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



<u>NEW</u>

Ordering Information

| PCB Footprint | Max.Load | Coil Voltage | Non-Latching part number | Single-coil latching part number |
|--|------------------------------------|--------------|--------------------------|----------------------------------|
| Standard ground terminal Space-saving ground terminal | 1 A at 30 VDC, 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 |
| | | 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

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

Note: This value is for a load with V.S.W.R. \leq 1.2

■ Coil Ratings

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

- Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±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 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) |

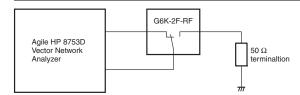
- **Note: 1.** The impedance of the measurement system is 50 Ω .
 - 2. The above values are initial
 - **3.** These values are for a load with V.S.W.R. \leq 1.2

■ Characteristics

| Item | | Single-side stable models | Single-winding latching models | |
|-------------------------------------|-------------------------------------|---|--------------------------------|--|
| | | G6K-2F-RF(-S) | G6KU-2F-RF(-S) | |
| Contact resistance (See note 2.) | | 100 m Ω 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 MΩ 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 ² | | |
| | Malfunction | 10 to 55 Hz, 3.3-mm double amplitude and 55 to 500 to 55 Hz, 200 m/s ² | | |
| Shock resistance | Destruction | 1,000 m/s ² | | |
| | Malfunction | 750 m/s ² | | |
| 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 | | |

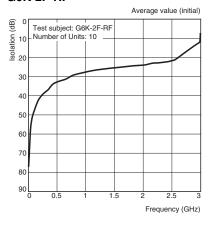
- Note: 1. The above values are initial values.
 - 2. The contact resistance was measured with 10 mA at 1 VDC with a voltage drop method.
 - 3. Values in parentheses are typical values.
 - 4. The insulation resistance was measured with a 500-VDC megohmmeter applied to the same parts as those used for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

Engineering Data



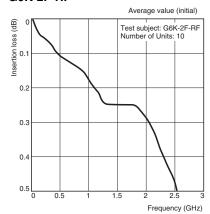
High-Frequency Characteristics (Isolation)

G6K-2F-RF



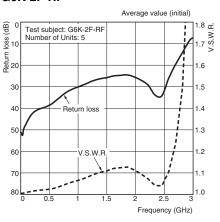
High-frequency Characteristics (Insertion Loss)

G6K-2F-RF

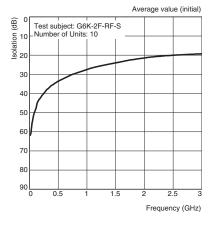


High-frequency Characteristics (Return Loss, V.S.W.R.)

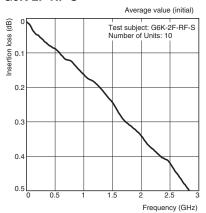
G6K-2F-RF



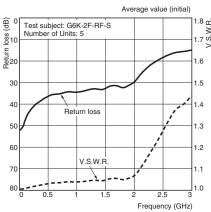
G6K-2F-RF-S



G6K-2F-RF-S



G6K-2F-RF-S

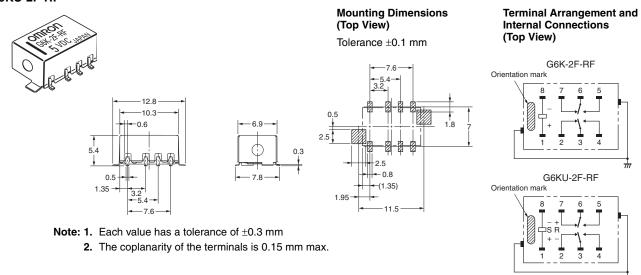


- Note: 1. Refer to the G6K specification for basic specifications and characteristics not shown above
 - 2. Ambient temperature condition: 23°C
 - 3. The high-frequency characteristics depend on the mounting board. Be sure to check actual operation, including durability, in actual equipment before use.

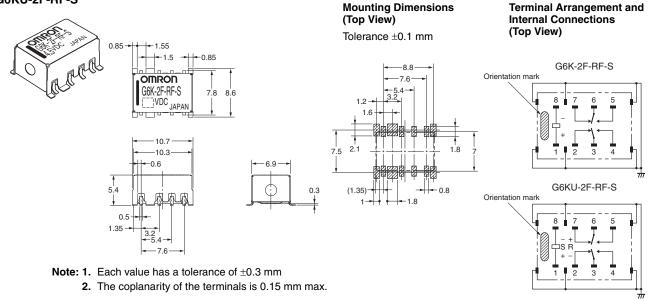
Dimensions

Note: All dimensions are in millimeters unless otherwise indicated

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



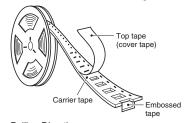
G6K-2F-RF-S G6KU-2F-RF-S

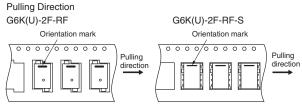


Tape Packaging Specifications

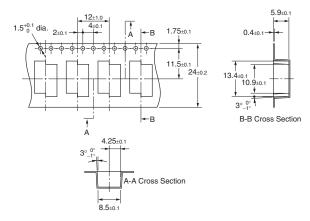
- Add "-TR03" or "-TR09" before the coil voltage to order relays in Tape and Reel packaging. If "-TR03" or "-TR09" is not included, then the relays will be provided in trays of 300 relays per tray.
 - - Add "-TR03" to obtain 300 relays per reel
 - - Add "-TR09" to obtain 900 relays per reel

1. Direction of Relay insertion

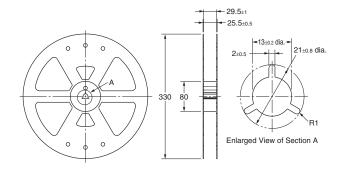




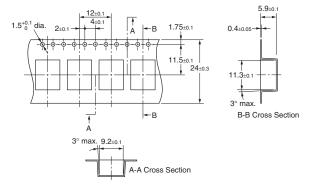
3. Carrier Tape Dimensions G6K(U)-2F-RF



2. Reel Dimensions



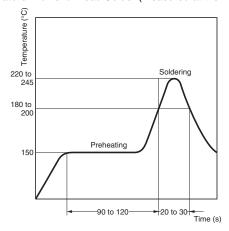
G6K(U)-2F-RF-S



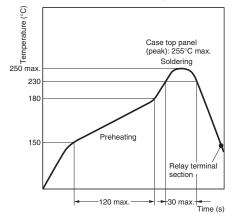
Precautions

■ Recommended Soldering Method

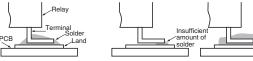
1. Temperature Profile for Lead Solder (Measured at the PCB)



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 μm 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.

- 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.
- 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

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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.
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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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- Severability: If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision.

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 - Use in consumer products or any use in significant quantities. Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this

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- a guide for the user in determining suitability and does not constitute a war-ranty. It may represent the result of Seller's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to
- correlate it to actual application requirements. Actual performance is subject to Seller's Warranty and Limitations of Liability.

 Change in Specifications. Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are change, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Seller representative at any time to confirm actual specifications of purchased Product. your application. Please consult will your speller representative at any time to confirm actual specifications of purchased Product.

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 RoHS Compliance. Where indicated, our products currently comply, to the best of our knowledge as of the date of this publication, with the requirements of the European Union's Directive on the Restriction of certain Hazardous Substances ("RoHS"), although the requirements of RoHS do not take effect until July 2006. These requirements may be subject to change. Please consult until July 2006. These requirements may be subject to change. Please consult our website for current information.

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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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