# Solid State Relays
# G3R/G3RD

Refer to *Warranty and Application Considerations* (page 1), *Safety Precautions* (page 4), and *Technical and Safety Information* (page 6).

## Compact SSRs Ideal for Built-in Applications

- Vertical, compact SSRs with an operation indicator offered in versatile variations.
- High dielectric strength of 2,500 VAC for 2-A models.
- High-voltage DC version also available.
- Certified by UL and CSA.

# Model Number Structure

## ■ Model Number Legend

**G3R-□□□□□-□**
**1 2 3 4 5 6 7**

**1. Basic Model Name**
G3R: Solid State Relay

**2. Rated Load Power Supply Voltage**
1: 100 VAC
2: 200 VAC

**3. Rated Load Current**
02: 2 A

**4. Terminal Type**
P: PCB terminals

**5. Isolation Method**
Blank: Phototriac/photocoupler isolation with zero cross function
L: Phototriac/photocoupler isolation without zero cross function

**6. Operation Indicator**
N: Equipped with operation indicator

**7. Certification**
US: Certified by UL and CSA



**G3RD-□□□□-□**
**1 2 3 4 5 6 7**

**1. Basic Model Name**
G3R: Solid State Relay

**2. Rated Output Load**
D: Switches DC loads

**3. Rated Load Power Supply Voltage**
1: 100 VDC
X: 50 VDC

**4. Rated Load Current**
01: 1.5 A
02: 2 A

**5. Terminal Type**
P: PCB terminals

**6. Operation Indicator**
N: Equipped with operation indicator

**7. Certification**
US: Certified by UL and CSA

# Ordering Information

## ■ List of Models

| Terminals | Isolation | Zero cross function | Indicator | Rated output load | Rated input voltage | Model |
|---|---|---|---|---|---|---|
| PCB | Phototriac | Yes | Yes | 2 A at 100 to 120 VDC (See note 1.) | 5, 12, 24 VDC | G3R-102PN-US |
| | | No | | | | G3R-102PLN-US |
| | | Yes | | 2 A at 100 to 240 VAC (See note 2.) | | G3R-202PN-US |
| | | No | | | | G3R-202PLN-US |
| | Photocoupler | --- | Yes | 1.5 A at 5 to 110 VDC | | G3RD-101PN-US |
| | | | | 2 A at 4 to 48 VDC (See note 3.) | | G3RD-X02PN-US |

**Note: 1.** Product is labelled “125 VAC”.
**2.** Product is labelled “250 VAC”.
**3.** Product is labelled “50 VDC”.
**4.** When ordering, specify the rated input voltage.

# Specifications

## ■ Ratings (at an Ambient Temperature of 25°C)

### Input (AC Output With Zero Cross Function)

| Model | Rated voltage | Operating voltage | Impedance | Voltage level | |
|---|---|---|---|---|---|
| | | | | Must operate voltage | Must release voltage |
| **G3R-102PN-US**<br>**G3R-202PN-US** | 5 VDC | 4 to 6 VDC | 250 Ω±20% | 3.5 VDC max. | 0.375 VDC min. |
| | 12 VDC | 9.6 to 14.4 VDC | 600 Ω±20% | 8.4 VDC max. | 0.9 VDC min. |
| | 24 VDC | 19.2 to 28.8 VDC | 1.5 kΩ±20% | 16.8 VDC max. | 1.8 VDC min. |

### Input (AC Output Without Zero Cross Function, DC Output)

| Model | Rated voltage | Operating voltage | Impedance | Voltage level | |
|---|---|---|---|---|---|
| | | | | Must operate voltage | Must release voltage |
| **G3R-102PLN-US** | 5 VDC | 4 to 6 VDC | 300 Ω±20% | 3.5 VDC max. | 0.375 VDC min. |
| **G3R-202PLN-US** | 12 VDC | 9.6 to 14.4 VDC | 750 Ω±20% | 8.4 VDC max. | 0.9 VDC min. |
| **G3RD-X02PN-US**<br>**G3RD-101PN-US** | 24 VDC | 19.2 to 28.8 VDC | 1.5 kΩ±20% | 16.8 VDC max. | 1.8 VDC min. |

