

# G3VM-6□G□/61VY1

MOS FET Relays SOP 4-pin, General-purpose Type

## General-purpose MOS FET Relays in SOP 4-pin packages for a wide range of applications

- Contact form: 1a (SPST-NO) or 1b (SPST-NC)
- Load voltage: 60 V



Note: The actual product is marked differently from the image shown here.

RoHS Compliant

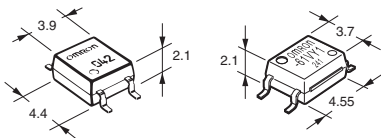
### Application Examples

- Semiconductor test equipment
- Test & Measurement equipment
- Communication equipment
- Security equipment
- Industrial equipment
- Power circuit
- Amusement equipment

### Package (Unit : mm, Average)

SOP 4-pin

Special  
SOP 4-pin



Note: The actual product is marked differently from the image shown here.

### Model Number Legend

G3VM-□□□□□  
1 2 3 4 5

#### 1. Load voltage

6: 60 V

#### 2. Contact form

- 1: 1a (SPST-NO)
- 3: 1b (SPST-NC)

#### 3. Package

- G: SOP 4-pin
- V: Special SOP 4-pin

#### 4. Additional functions

- None: Dielectric strength between I/O 1500 V
- Y: Dielectric strength between I/O 3750 V

#### 5. Other informations

When specifications overlap, serial code is added in the recorded order.

### Ordering Information

| Package           | Contact form | Terminals                  | Load voltage (peak value) * | Continuous load current (peak value) * | Stick packaging |                          | Tape packaging |                          |
|-------------------|--------------|----------------------------|-----------------------------|--|-----------------|--------------------------|----------------|--------------------------|
|                   |              |                            |                             |  | Model           | Minimum package quantity | Model          | Minimum package quantity |
| SOP4              | 1a (SPST-NO) | Surface-mounting Terminals | 60 V                        | 400 mA                                 | G3VM-61G1       | 100 pcs.                 | G3VM-61G1(TR)  | 2500 pcs.                |
| Special SOP 4-pin |              |                            |                             | 100 mA                                 | G3VM-61G2       |                          | G3VM-61G2(TR)  |                          |
| SOP4              | 500 mA       | G3VM-61G3                  | G3VM-61G3(TR)               |  |                 |                          |                |                          |
| SOP4              | 1b (SPST-NC) |                            |                             |  | G3VM-61VY1      | 150 pcs.                 | G3VM-61VY1(TR) | 3000 pcs.                |
|                   |              |                            |                             |  | G3VM-63G        | 100 pcs.                 | G3VM-63G(TR05) | 500 pcs.                 |

\* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" or "(TR05)" to the end of the model number.

### Absolute Maximum Ratings (Ta = 25°C)

| Item                          | Symbol  | G3VM-61G1        | G3VM-61G2   | G3VM-61G3 | G3VM-61VY1 | G3VM-63G    | Unit  | Measurement conditions        |
|-------------------------------|---|------------------|-------------|-----------|------------|-------------|-------|-------------------------------|
| Input                         | LED forward current                           | If               |             | 30        |            | 50          | mA    |                               |
|                               | LED forward current reduction rate            | ΔIf/°C           |             | -0.3      |            | -0.5        | mA/°C | Ta ≥ 25°C                     |
|                               | LED reverse voltage                           | VR               |             | 5         |            |             | V     |                               |
|                               | Connection temperature                        | TJ               |             | 125       |            |             | °C    |                               |
| Output                        | Load voltage (AC peak/DC)                     | V <sub>OFF</sub> |             | 60        |            |             | V     |                               |
|                               | Continuous load current (AC peak/DC)          | Io               |             | 100       |            | 500         | mA    |                               |
|                               | ON current reduction rate                     | ΔIo/°C           |             | -1.0      |            | -5.0        | mA/°C | Ta ≥ 25°C                     |
|                               | Pulse ON current                              | I <sub>op</sub>  |             | 300       |            | 1500        | mA    | t=100 ms, Duty=1/10           |
|                               | Connection temperature                        | TJ               |             | 125       |            |             | °C    |                               |
|                               | Dielectric strength between I/O (See note 1.) | Vi-o             |             | 1500      |            | 3750        | 1500  | V <sub>rms</sub>              |
| Ambient operating temperature | Ta  |                  | -40 to +85  |           |            | -40 to +105 | °C    | With no icing or condensation |
| Ambient storage temperature   | T <sub>stg</sub>                              |                  | -55 to +125 |           |            |             | °C    |                               |
| Soldering temperature         | -   |                  | 260         |           |            |             | °C    | 10 s                          |

