

# 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



**RoHS Compliant**

### 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 (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	<b>G8G-1A7R DC12</b> <b>G8G-17R DC12</b>
	53.3	225	5.5 Max.			640	<b>G8G-1A7SR DC12</b> <b>G8G-17SR DC12</b>
DC24	106.7	225	14.4 Max.	1 Min.	18.2 to 32	2560	<b>G8G-1SV DC24</b>

**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 Model	Standard	Low operating voltage	DC24V Model
		G8G-1A7R DC12 G8G-17R DC12	G8G-1A7SR DC12 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 G8G-17R DC12	G8G-1A7SR DC12 G8G-17SR DC12	G8G-1SV DC24
Contact resistance (See *1.)		Typ.3.0 mΩ max.20 mΩ (N.O)		
Operate time		10 ms max. (DC12V not including bounce time)		10 ms max. (DC24V not including bounce time)
Release time		5 ms max. (DC12V not including bounce time)		5 ms max. (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, 1.0 s ON/9.0 s OFF, 100,000 ops.		DC28V, N.O 14 A / N.C 5 A, 1.0 s ON/1.0 s OFF, 100,000 ops.
	Lamp Load	DC14V, 84 A Inrush / 12 A Break, 1.0 s ON/9.0 s OFF, 100,000 ops.		DC28V, 20 A Inrush / 2 A Steady, 1.0 s ON/1.2 s OFF, 100,000 ops.
	Motor Load	DC14V, 32 A, 0.25 mH, Motor locked, 0.25 s ON/9.75 s OFF, 100,000 ops.		DC28V, 12 A, 3 mH, Motor locked, 0.25 s ON/4.75 s OFF, 100,000 ops.
Ambient operating temperature		-40 to 125°C (without freezing or condensation)		-40 to 85°C (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 500 VDC megohmmeter.

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

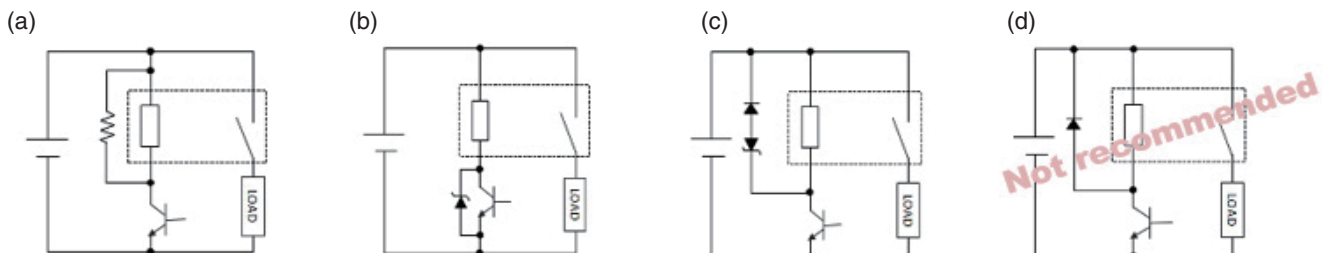
\*4. Please connect N.O terminal to the +BATT side on Electrical use and connect surge suppression element in parallel with between coil based on recommended circuit.

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.

