

# Small Power H-bridge PCB Relay for Automotive and DC 12 V Applications

# G8NDL Relay

## Low Profile Low Load Relay with H-Bridge Circuit Inside for Motor Control Applications

- Low profile and can switch 14 V 25 A motor load
- H-Bridge circuit inside
- Pin in paste reflow compliant relay
- Temperature range -40°C to +125°C

**RoHS Compliant**



### Model Number Legend

G8NDL-          
           1 2 3 4

#### 1. Number of Contact Poles/Structure

2: SPDT x2 (1 Form C x2) H-bridge

#### 2. Protective structure

Blank: Plastic sealed (RT III IEC61810)

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

#### 3. Characteristics

Blank: Standard

H : Low power consumption

V : Ultralow power consumption

#### 4. Special function

Blank: Standard

R : Pin in paste reflow compliant

### Application Examples

- DC motor/resistance application control
- Automotive DC applications (Door lock, Power window, Sunroof, etc.)

### Ordering Information (For the shipment time & other information, please inquire the local distributor)

| Classification | Contact form                         | Protective structure                               | Rated coil  |                | Model                  | Characteristics            | Minimum Packing unit<br>(Tube packing)                 |
|----------------|--------------------------------------|--|-------------|----------------|------------------------|----------------------------|--|
|                |                                      |  | Voltage (V) | Resistance (Ω) |                        |                            |  |
| Twin           | SPDT x2<br>(1 Form C x2)<br>H-bridge | Plastic sealed<br>(RT III IEC61810)                | DC12        | 95             | <b>G8NDL-2 DC12</b>    | Standard                   | 40 pcs. / stick<br>36 sticks / box<br>Total 1,440 pcs. |
|                |                                      |  |             | 115            | <b>G8NDL-2H DC12</b>   | Low power consumption      |  |
|                |                                      |  |             | 135            | <b>G8NDL-2V DC12</b>   | Ultralow power consumption |  |
|                |                                      | Flux tight<br>(open vent hole)<br>(RT II IEC61810) |             | 95             | <b>G8NDL-27R DC12</b>  | Standard                   |  |
|                |                                      |  |             | 115            | <b>G8NDL-27HR DC12</b> | Low power consumption      |  |

**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                |                        |
|-------------------|--------------------|---------------------|--------------------------|--------------------------|-------------------------------|------------------------------|----------------------|------------------------|
|                   |                    |                     |                          |                          |                               |                              | Plastic sealed       | Flux tight             |
| DC12              | 126.3              | 95                  | 5.6 Max.                 | 0.9 Min.                 | 10 to 16                      | 1516                         | <b>G8NDL-2 DC12</b>  | <b>G8NDL-27R DC12</b>  |
|                   | 104.3              | 115                 | 5.9 Max.                 |                          |                               | 1252                         | <b>G8NDL-2H DC12</b> | <b>G8NDL-27HR DC12</b> |
|                   | 88.9               | 135                 | 6.5 Max.                 |                          |                               | 1067                         | <b>G8NDL-2V DC12</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 power consumption |                  | Ultralow power consumption |
|-------------------------------|----------------------|--------------------------------|-----------------------|------------------|----------------------------|
|                               |                      | G8NDL-2 DC12<br>G8NDL-27R DC12 | G8NDL-27HR DC12       | G8NDL-2H DC12    | G8NDL-2V DC12              |
| Contact material              |                      | Silver-alloy                   |                       |                  |                            |
| Max. switching current (N.O.) |                      | 30 A                           |                       |                  |                            |
| Max. carrying current *1      | at 20°C              | 5 A DC16V, 1 min               | 25 A DC12V, 2 mins    |                  |                            |
|                               | at 105°C             | 5 A DC16V, 1 min               | 10 A DC12V, 2 mins    | 5 A DC16V, 1 min |                            |
|                               | at 125°C             | -                              | 5 A DC12V, 2 mins     | -                |                            |
| Min. switching current        |                      | 1 A DC12V                      |                       |                  |                            |

\*1. This does not guarantee repeated condition, also depends on the connecting conditions. Please contact our sales representative if you have specific conditions.