### Output

| Model | Rated load voltage | Applicable load | | |
|---|---|---|---|---|
| | | Load voltage range | Load current | Inrush current |
| **G3R-102PN-US**<br>**G3R-102PLN-US** | 100 to 120 VAC | 75 to 132 VAC | 0.1 to 2 A | 30 A (60 Hz, 1 cycle) |
| **G3R-202PN-US**<br>**G3R-202PLN-US** | 100 to 240 VAC | 75 to 264 VAC | 0.1 to 2 A | |
| **G3RD-X02PN-US** | 4 to 48 VDC | 3 to 52.8 VDC | 0.01 to 2 A | 8 A (10 ms) |
| **G3RD-101PN-US** | 5 to 110 VDC | 3 to 125 VDC | 0.01 to 1.5 A | 2.5 A (10 ms) |

## ■ Characteristics

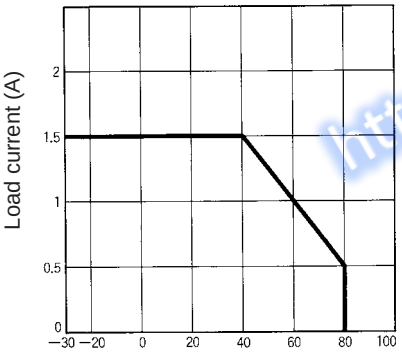
| Item | G3R-102PLN-US | G3R-102PN-US | G3R-202PLN-US | G3R-202PN-US | G3RD-X02PN/-101PN-US |
|---|---|---|---|---|---|
| **Operate time** | 1 ms max. | 1/2 of load power source cycle + 1 ms max. | 1 ms max. | 1/2 of load power source cycle + 1 ms max. | 1 ms max. |
| **Release time** | 1/2 of load power source cycle + 1 ms max. | | | | 1 ms max. |
| **Output ON voltage drop** | 1.6 V (RMS) max. | | | | 1.5 V max. |
| **Leakage current** | 2 mA max. (at 100 VAC) | | 2 mA max. (at 100 VAC)<br>5 mA max. (at 200 VAC) | | 0.1 mA max. (at 50 VDC)<br>0.1 mA max. (at 125 VDC) |
| **Insulation resistance** | 100 MΩ min. (at 500 VDC) | | | | |
| **Dielectric strength** | 2,500 VAC, 50/60 Hz for 1 min | | | | 2,500 VAC, 50/60 Hz for 1 min |
| **Vibration resistance** | Malfunction: 10 to 55 to 10 Hz, 0.75-mm single amplitude | | | | |
| **Shock resistance** | Malfunction: 1,000 $m/s^2$ | | | | |
| **Ambient temperature** | Operating: –30°C to 80°C (with no icing or condensation)<br>Storage: –30°C to 100°C (with no icing or condensation) | | | | |
| **Certified standards** | UL508 File No. E64562, CSA C22.2 (No. 14) File No. 35535 | | | | |
| **Ambient humidity** | Operating: 45% to 85% | | | | |
| **Weight** | Approx. 18 g | | | | |