Note: 1. The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

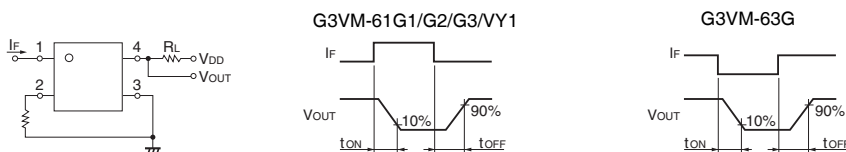
SOP

G3VM-6□G□/61VY1

## Electrical Characteristics (Ta = 25°C)

| Item  |  | Symbol                 |                 | G3VM-61G1 | G3VM-61G2 | G3VM-61G3 | G3VM-61VY1 | G3VM-63G | Unit   | Measurement conditions   |        |
|---|--|------------------------|-----------------|-----------|-----------|-----------|------------|----------|--|--|--------|
| Input                                       | LED forward voltage                    | VF                     | Minimum         | 1.0       |           | 1.1       |            | 1.0      | V  | IF=10 mA   |        |
|   |  |                        | Typical         | 1.15      |           | 1.27      |            | 1.15     |  |  |        |
|   |  |                        | Maximum         | 1.3       |           | 1.4       |            | 1.3      |  |  |        |
|   | Reverse current                        | IR                     | Maximum         | 10        |           |           |            |          |  | μA   | VR=5 V |
|   | Capacitance between terminals          | CT                     | Typical         | 30        |           |           | 50         | 30       | pF   | V=0, f=1 MHz   |        |
| Trigger LED forward current                 | IFT (IFC) (See note 3)                 | Typical                | 1.6             | 0.4       | –         | 0.2       | 0.6        | mA       | G3VM-61G1/61G2/61G3 :<br>Io=400 mA<br>G3VM-61VY1 : Io=100 mA<br>G3VM-63G : IoFF=10 μA  |  |        |
|   |  | Maximum                | 3               | 1         | 0.2       | 1         | 3          |          |  |  |        |
|   | Release LED forward current            | IFC (IFT) (See note 3) | Minimum         | 0.1       |           | –         | 0.01       |          |  | 0.1  | mA     |
| Typical                                     | –                                      |                        | 0.001           | –         |           |           |            |          |  |  |        |
| Output                                      | Maximum resistance with output ON      | RON                    | Typical         | 1         |           |           | 25         | 1        | Ω  | G3VM-61G1 :IF=5 mA,<br>Io=400 mA<br>G3VM-61G2 :IF=2 mA,<br>Io=400 mA<br>G3VM-61G3 :IF=0.5 mA,<br>Io=400 mA, t<1s<br>G3VM-61VY1 :IF=2 mA,<br>Io=100 mA, t<1s<br>G3VM-63G: Io=500 mA |        |
|   |  |                        | Maximum         | 2         |           |           | 50         | 2.5      |  |  |        |
|   | Current leakage when the relay is open | ILEAK                  | Typical         | –         | 1         |           | –          |          | nA   | VOFF=60 V  |        |
|   |  |                        | Maximum         | 1000      |           |           |            |          |  |  |        |
| Capacitance between terminals               | COFF                                   | Typical                | 130             |           |           | 10        | 100        | pF       | G3VM-61G1/61G2/61G3:<br>V=0, f=1 MHz<br>G3VM-63G:<br>V=0, f=1 MHz, IF=5 mA   |  |        |
| Capacitance between I/O terminals           | CI-O                                   | Typical                | 0.8             |           |           |           |            |          | pF   | f=1 MHz, Vs=0 V  |        |
| Insulation resistance between I/O terminals | RI-O                                   | Minimum                | 1000            |           |           |           |            |          | MΩ   | VI-O=500 VDC, RoH≤60%  |        |
|   |  | Typical                | 10 <sup>8</sup> |           |           |           |            |          |  |  |        |
| Turn-ON time                                | ton                                    | Typical                | 0.8             | 3         | 3.5       | 1         | 0.3        | ms       | G3VM-61G1/63G:IF=5 mA,<br>RL=200 Ω, VDD=20 V (See note 2.)<br>G3VM-61G2 :IF=2 mA,<br>RL=200 Ω, VDD=20 V (See note 2.)<br>G3VM-61G3 :IF=0.5 mA,<br>RL=200 Ω, VDD=20 V (See note 2.)<br>G3VM-61VY1 :IF=2 mA,<br>RL=200 Ω, VDD=10 V (See note 2.) |  |        |
|   |  | Maximum                | 2               | 8         | 10        | 5         | 1          |          |  |  |        |
| Turn-OFF time                               | toff                                   | Typical                | 0.1             |           |           | 1         |            | 0.7      |  |  |        |
|   |  | Maximum                | 0.5             | 3         | 5         |           | 3          |          |  |  |        |