■Characteristics

| Item                            | Standard value                                  |   |
|---------------------------------|---|---|
|                                 | Twin  |   |
| Contact resistance (See *1.)    | Typ. 5 mΩ Max. 50 mΩ                            |   |
| Operate time                    | 10 ms max. (DC12V not including bounce time)    |   |
| Release time                    | 5 ms max. (DC12V 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 400Hz, 45 m/s <sup>2</sup> (detection time: 10 μs)                |
| Shock resistance                | Destruction                                     | 1,000 m/s <sup>2</sup> (Pulse duration time: 6 ms)                      |
|                                 | Malfunction                                     | 100 m/s <sup>2</sup> (detection time: 10 μs, Pulse duration time: 11ms) |
| Mechanical endurance (See *3.)  | 1,000,000 ops. min.                             |   |
| Electrical endurance (See *4.)  | Motor Load                                      | 25 A DC14V, 0.33 mH, 0.25 s ON/9.75 s OFF, 100,000 operations           |
|                                 | Resistive Load                                  | 5 A DC14V, 1 s ON/1 s OFF, 100,000 operations                           |
| Ambient operating temperature   | -40 to 125°C (without freezing or condensation) |   |
| Ambient operating humidity      | 35% to 85% RH                                   |   |
| Weight                          | 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

\*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.

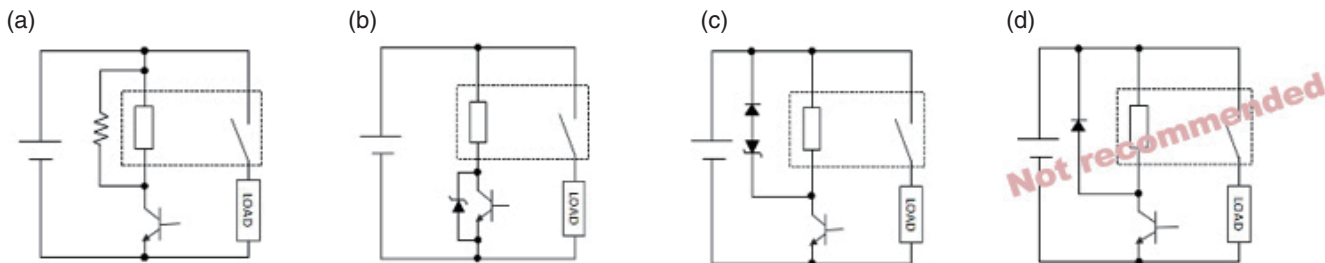
\*4. Please connect N.O. terminal to the +BATT side on Electrical use and connect surge suppression element in parallel with between coil based on recommended circuit.

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.

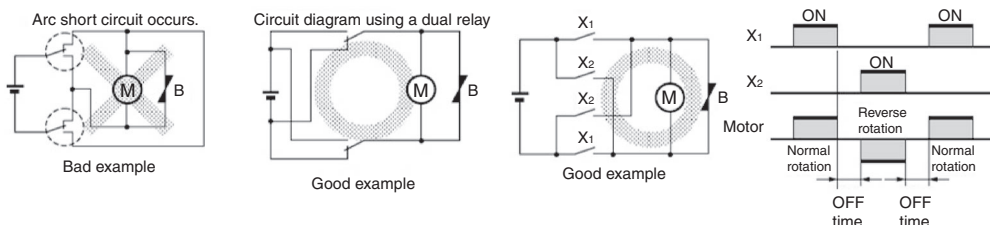


\*5. G8NDL-27HR supports the current-carrying under 125°C, other models support until 105°C.

Please refer to the condition of carrying current and derating curve if using under the maximum ambient temperature.

\*6. Motor Switching for Forward and Reverse Operation.

In the case of switching a motor for forward and reverse operation, two relays or a twin relay should be used (See the figure below). The interval between the energization of 2 relays should be 100ms minimum.