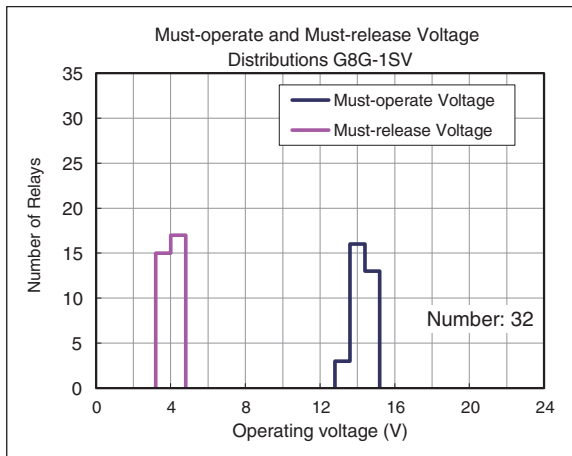
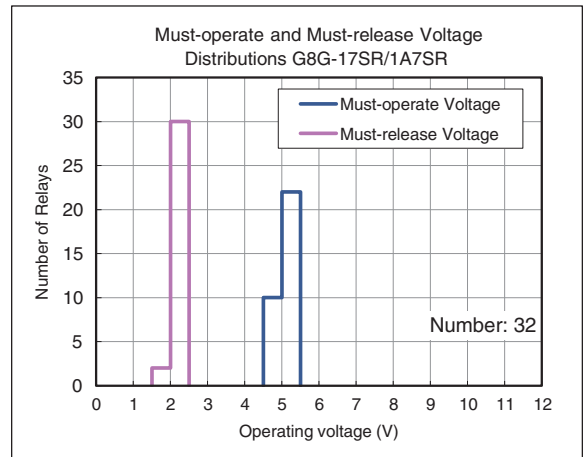
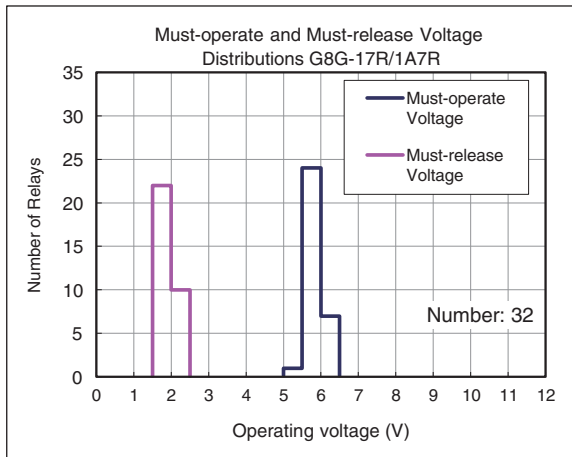


## Reference Technical Data

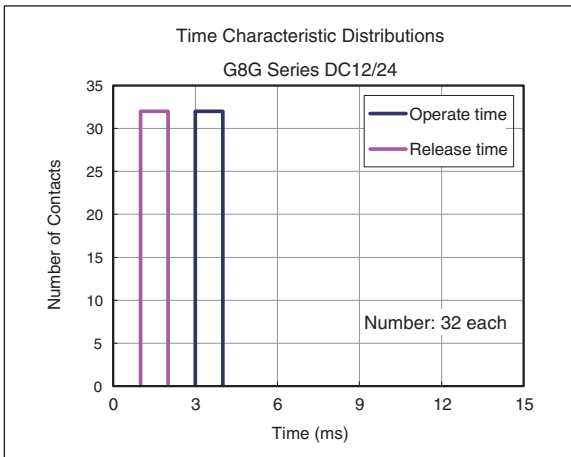
### Actual Electrical performance (reference)

Model	Application	Load voltage	Inrush	Steady state	Switching off	Inductance	Ambient temperature	Switching frequency		Required Cycles (min)
		(V)	(A)	(A)	(A)		(°C)	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.O 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

