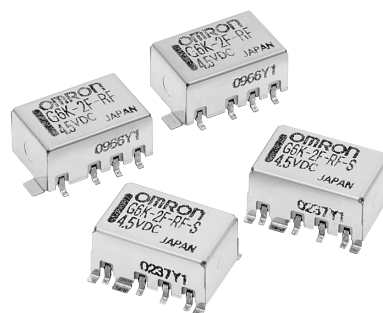


# High Frequency Relay

## G6K-RF

### Compact High Frequency Relays with 2 Form C (DPDT) Contacts

- **New** Space-saving version with smaller ground terminal footprint is available. ("-S" versions)
- Handles 1 A, 30 VDC discrete load and 1 W at 1GHz.
- Single-coil latching models available.
- Ambient temperature range: -40° to 70°C
- Low coil power consumption: 100 mW.
- Ideal for instrumentation and high-speed LAN network equipment.
- RoHS Compliant


**NEW**

## Ordering Information

| PCB Footprint                | Max.Load                           | Coil Voltage | Non-Latching part number | Single-coil latching part number |
|------------------------------|------------------------------------|--------------|--------------------------|----------------------------------|
| Standard ground terminal     | 1 A at 30 VDC,<br>0.3 A at 125 VDC | 3 VDC        | G6K-2F-RF DC3            | G6KU-2F-RF DC3                   |
|                              |                                    | 4.5 VDC      | G6K-2F-RF DC4.5          | G6KU-2F-RF DC4.5                 |
|                              |                                    | 5 VDC        | G6K-2F-RF DC5            | G6KU-2F-RF DC5                   |
|                              |                                    | 6 VDC        | G6K-2F-RF DC6            | G6KU-2F-RF DC6                   |
|                              |                                    | 9 VDC        | G6K-2F-RF DC9            | G6KU-2F-RF DC9                   |
|                              |                                    | 12 VDC       | G6K-2F-RF DC12           | G6KU-2F-RF DC12                  |
|                              |                                    | 24 VDC       | G6K-2F-RF DC24           | G6KU-2F-RF DC24                  |
| Space-saving ground terminal |                                    | 3 VDC        | G6K-2F-RF-S DC3          | G6KU-2F-RF-S DC3                 |
|                              |                                    | 4.5 VDC      | G6K-2F-RF-S DC4.5        | G6KU-2F-RF-S DC4.5               |
|                              |                                    | 5 VDC        | G6K-2F-RF-S DC5          | G6KU-2F-RF-S DC5                 |
|                              |                                    | 6 VDC        | G6K-2F-RF-S DC6          | G6KU-2F-RF-S DC6                 |
|                              |                                    | 9 VDC        | G6K-2F-RF-S DC9          | G6KU-2F-RF-S DC9                 |
|                              |                                    | 12 VDC       | G6K-2F-RF-S DC12         | G6KU-2F-RF-S DC12                |
|                              |                                    | 24 VDC       | G6K-2F-RF-S DC24         | G6KU-2F-RF-S DC24                |

**Note:** The above listed models are packaged in trays of 300. They are also available in Tape and Reel packaging.

1. Place "-TR03" before the coil voltage to obtain Tape and Reel packaging, in quantities of 300 pieces per reel.
2. Place "-TR09" before the coil voltage to obtain Tape and Reel packaging, in quantities of 900 pieces per reel.

Examples: G6K-2F-RF-S-TR09 DC5

G6KU-2F-RF-TR03 DC12

3. "-TR03" and "-TR09" is only used to identify the tape quantity when ordering and is not marked on the product, itself.

