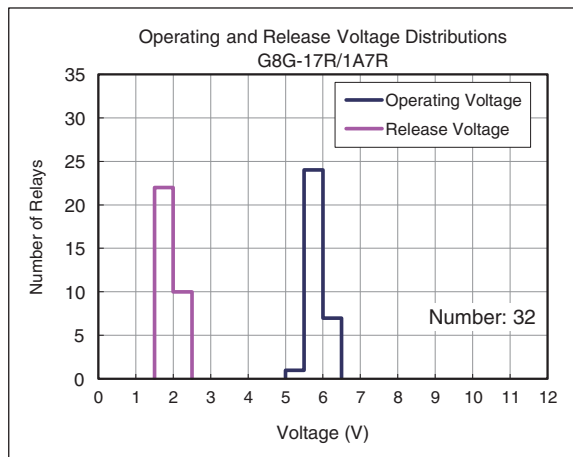


## Reference Technical Data

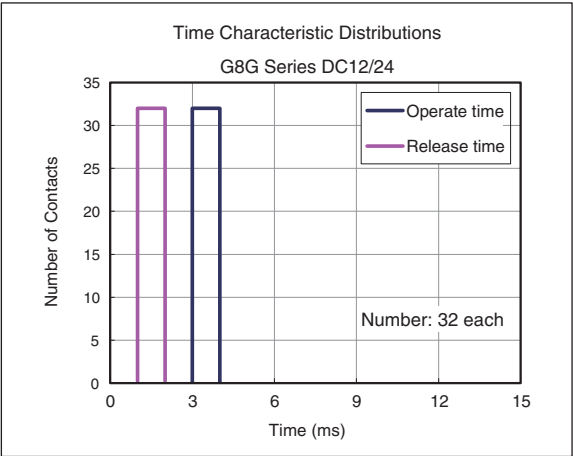
### Actual Electrical performance (reference)

| Model         | Application    | Load voltage | Inrush | Steady state | Switching off | Inductance | Ambient temperature | Switching frequency |         | Required Cycles (min) |
|---------------|----------------|--------------|--------|--------------|---------------|------------|---------------------|---------------------|---------|-----------------------|
|               |                | (V)          | (A)    | (A)          | (A)           |            |                     | On (s)              | Off (s) | Total                 |
| G8G-17R DC12  | N.O. Inductive | 14           | 60     | 12           |               | 0.5        | -40°C to +125°C     | 3.0                 | 5.0     | 250,000               |
| G8G-17R DC12  | Wiper On Off   | 14           | 32.4   | 4.33         | 22            | 1          | -40°C to +105°C     | 2.0                 | 2.0     | 700,000               |
| G8G-1A7R DC12 | Blower Fan     | 14           | 46.6   | 22           |               | 0.5        | -40°C to +85°C      | 3.0                 | 5.0     | 150,000               |
| G8G-1A7R DC12 | A/C clutch     | 14           | 3.8    | 3.8          |               | 14         | -40°C to +110°C     | 1.0                 | 1.0     | 2,000,000             |
| G8G-1SV DC24  | Motor lock     | 28           |        |              | 12            | 3          | 25                  | 0.25                | 4.75    | 100,000               |
| G8G-1SV DC24  | Motor free     | 28           | 15     | 2.5          |               | 0.25       | 25                  | 1.0                 | 4.0     | 100,000               |
| G8G-1SV DC24  | N.O. Resistive | 28           |        | 14           |               |            | 25                  | 1.0                 | 1.0     | 100,000               |
| G8G-1SV DC24  | N.C. Resistive | 28           |        | 5            |               |            | 25                  | 1.0                 | 1.0     | 100,000               |
| G8G-1SV DC24  | N.O. Lamp      | 28           | 20     | 2            |               |            | 25                  | 1.0                 | 1.2     | 100,000               |