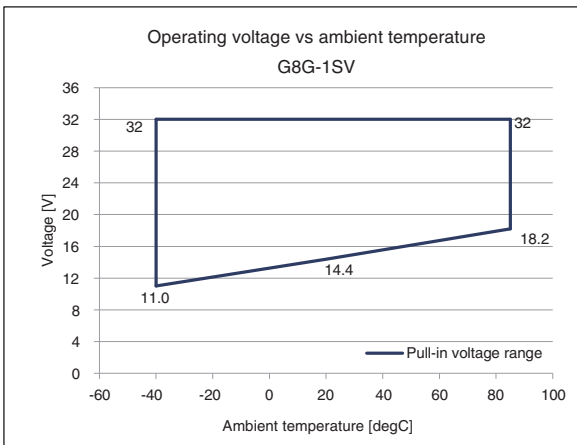
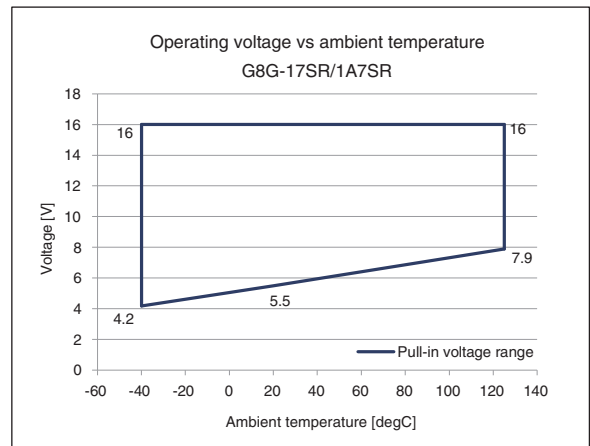
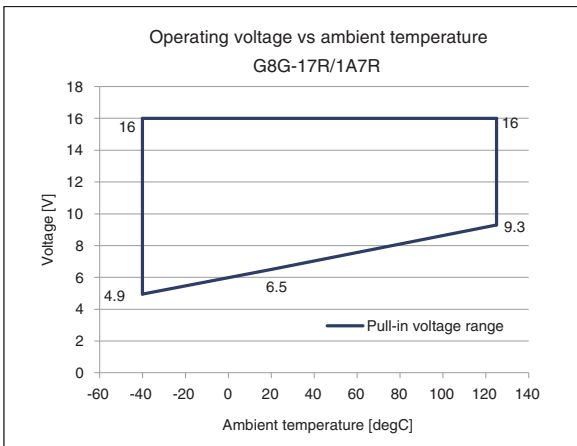
### Must-operate Voltage and Must-release Voltage Distributions (Number of Relays × Percentage of Rated Voltage)



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

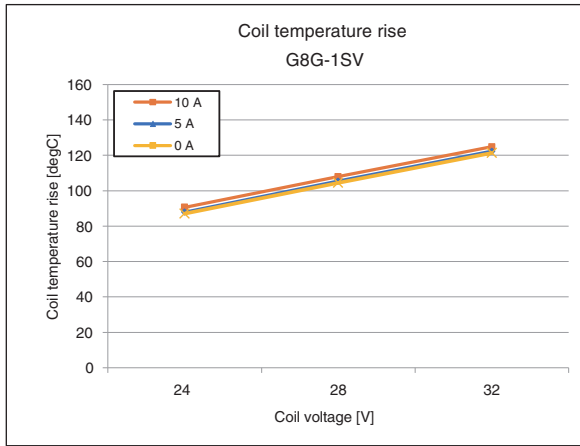
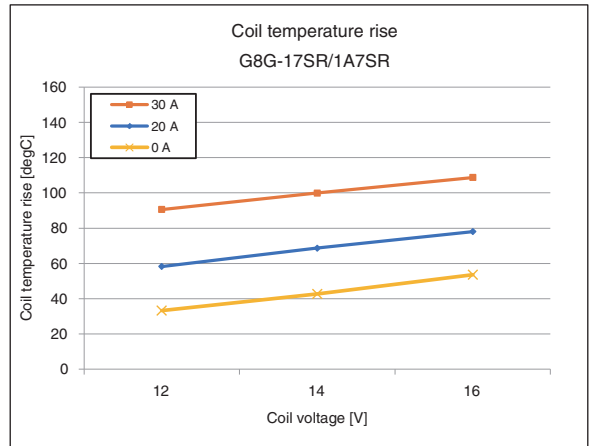
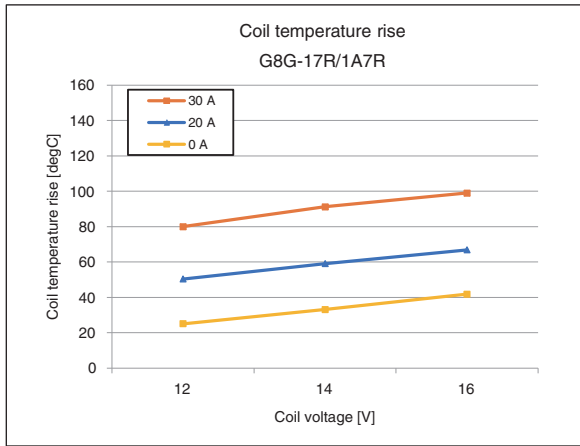