## Specifications

### ■ Contact Ratings

|                                |                                                             |
|--------------------------------|-------------------------------------------------------------|
| <b>Load</b>                    | Resistive load                                              |
| <b>Contact Material</b>        | Au alloy on Ag base                                         |
| <b>Rated load</b>              | 0.3 A at 125 VAC; 1 A at 30 VDC<br>1 W at 1 GHz (See note.) |
| <b>Rated carry current</b>     | 1 A                                                         |
| <b>Max. switching voltage</b>  | 125 VAC, 60 VDC                                             |
| <b>Max. switching current</b>  | 1 A                                                         |
| <b>Max. switching capacity</b> | 37.5 VA (AC); 30 W (DC)                                     |

**Note:** This value is for a load with V.S.W.R. ≤ 1.2

## ■ Coil Ratings

| Rated voltage | Rated current | Coil resistance | Must operate voltage                                                                 | Must release voltage                                                                   | Maximum voltage       | Rated power consumption |
|---------------|---------------|-----------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------|-------------------------|
| 3 VDC         | 33.0 mA       | 91 $\Omega$     | 80% max. of rated voltage<br><br>(75% max. of rated set voltage for latching models) | 10% min. of rated voltage<br><br>(75% max. of rated reset voltage for latching models) | 150% of rated voltage | Approx. 100 mW          |
| 4.5 VDC       | 23.2 mA       | 194 $\Omega$    |                                                                                      |                                                                                        |                       |                         |
| 5 VDC         | 21.1 mA       | 237 $\Omega$    |                                                                                      |                                                                                        |                       |                         |
| 6 VDC         | 17.6 mA       | 341 $\Omega$    |                                                                                      |                                                                                        |                       |                         |
| 9 VDC         | 11.3 mA       | 795 $\Omega$    |                                                                                      |                                                                                        |                       |                         |
| 12 VDC        | 9.1 mA        | 1,315 $\Omega$  |                                                                                      |                                                                                        |                       |                         |
| 24 VDC        | 4.6 mA        | 5,220 $\Omega$  |                                                                                      |                                                                                        |                       |                         |

- Note:** 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of  $\pm 10\%$ .  
2. The operating characteristics are measured at a coil temperature of 23°C.  
3. The maximum voltage is the highest voltage that can be imposed on the Relay coil instantaneously.

## ■ High Frequency Characteristics at 1 GHz

|                               |                                                                                                |
|-------------------------------|------------------------------------------------------------------------------------------------|
| Isolation                     | 20 dB min. between contacts of the same pole<br>30 dB min. between contacts of different poles |
| Insertion loss                | 0.2 dB max.                                                                                    |
| V.S.W.R.                      | 1.2 max.                                                                                       |
| Maximum transmission capacity | 3 W (See note 3)                                                                               |
| Maximum switching capacity    | 1 W (See note 3)                                                                               |

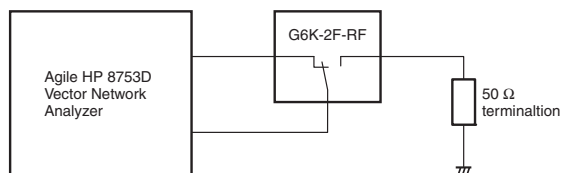
- Note:** 1. The impedance of the measurement system is 50  $\Omega$ .  
2. The above values are initial  
3. These values are for a load with V.S.W.R.  $\leq 1.2$

## ■ Characteristics

| Item                                |                                     | Single-side stable models<br>G6K-2F-RF(-S)                                        | Single-winding latching models<br>G6KU-2F-RF(-S) |
|-------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------|
| Contact resistance (See note 2.)    |                                     | 100 m $\Omega$ max.                                                               |                                                  |
| Operating (set) time (See note 3.)  |                                     | 3 ms max. (approx. 1.4 ms)                                                        | 3 ms max. (approx. 1.2 ms)                       |
| Release (reset) time (See note 3.)  |                                     | 3 ms max. (approx. 1.3 ms)                                                        | 3 ms max. (approx. 1.2 ms)                       |
| Minimum set/reset pulse time        |                                     | ---                                                                               | 10 ms                                            |
| Insulation resistance (See note 4.) |                                     | 1,000 M $\Omega$ min. (at 500 VDC)                                                |                                                  |
| Dielectric strength                 | Between coil and contacts           | 750 VAC, 50/60 Hz for 1 min                                                       |                                                  |
|                                     | Between contacts of different poles | 750 VAC, 50/60 Hz for 1 min                                                       |                                                  |
|                                     | Between contacts of the same pole   | 750 VAC, 50/60 Hz for 1 min                                                       |                                                  |
|                                     | Between ground and coil/contacts    | 500 VAC, 50/60 Hz for 1 min                                                       |                                                  |
| Vibration resistance                | Destruction                         | 10 to 55 Hz, 5-mm double amplitude and 55 to 500 to 55 Hz, 300 m/s <sup>2</sup>   |                                                  |
|                                     | Malfunction                         | 10 to 55 Hz, 3.3-mm double amplitude and 55 to 500 to 55 Hz, 200 m/s <sup>2</sup> |                                                  |
| Shock resistance                    | Destruction                         | 1,000 m/s <sup>2</sup>                                                            |                                                  |
|                                     | Malfunction                         | 750 m/s <sup>2</sup>                                                              |                                                  |
| Endurance                           | Mechanical                          | 50,000,000 operations min. (at a switching frequency of 36,000 operations/hour)   |                                                  |
|                                     | Electrical                          | 100,000 operations min. (at a switching frequency of 1,800 operations/hour)       |                                                  |
| Ambient temperature                 |                                     | Operating: -40°C to 70°C (with no icing or condensation)                          |                                                  |
| Ambient humidity                    |                                     | Operating: 5% to 85%                                                              |                                                  |
| Weight                              |                                     | Approx. 0.95 g                                                                    |                                                  |