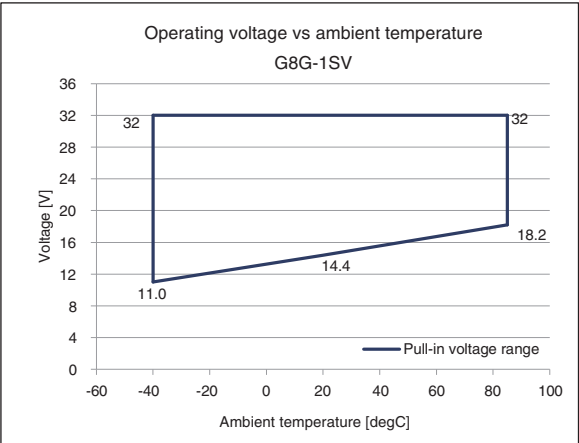
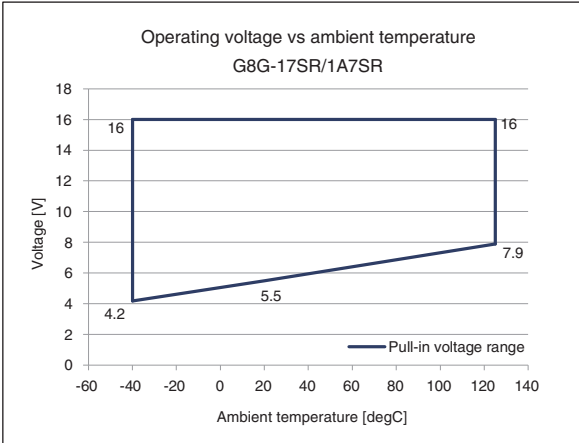
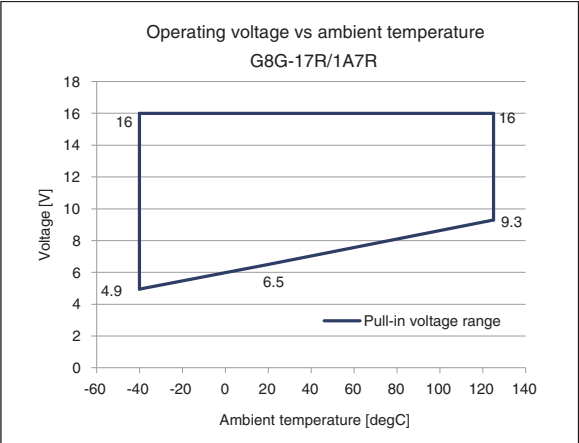
### Operating Voltage and Release Voltage Distributions (Number of Relays × Percentage of Rated Voltage)



●Time Characteristic Distributions  
(Number of Contacts × Time (ms))

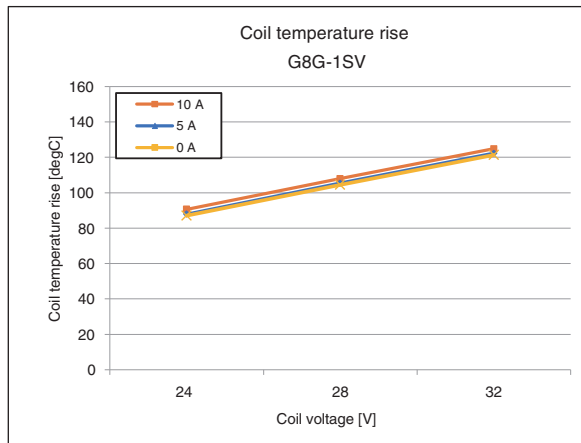
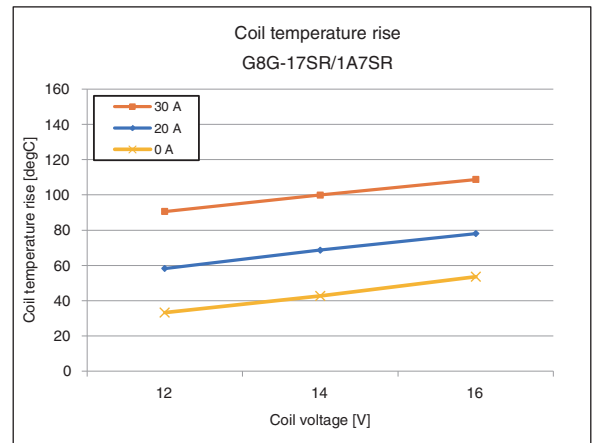
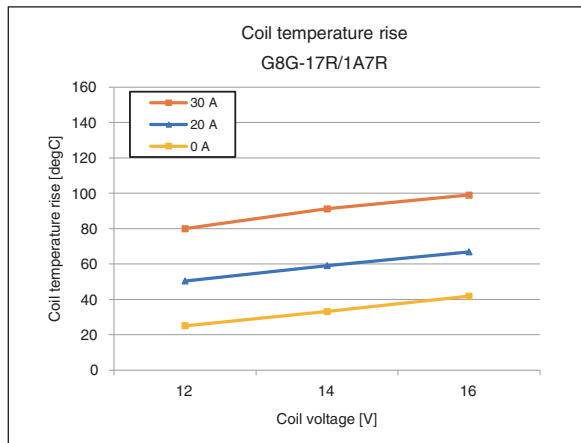