Note: 2. Turn-ON and Turn-OFF Times



Note: 3. These values are for Relays with NC contacts

## Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

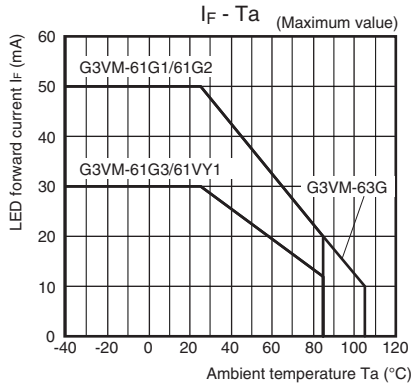
| Item                                 | Symbol |         | G3VM-61G1 | G3VM-61G2 | G3VM-61G3 | G3VM-61VY1 | G3VM-63G | Unit |    |
|--------------------------------------|--------|---------|-----------|-----------|-----------|------------|----------|------|----|
| Load voltage (AC peak/DC)            | VDD    | Maximum | 48        |           |           |            |          |      | V  |
| Operating LED forward current        | IF     | Minimum | 5         | –         | –         | 2          | 5        | mA   |    |
|                                      |        | Typical | 7.5       | 2         | 0.5       | 5          | –        |      |    |
|                                      |        | Maximum | 25        |           |           | 15         | 25       |      |    |
| Continuous load current (AC peak/DC) | Io     | Maximum | 400       | 320       |           | 80         | 500      |      |    |
| Ambient operating temperature        | Ta     | Minimum | –20       |           |           |            |          |      | °C |
|                                      |        | Maximum | 65        |           |           |            | 85       |      |    |

## Spacing and Insulation

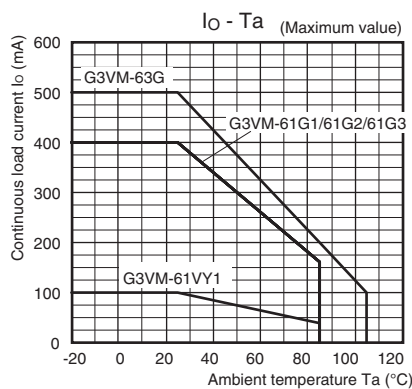
| Item                         | Minimum | Unit |
|------------------------------|---------|------|
| Creepage distances           | 4.0     | mm   |
| Clearance distances          | 4.0     |      |
| Internal isolation thickness | 0.1     |      |

## Engineering Data

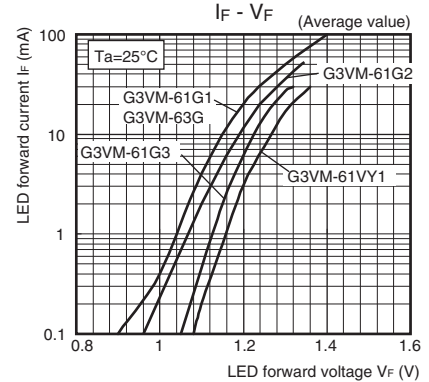
### LED forward current vs. Ambient temperature