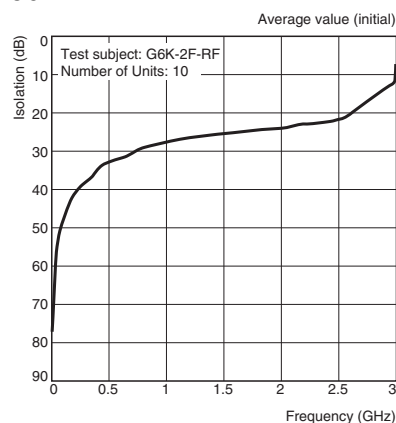
- Note:** 1. The above values are initial values.  
2. The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.  
3. Values in parentheses are typical values.  
4. The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those used for checking the dielectric strength.

# Engineering Data



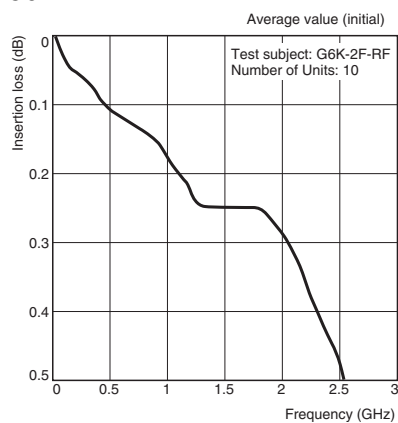
## High-Frequency Characteristics (Isolation)

### G6K-2F-RF



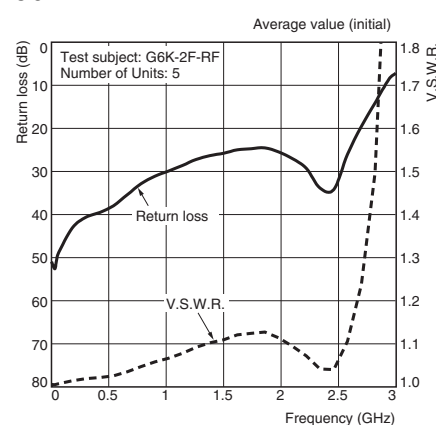
## High-frequency Characteristics (Insertion Loss)