# Engineering Data

## Load Current vs. Ambient Temperature Characteristics

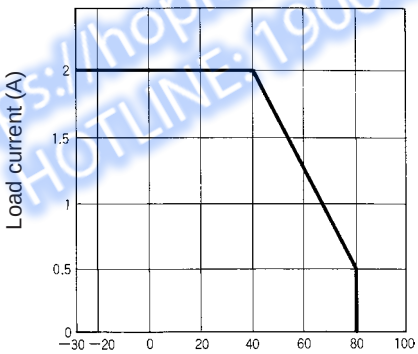
### 1-A Load Model

**G3RD-101PN-US**




### 2-A Load Model

**G3R-102□-US, G3R-X02□-US, G3R-202□-US**

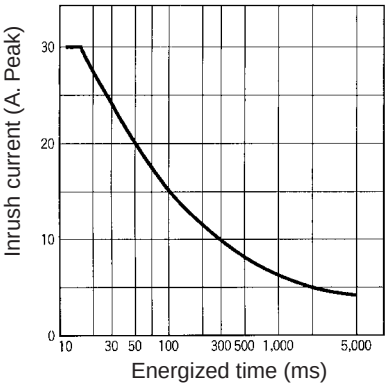




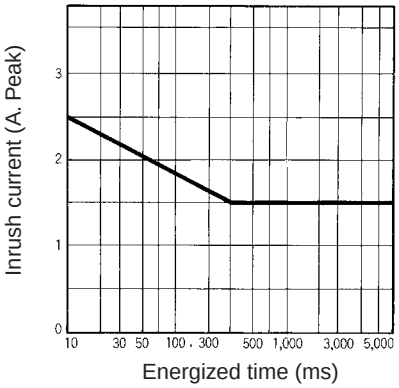

## One Cycle Surge Current: Non-repetitive

Non-repetitive (Keep the inrush current to half the rated value if it occurs repetitively.)

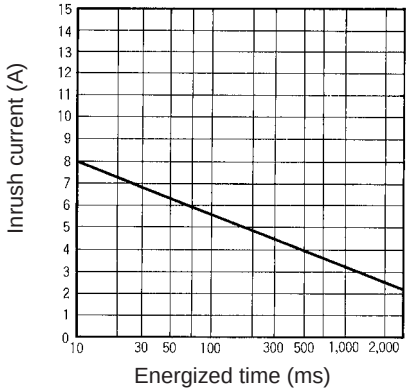
**G3R-102□-US/-202□-US**




**G3RD-101PN-US**



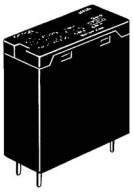

**G3RD-X02□-US**

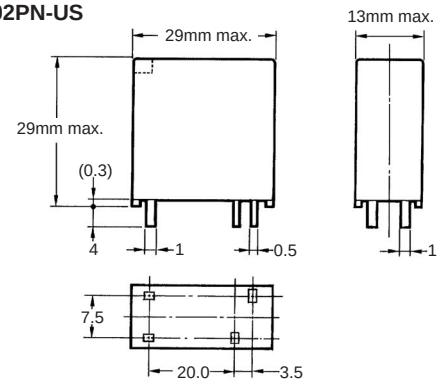


# Dimensions

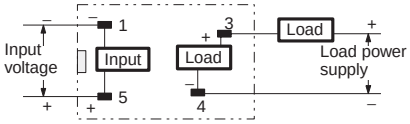
**Note:** All units are in millimeters unless otherwise indicated.

**G3R-102P□-US/-202P□-US**
**G3RD-101PN-US/-X02PN-US**



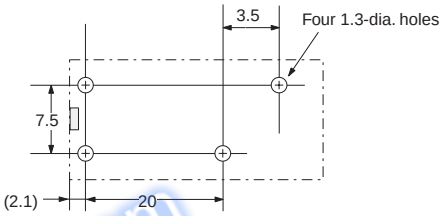



**Terminal Arrangement/ Internal Connections (Bottom View)**




**Note:** The plus and minus symbols shown in the parentheses are for DC loads.

**Mounting Holes**




# Safety Precautions

## ■ Precautions for Correct Use

Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effect on product performance.

### Connection

The SSR for DC switching a surge can connect to a load regardless of the polarity of the positive and negative output terminals.

### Protective Terminal

For AC inductive loads, connect the load terminals of the SSR to a surge absorber (varistor).



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. K059-E1-05 In the interest of product improvement, specifications are subject to change without notice.