●Operating voltage vs ambient temperature (Cold start)

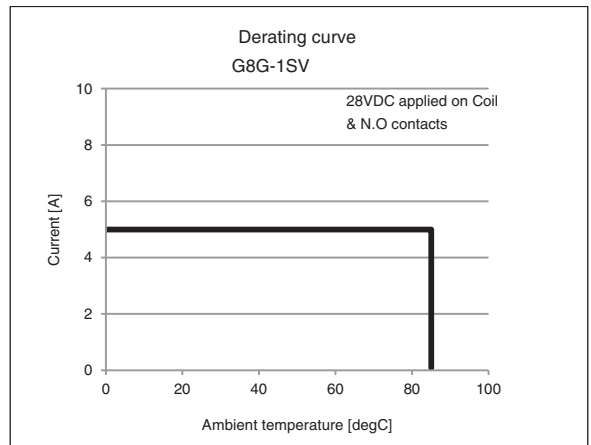
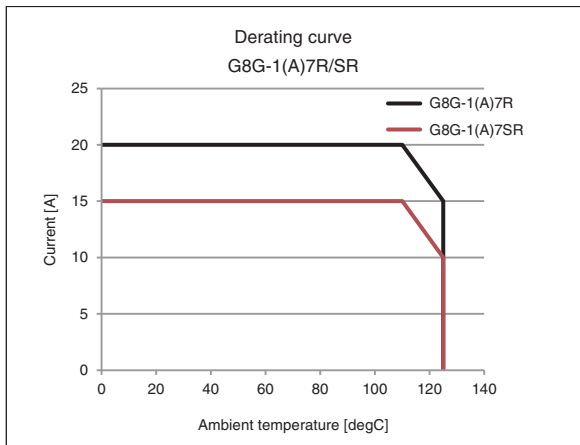