### G6K-2F-RF

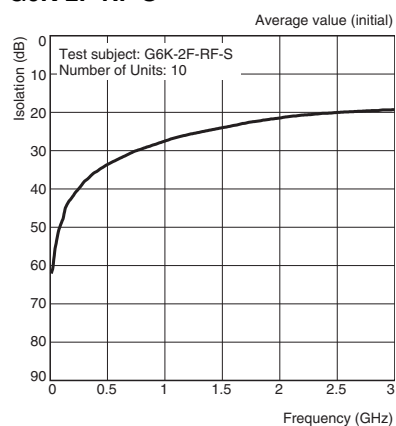


## High-frequency Characteristics (Return Loss, V.S.W.R.)

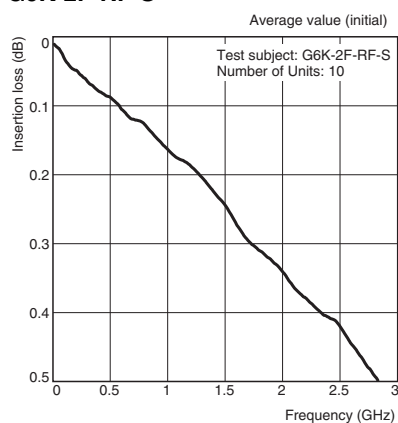
### G6K-2F-RF



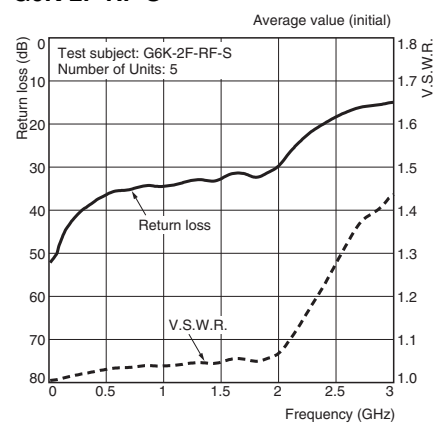
### G6K-2F-RF-S



### G6K-2F-RF-S



### G6K-2F-RF-S

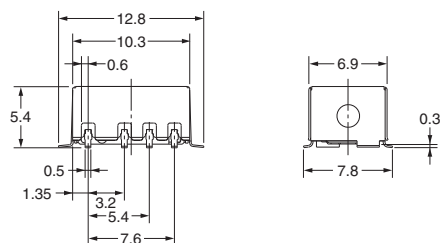
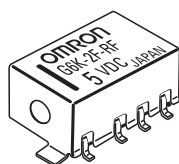


- Note:**
1. Refer to the G6K specification for basic specifications and characteristics not shown above
  2. Ambient temperature condition: 23°C
  3. The high-frequency characteristics depend on the mounting board. Be sure to check actual operation, including durability, in actual equipment before use.

# Dimensions

Note: All dimensions are in millimeters unless otherwise indicated

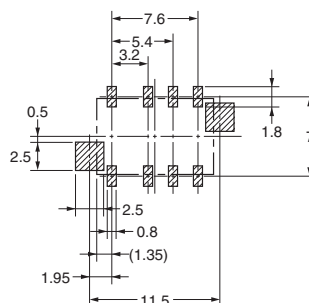
## G6K-2F-RF G6KU-2F-RF



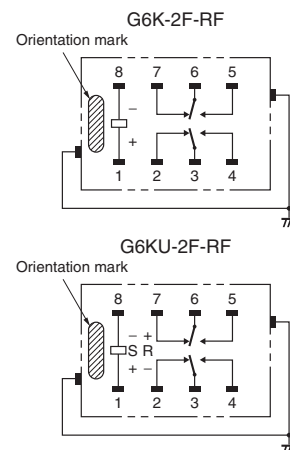
- Note: 1. Each value has a tolerance of  $\pm 0.3$  mm  
2. The coplanarity of the terminals is 0.15 mm max.

### Mounting Dimensions (Top View)

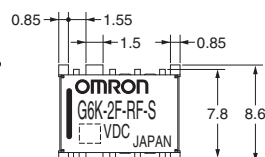
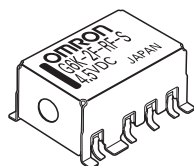
Tolerance  $\pm 0.1$  mm



### Terminal Arrangement and Internal Connections (Top View)



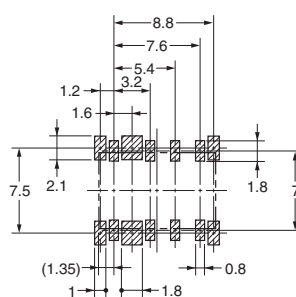
## G6K-2F-RF-S G6KU-2F-RF-S



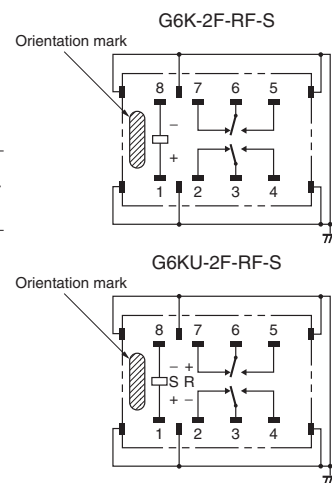
- Note: 1. Each value has a tolerance of  $\pm 0.3$  mm  
2. The coplanarity of the terminals is 0.15 mm max.