●Operating voltage vs ambient temperature (Cold start)

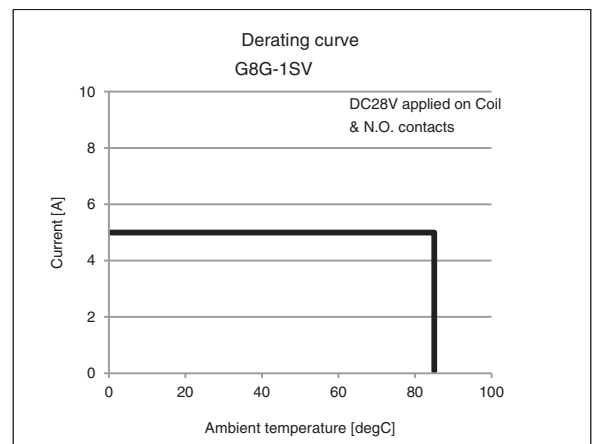
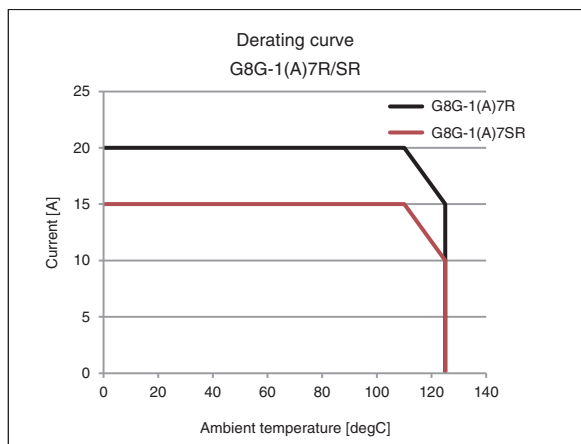


### ●Coil temperature rise [degC] at 20°C

(For using under a higher ambient temperature, please select the proper current carrying condition to avoid a possible excessive temperature rising.)



### ●Derating curve

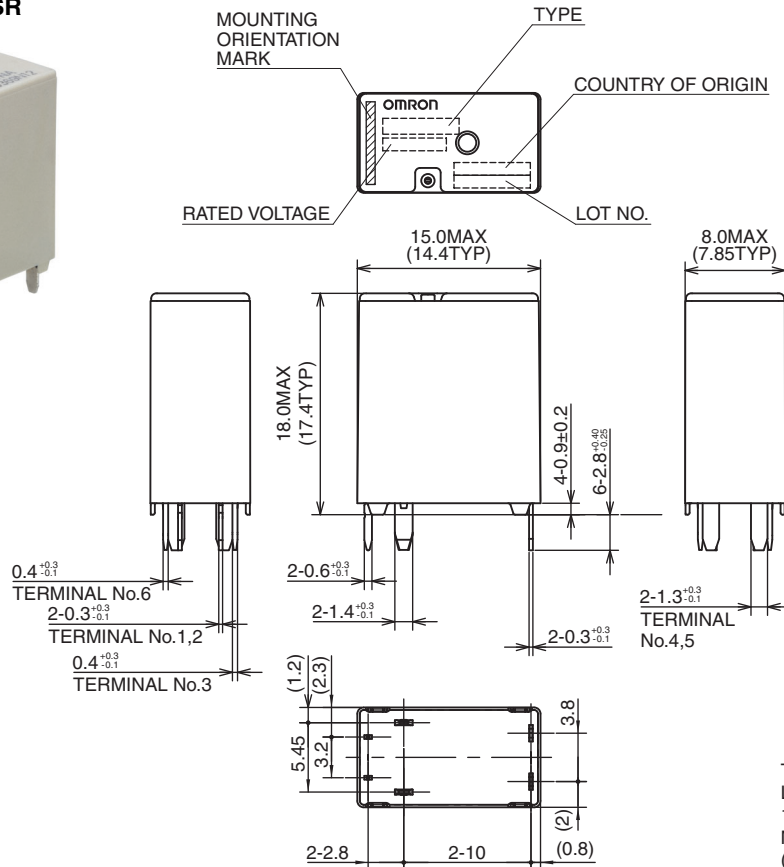


## ■Dimensions

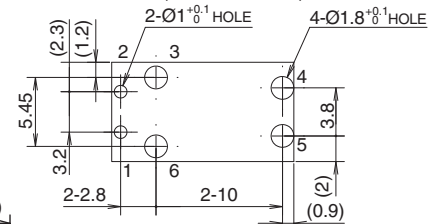
**CAD Data** Please visit our website, which is noted on the last page.