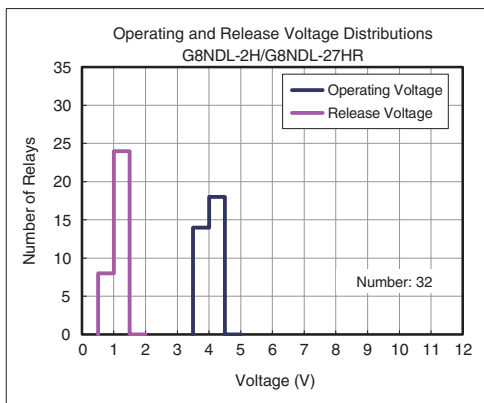


## Reference Technical Data

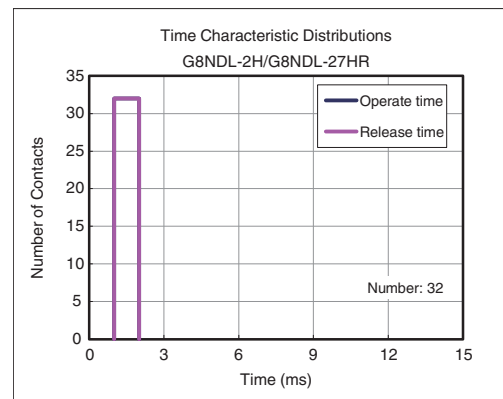
### Actual Electrical performance (reference)

| Model           | Application              | Load voltage | Inrush | Switching off | Inductance | Ambient temperature | Switching frequency |      | Required cycles (Min.) |
|-----------------|--------------------------|--------------|--------|---------------|------------|---------------------|---------------------|------|------------------------|
|                 |                          | (V)          | (A)    | (A)           |            |                     | (mH)                | (°C) | ON (s)                 |
| G8NDL-27R DC12  | Motor Lock               | 13.5         | 8      | 20            | 0.33       | -40 to 85           | 4                   | 15   | 100,000                |
| G8NDL-27R DC12  | Power Window Motor Lock  | 14           | 25     | 25            | 0.33       | 25                  | 0.2                 | 4.9  | 100,000                |
| G8NDL-27R DC12  | Seat adjustment          | 14           | 25     | 10            | 0.85       | -40 to 85           | 0.1                 | 3    | 200,000                |
| G8NDL-27R DC12  | Electronic Parking Break | 12           | 38     |               |            | -40 to 105          | 1.7                 | 23.3 | 180,000                |
| G8NDL-27HR DC12 | Power Window Motor Lock  | 14           | 25     | 25            | 0.33       | 25                  | 0.2                 | 4.9  | 100,000                |

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

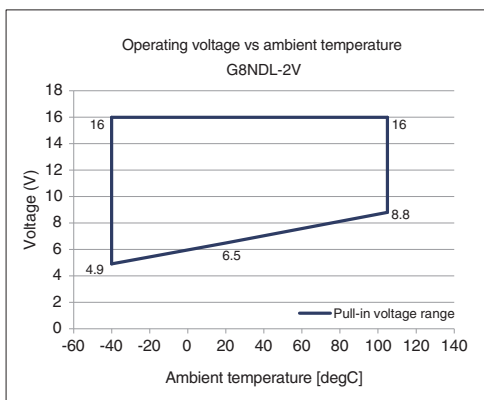
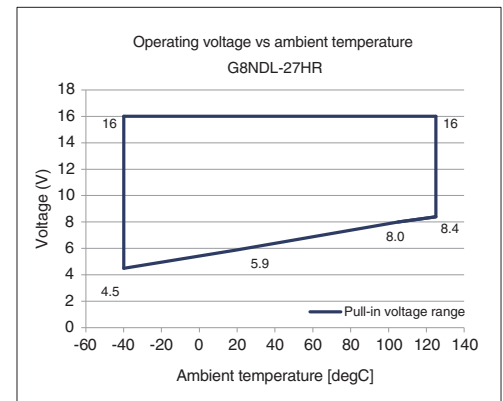
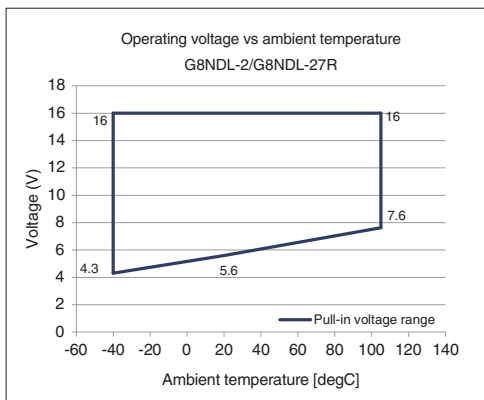