### Mounting Dimensions (Top View)

Tolerance  $\pm 0.1$  mm



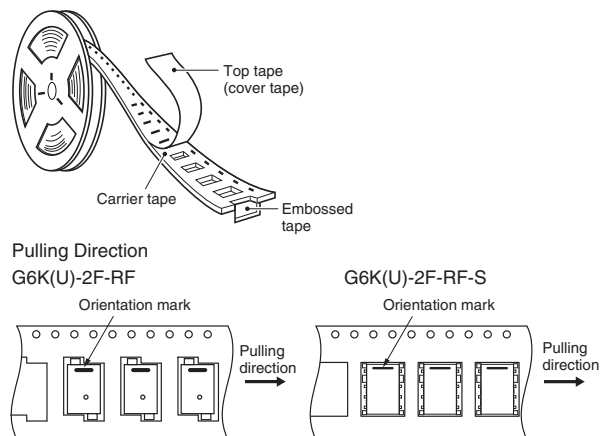
### Terminal Arrangement and Internal Connections (Top View)



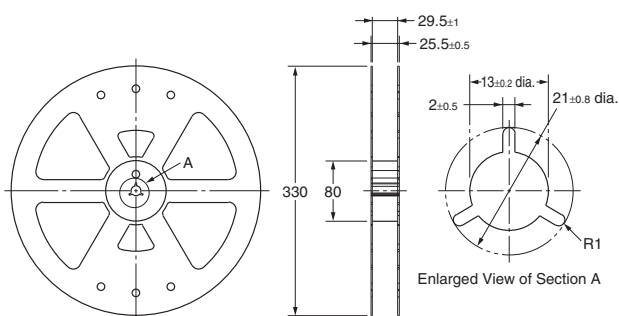
# Tape Packaging Specifications

- Add “-TR03” or “-TR09” before the coil voltage to order relays in Tape and Reel packaging. If “-TR03” or “-TR09” is not included, then the relays will be provided in trays of 300 relays per tray.
  - - Add “-TR03” to obtain 300 relays per reel
  - - Add “-TR09” to obtain 900 relays per reel