●Coil temperature rise [degC] at 20°C

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



●Derating curve

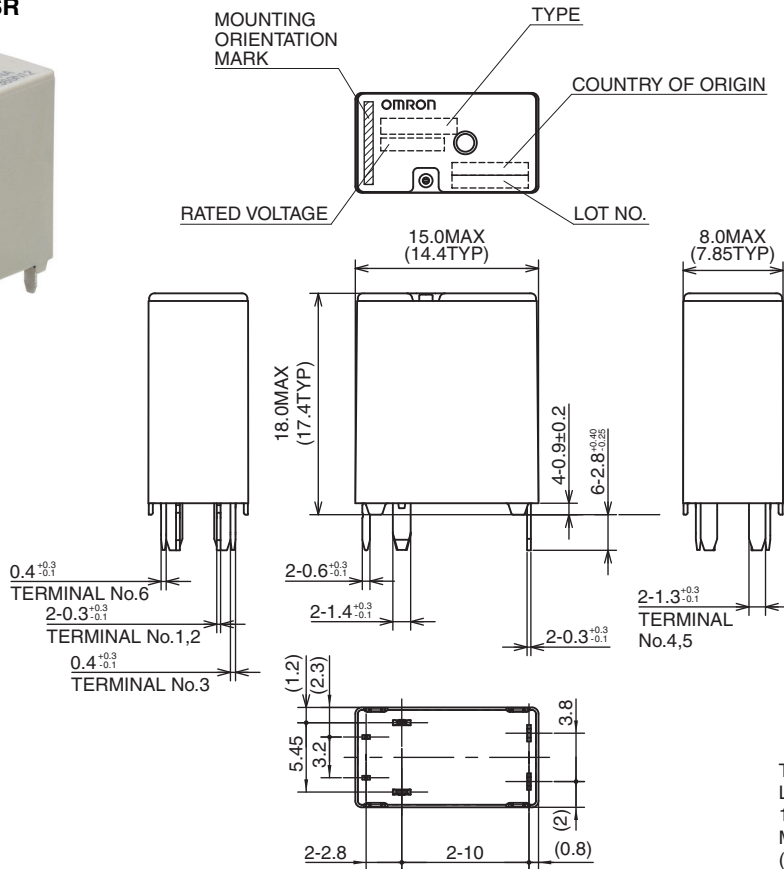


■ Dimensions

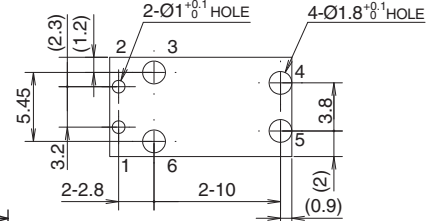
CAD Data Please visit our website, which is noted on the last page.

(Unit: mm)

G8G-17R/17SR

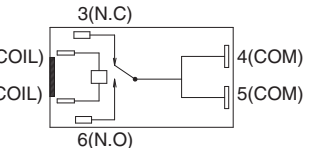


FOR REFERENCE : PCB MOUNTING HOLES (BOTTOM VIEW)