### Time Characteristic Distributions (Number of Contacts × Time (ms))



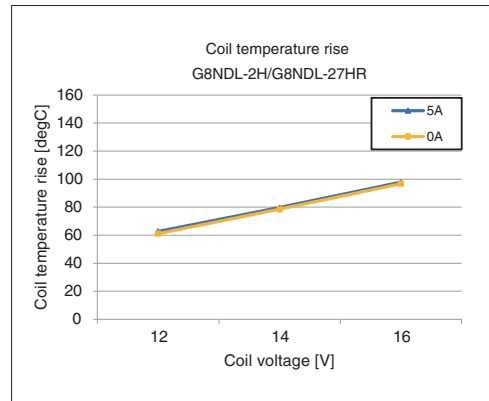
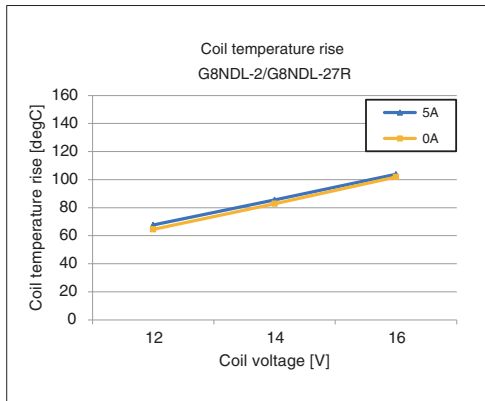
(\* The data of operate time & release time overlap due to the close distributions)

### Operating voltage vs ambient temperature (Cold start)

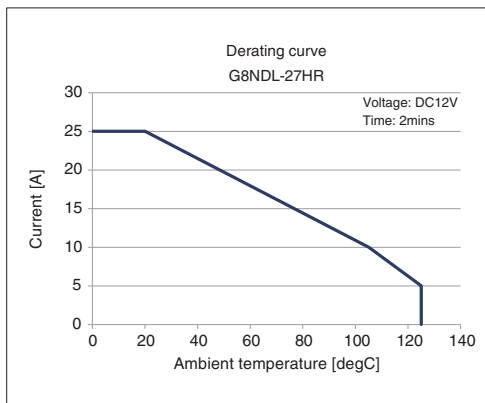


●Coil temperature rise[degC] at 20°C (Single coil energized)

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



●Derating curve

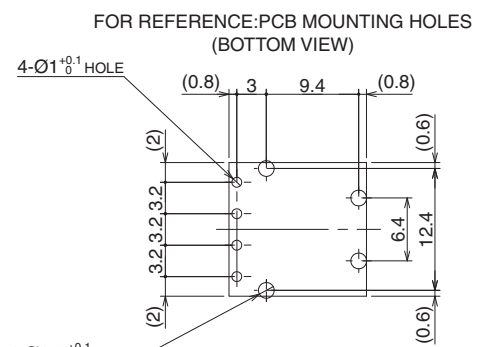
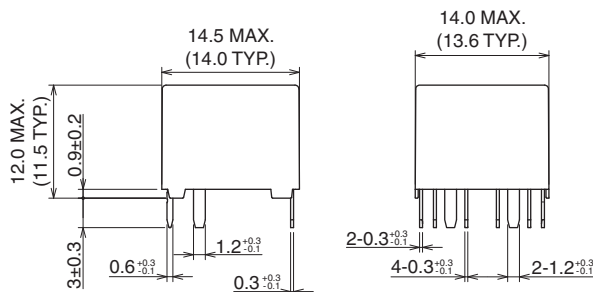
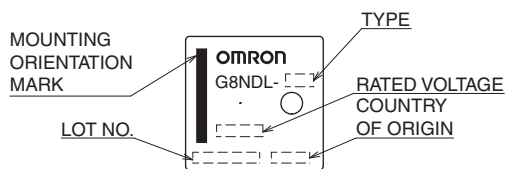


■Dimensions

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

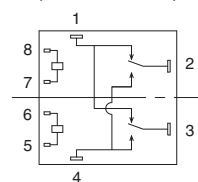
(Unit: mm)

G8NDL



\*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)



TOLERANCE UNLESS OTHERWISE SPECIFIED  
 LESS THAN 1mm : ±0.1mm  
 1 to 3mm : ±0.2mm  
 3mm OR MORE : ±0.3mm

CAD Data

---

## ■Precautions

---

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

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

---

### OMRON Corporation

Electronic and Mechanical Components Company

#### Regional Contact

**Americas**

<https://www.components.omron.com/>

**Asia-Pacific**

<https://ecb.omron.com.sg/>

**Korea**

<https://www.omron-ecb.co.kr/>

**Europe**

<http://components.omron.eu/>

**China**

<https://www.ecb.omron.com.cn/>

**Japan**

<https://www.omron.co.jp/ecb/>