## 1. Direction of Relay insertion

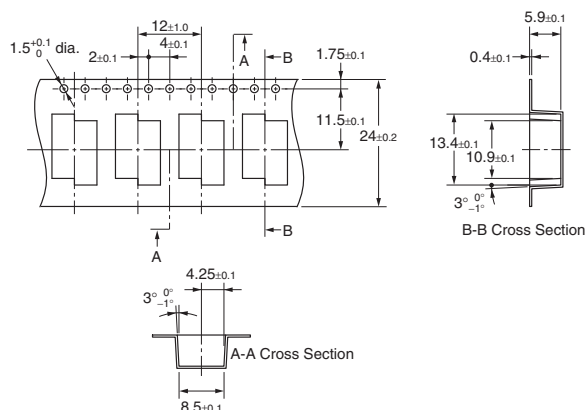


## 2. Reel Dimensions

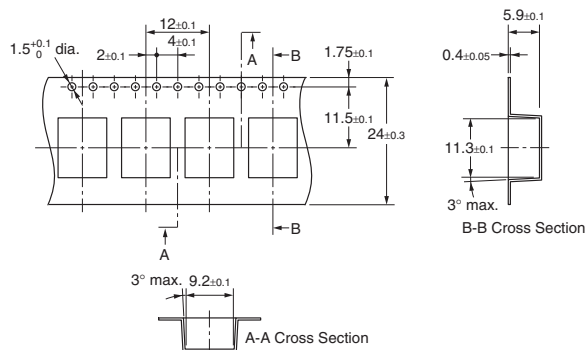


## 3. Carrier Tape Dimensions

### G6K(U)-2F-RF



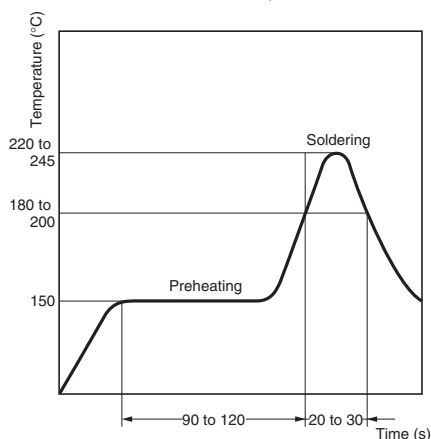
### G6K(U)-2F-RF-S



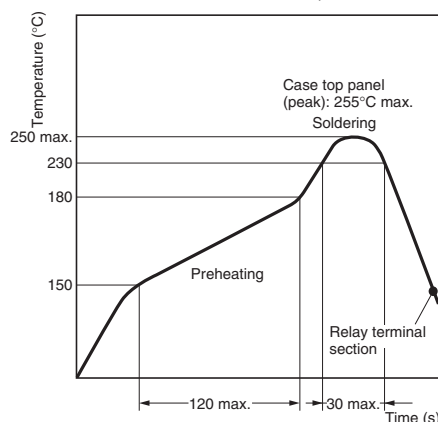
# Precautions

## ■ Recommended Soldering Method

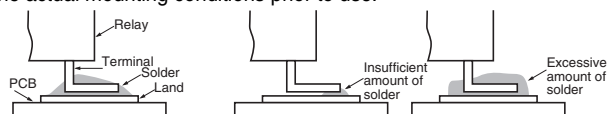
### 1. Temperature Profile for Lead Solder (Measured at the PCB)



### 2. Temperature Profile for Lead-free Solder (Measured at the PCB)



3. The thickness of cream solder to be applied should be between 200 and 250  $\mu\text{m}$  and the land pattern should be based on Omron's recommended PCB pattern. To maintain the correct soldering joint shown in the following diagram, we recommend applying solder using the soldering conditions shown above. Check the soldering in the actual mounting conditions prior to use.



## ■ Precautions for correct use

For general precautions, refer to Omron's Relay Technical guidelines, contained in Omron's relay catalog.

### Relay Handling

Do not unpack the relay until ready to mount it. Use the relay as soon as possible after opening the moisture-proof bag. Otherwise, the terminals may tarnish and seal failure may occur after the solder process.

When washing the product after soldering, use a water-based or alcohol-based solvent. Keep the solvent temperature below 40°C. Do not put the relay in a cold cleaning bath immediately after soldering.

### Operating, Storage Environment

If the relay is stored for a long time in an adverse environment with high temperature, high humidity, organic or sulfide gases, then sulfide or oxide films will form on the contact surfaces. These films may result in unstable contact, contact problems or function problems. Therefore, operate, store or transport the product under specified environmental conditions.

1. Use in locations where the relay is not exposed to corrosive gas such as hydrogen sulfide gas or salty air.
2. Use in locations where no visible dust exists.
3. Use in locations where the product is not exposed to direct sunlight, rain or snow.
4. Do not apply force to the product which may result in deformation or change in quality of the product.

### Coating

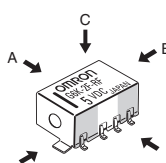
The relay mounted on the PCB may be coated or washed, but do not apply silicone coating or detergent containing silicone, otherwise, the silicone coating or detergent may remain on the surface of the relay.

### Latching Relay Mounting

Make sure that excess vibration or shock doesn't set or reset the relay during normal operation. The relay is shipped in the 'reset' position. Shock or vibration during shipping may require the application of a reset signal, prior to operation.

### Claw Securing Force During Automatic Mounting

During automatic insertion of relays, make sure to set the securing force of each claw to the following so that the relay's characteristics will be maintained.



Direction A: 1.96 N max.  
Direction B: 4.90 N max.  
Direction C: 1.96 N max.

Secure the claws to the shaded area. Do not attach them to the center of the relay or just one part of the relay.