(Unit: mm)

### G8G-17R/17SR

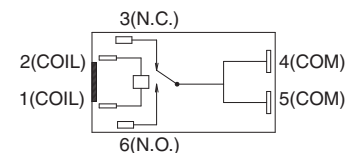


FOR REFERENCE : PCB MOUNTING HOLES (BOTTOM VIEW)



\*Please study & choose other appropriate hole diameters if confirmed the diameter values recommended above don't work with the soldering process.

TERMINAL ARRANGEMENT/  
INTERNAL CONNECTIONS  
(BOTTOM VIEW)



NOTE: \*TERMINAL 6 CONNECTS TO +BATT.

TOLERANCE UNLESS OTHERWISE SPECIFIED

Less than 1 mm : ±0.1 mm

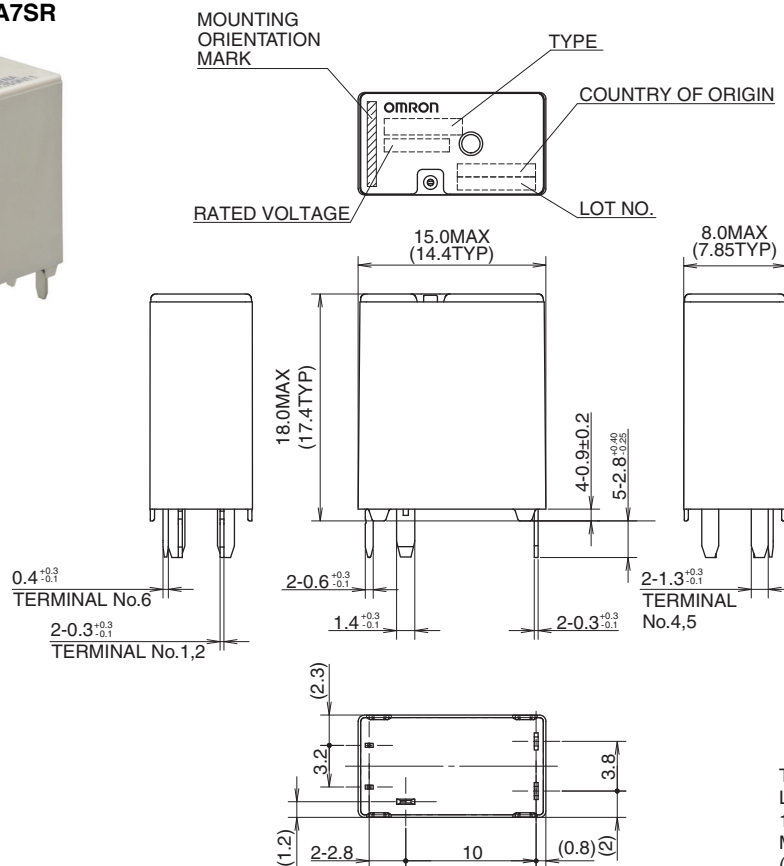
1 to 3 mm : ±0.2 mm

More than 3 mm : ±0.3 mm

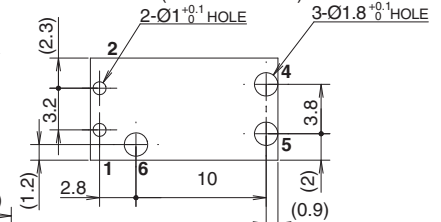
( ) is reference dimension

**CAD Data**

### G8G-1A7R/1A7SR

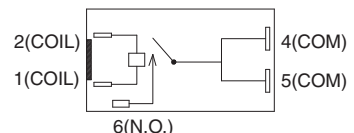


FOR REFERENCE : PCB MOUNTING HOLES (BOTTOM VIEW)



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TERMINAL ARRANGEMENT/  
INTERNAL CONNECTIONS  
(BOTTOM VIEW)



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TOLERANCE UNLESS OTHERWISE SPECIFIED

Less than 1 mm : ±0.1mm

1 to 3mm : ±0.2mm

More than 3mm : ±0.3mm

( ) is a reference dimension

**CAD Data**

(Unit: mm)

CAD Data

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## ■Precautions

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- Please refer to “Safety Precautions for All Automotive Relays” for correct use.

Please check each region's Terms & Conditions by region website.

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### OMRON Corporation

Device & Module Solutions Company

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