### Continuous load current vs. Ambient temperature

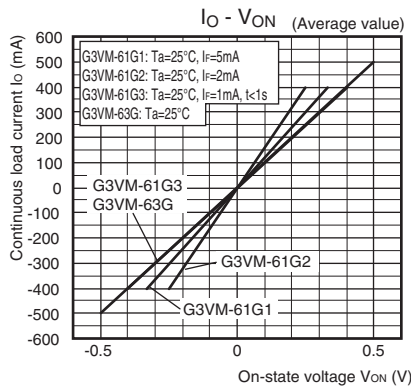


### LED forward current vs. LED forward voltage

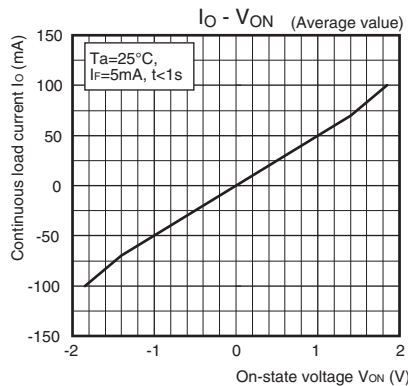


### Continuous load current vs. On-state voltage

G3VM-61G1/61G2/61G3/63G

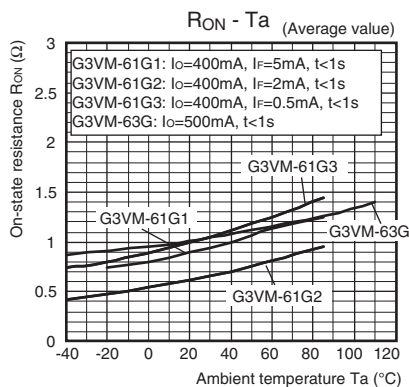


G3VM-61VY1

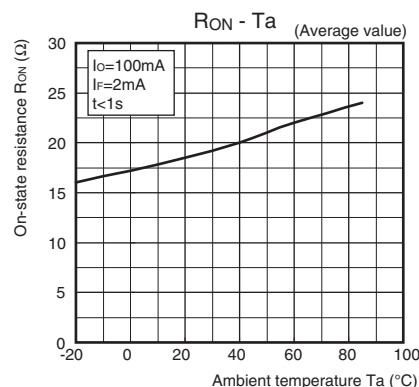


### On-state resistance vs. Ambient temperature

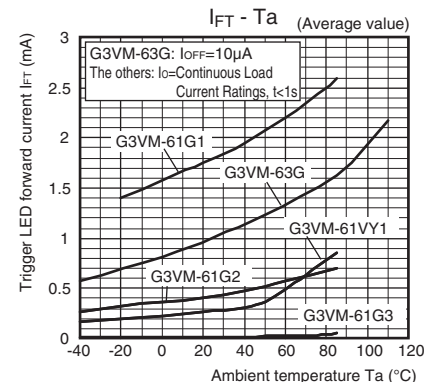
G3VM-61G1/61G2/61G3/63G



G3VM-61VY1

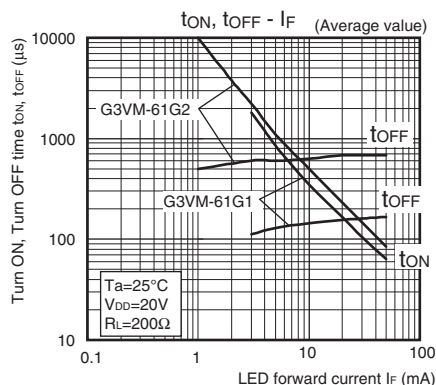


### Trigger LED forward current vs. Ambient temperature

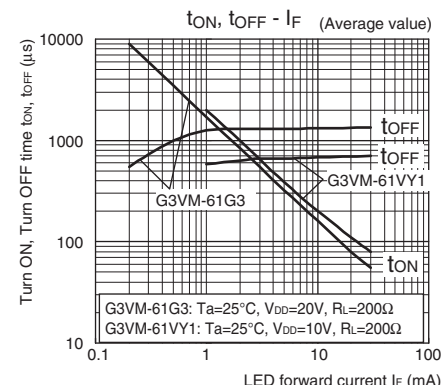


### Turn ON, Turn OFF time vs. LED forward current

G3VM-61G1/61G2

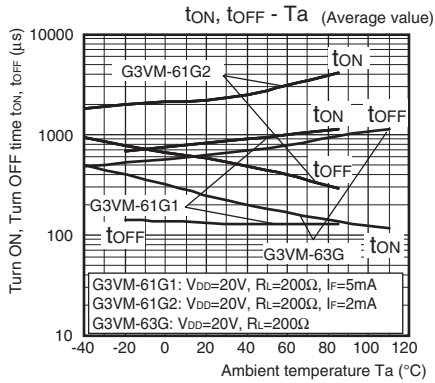


G3VM-61G3/61VY1

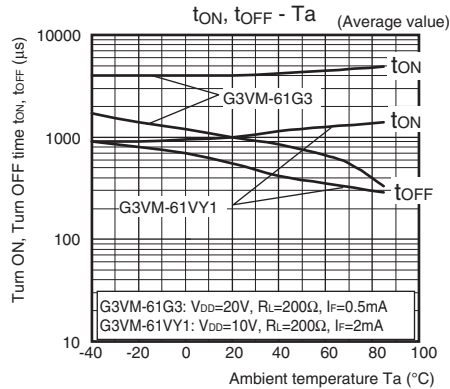


## Engineering Data

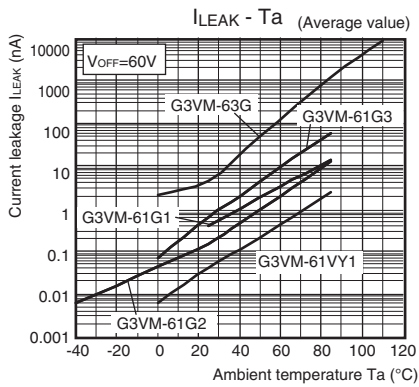
### ● Turn ON, Turn OFF time vs. Ambient temperature G3VM-61G1/61G2/63G