### Maximum Allowable Voltage

The maximum allowable voltage of the coil can be obtained from the coil temperature increase and the heat-resisting temperature of the coil insulating sheath material. (Exceeding the heat-resisting temperature may result in burning or short-circuiting.) The maximum allowable voltage also involves important restrictions which include the following:

- Must not cause thermal changes in or deterioration of the insulating material, which may result in films developing on the contacts.
- Must not cause damage to other control devices.
- Must not cause any harmful effect on people.
- Must not cause fire.

Therefore, be sure to use the maximum allowable voltage as specified in the catalog. As a rule, the rated voltage must be applied to the coil. A voltage exceeding the rated value, however, can be applied to the coil providing that the voltage is less than or equal to the maximum allowable voltage. It must be noted that continuous voltage application to the coil will cause a coil temperature increase which may affect characteristics such as electrical life and coil insulation.

Consider using a latching relay instead of a non-latching relay with a continuous voltage applied to the coil.

# Omron Electronic Components, LLC

## Terms and Conditions of Sales

### I. GENERAL

- Definitions:** The words used herein are defined as follows.
  - Terms:** These terms and conditions
  - Seller:** Omron Electronic Components LLC and its subsidiaries
  - Buyer:** The buyer of Products, including any end user in section III through VI
  - Products:** Products and/or services of Seller
  - Including:** Including without limitation
- Offer/Acceptance:** These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
- Distributor:** Any distributor shall inform its customer of the contents after and including section III of these Terms.

### II. SALES

- Prices; Payment:** All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at the time the purchase order is accepted by Seller. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.
- Discounts:** Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller's payment terms and (b) Buyer has no past due amounts owing to Seller.
- Interest:** Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
- Orders:** Seller will accept no order less than 200 U.S. dollars net billing.
- Currencies:** If the prices quoted herein are in a currency other than U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available during the period between the due date and the date remittance is actually made.
- Governmental Approvals:** Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.
- Taxes:** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Seller or required to be collected directly or indirectly by Seller for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Seller.
- Financial:** If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Seller may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
- Cancellation; Etc:** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
- Force Majeure:** Seller shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
- Shipping; Delivery:** Unless otherwise expressly agreed in writing by Seller:
  - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
  - Delivery and shipping dates are estimates only; and
  - Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims:** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier or any claim related to pricing or other charges must be presented in detail in writing to Seller within 30 days of receipt of shipment.

### III. PRECAUTIONS

- Suitability:** IT IS THE BUYER'S SOLE RESPONSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
- Use with Attention:** The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
  - Outdoor use, use involving potential chemical contamination or electrical interference.

- Use in consumer Products or any use in significant quantities.
  - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - Systems, machines, and equipment that could present a risk to life or property.
- Prohibited Use:** NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
  - Motorized Vehicle Application:** USE OF ANY PRODUCT/S FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY SELLER.
  - Programmable Products:** Seller shall not be responsible for the Buyer's programming of a programmable Product.

### IV. WARRANTY AND LIMITATION

- Warranty:** Seller's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT ALL OTHER WARRANTIES, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS.
- Buyer Remedy:** Seller's sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller's election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that there shall be no liability for Seller or its affiliates unless Seller's analysis confirms that the Products were correctly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Seller before shipment.
- Limitation on Liability:** SELLER AND ITS AFFILIATES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. FURTHER, IN NO EVENT SHALL LIABILITY OF SELLER OR ITS AFFILIATES EXCEED THE INDIVIDUAL PRICE OF THE PRODUCT ON WHICH LIABILITY IS ASSERTED.
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- Change In Specifications:** Product specifications and descriptions may be changed at any time based on improvements or other reasons. It is Seller's practice to change part numbers when published ratings or features are changed, or when significant engineering changes are made. However, some specifications of the Product may be changed without any notice.
- Errors And Omissions:** The information on Seller's website or in other documentation has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.
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  - (ii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - (iii) Use in consumer products or any use in significant quantities.
  - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this product.

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**OMRON ELECTRONIC  
COMPONENTS LLC**

55 E. Commerce Drive, Suite B  
Schaumburg, IL 60173

**847-882-2288**

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