\*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

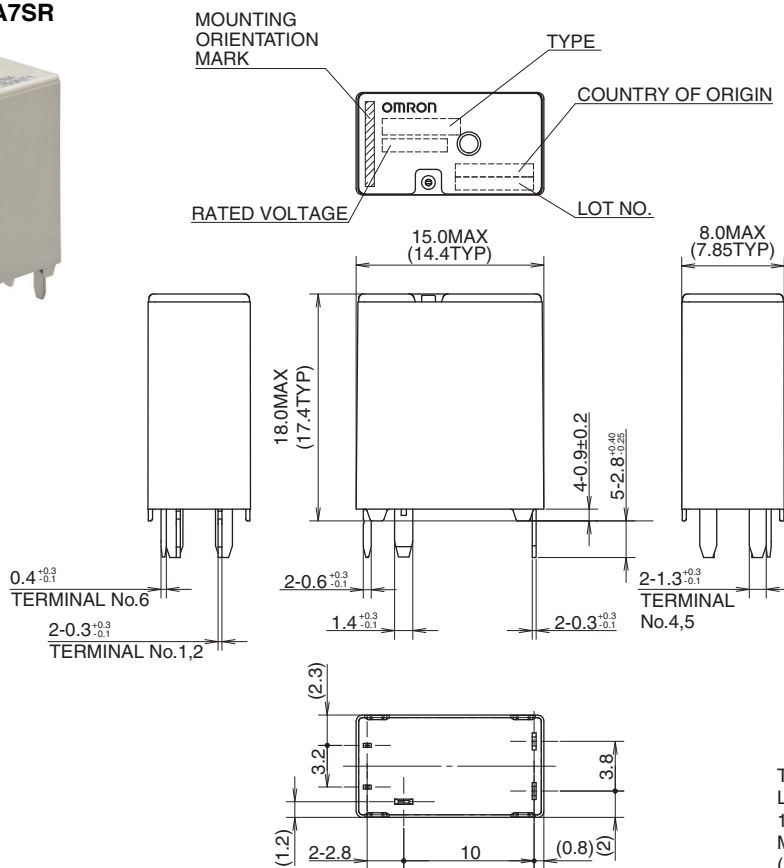
1 to 3 mm :±0.2 mm

More than 3 mm :±0.3 mm

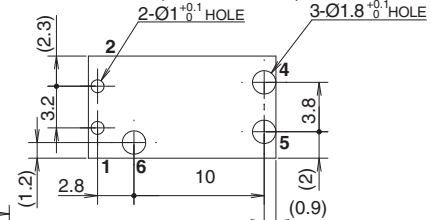
( ) is reference dimension

CAD Data

G8G-1A7R/1A7SR

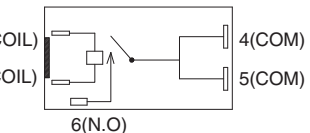


FOR REFERENCE : PCB MOUNTING HOLES (BOTTOM VIEW)



\*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 1mm :±0.1mm

1 to 3mm :±0.2mm

More than 3mm :±0.3mm

( ) is a reference dimension

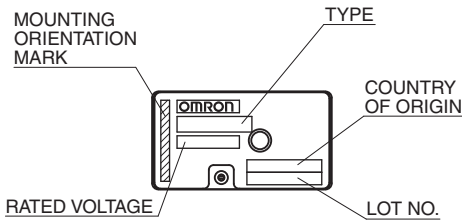
CAD Data

■ Dimensions

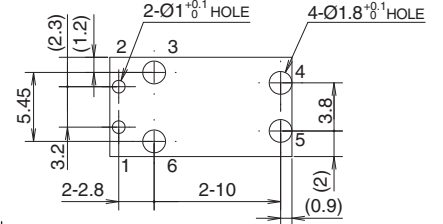
CAD Data Please visit our website, which is noted on the last page.

(Unit: mm)

G8G-1SV

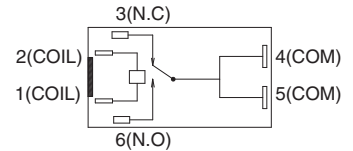


FOR REFERENCE : PCB MOUNTING HOLES (BOTTOM VIEW)

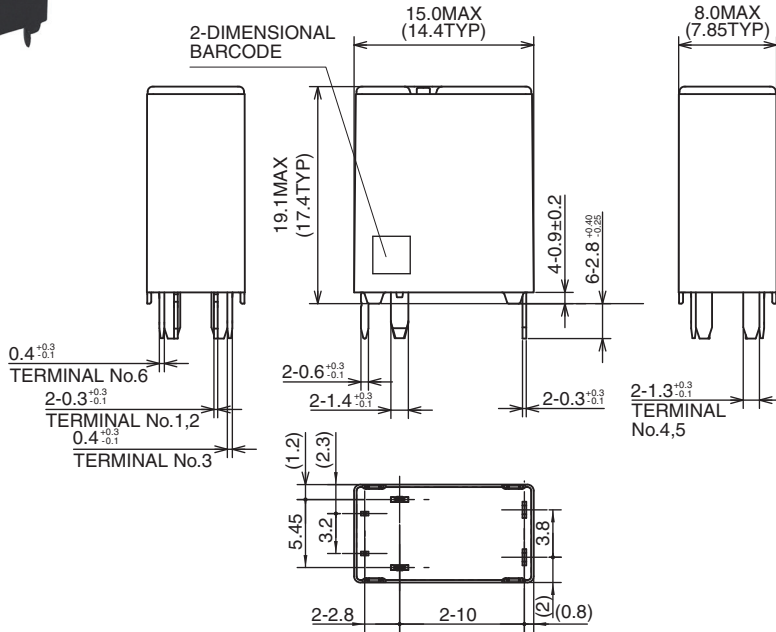


\*Please study & choose other appropriate hole diameters if confirmed the diameter values recommended above don't work with the soldering process.

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