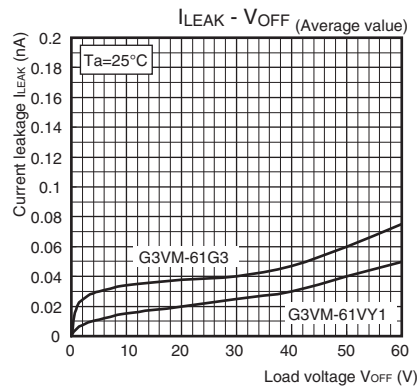
### G3VM-61G3/61VY1



### ● Current leakage vs. Ambient temperature



### ● Current leakage vs. Load voltage G3VM-61G3/61VY1

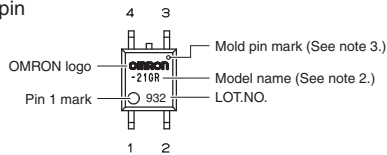


## Appearance/Terminal Arrangement/Internal Connections

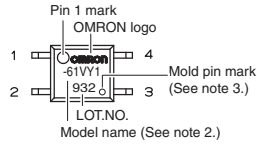
### ● Appearance

#### SOP (Small Outline Package)

SOP 4-pin



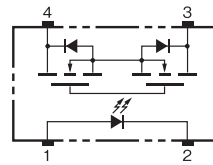
#### Special SOP 4-pin (G3VM-61VY1)



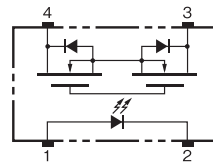
- Note: 1.** The actual product is marked differently from the image shown here.
- Note: 2.** "G3VM" does not appear in the model number on the Relay.
- Note: 3.** The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

### ● Terminal Arrangement/Internal Connections (Top View)

G3VM-61G1/61G2/61G3/61VY1



G3VM-63G



## ■ Dimensions (Unit: mm)

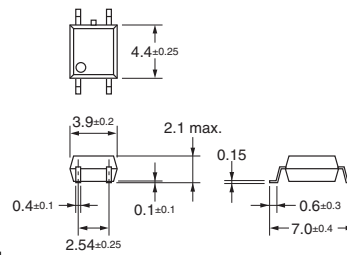
### SOP (Small Outline Package)

SOP 4-pin



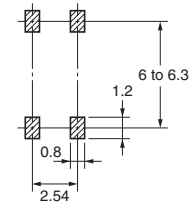
#### Surface-mounting Terminals

Weight: 0.1 g



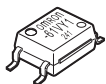
#### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



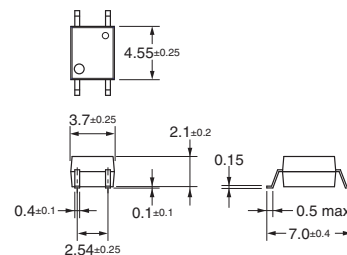
**Note:** The actual product is marked differently from the image shown here.

Special SOP 4-pin \*(G3VM-61VY1)



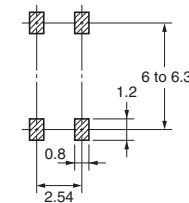
#### Surface-mounting Terminals

Weight: 0.1 g



#### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



\* The external dimensions are different from those of the standard SOP 4-pin, but the mounting pad dimensions are the same.

**Note:** The actual product is marked differently from the image shown here.

## ■ Approved Standards

UL recognized

| Model   | Approved Standards          | Contact form    | File No. |
|---|-----------------------------|-----------------|----------|
| G3VM-61G1<br>G3VM-61G2<br>G3VM-61G3<br>G3VM-61VY1 | UL recognized               | 1a<br>(SPST-NO) | E80555   |
| G3VM-63G  | UL certification is pending |                 |          |

## ■ Safety Precautions

- Refer to the *Common Precautions for All MOS FET Relays* for precautions that apply to all MOS FET Relays.

• Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.  
• Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

**Note: Do not use this document to operate the Unit.**

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Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

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