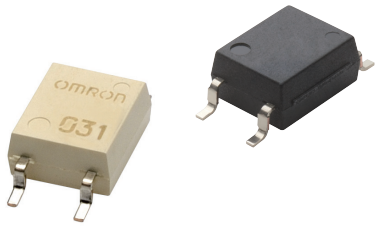
# G3VM-41GR8/61GR2/61VR

**MOS FET Relays SOP 4-pin, High-current and Low-ON-resistance Type**

## MOS FET Relays in SOP4-pin that featuring the low ON resistance and high switching capacity as a mechanical relay.

- **Load voltage: 40 V or 60 V**
- **40-V Relay: Continuous load current of 1 A max.**
- **60-V Relay: Continuous load current of 1.7 A max.**



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

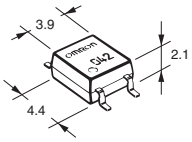


## ■Application Examples

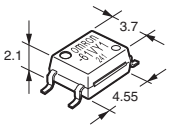
- **Semiconductor test equipment**
- **Test & Measurement equipment**
- **Communication equipment**
- **Security equipment**
- **Industrial equipment**
- **Power circuit**
- **Amusement equipment**

## ■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**
4 : 40 V
6 : 60 V

**2. Contact form**
1 : 1a (SPST-NO)

**3. Package**
G : SOP 4-pin
V: Special SOP 4-pin

**4. Additional function**
R: Low ON resistance

**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 | 40 V | 1000 mA | **G3VM-41GR8** | 100 pcs. | **G3VM-41GR8(TR)** | 2,500 pcs. |
| | | | 60 V | 1400 mA | **G3VM-61VR** | 125 pcs. | **G3VM-61VR(TR05)** | 500 pcs. |
| | | | | | | | **G3VM-61VR(TR)** | 3,000 pcs. |
| | | | | 1700 mA | **G3VM-61GR2** | 100 pcs. | **G3VM-61GR2(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-41GR8 | G3VM-61VR | G3VM-61GR2 | Unit | Measurement conditions |
|---|---|---|---|---|---|---|---|
| Input | LED forward current | $I_F$ | 30 | 50 | 30 | mA | |
| | LED forward current reduction rate | $\Delta I_F$/°C | -0.3 | -0.5 | -0.3 | mA/°C | Ta ≥ 25°C |
| | LED reverse voltage | $V_R$ | 5 | 6 | 5 | V | |
| | Connection temperature | $T_J$ | 125 | | | °C | |
| Output | Load voltage (AC peak/DC) | $V_{OFF}$ | 40 | 60 | | V | |
| | Continuous load current (AC peak/DC) | $I_O$ | 1000 | 1400 | 1700 | mA | |
| | ON current reduction rate | $\Delta I_O$/°C | -13.3 | -14 | -17 | mA/°C | G3VM-41GR8/61GR1: Ta ≥ 50°C<br>G3VM-61VR/61GR2: Ta ≥ 25°C |
| | Pulse ON current | $I_{op}$ | 2 | 4.2 | 5 | A | t=100 ms, Duty=1/10 |
| | Connection temperature | $T_J$ | 125 | | | °C | |
| Dielectric strength between I/O ✻ | | $V_{I-O}$ | 1500 | 3750 | 1500 | Vrms | AC for 1 min |
| Ambient operating temperature | | Ta | -40 to +85 | -40 to +110 | -40 to +85 | °C | With no icing or condensation |
| Ambient storage temperature | | Tstg | -55 to +125 | -40 to +125 | -55 to +125 | °C | |
| Soldering temperature | | – | 260 | | | °C | 10 s |

✻ 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.



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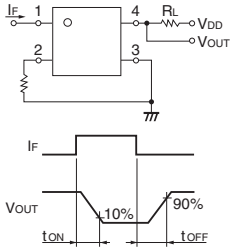
## ■Electrical Characteristics (Ta = 25°C)

| | Item | Symbol | | G3VM-41GR8 | G3VM-61VR | G3VM-61GR2 | Unit | Measurement conditions |
|---|---|---|---|---|---|---|---|---|
| Input | LED forward voltage | $V_F$ | Minimum | 1.18 | 1.1 | 1.18 | V | $I_F$=10 mA |
| | | | Typical | 1.33 | 1.27 | 1.33 | | |
| | | | Maximum | 1.48 | 1.4 | 1.48 | | |
| | Reverse current | $I_R$ | Maximum | 10 | | | μA | $V_R$=5 V |
| | Capacitance between terminals | $C_T$ | Typical | 70 | | | pF | V=0, f=1 MHz |
| | Trigger LED forward current | $I_{FT}$ | Typical | 1 | | 0.6 | mA | G3VM-41GR8/61GR2: $I_O$=100 mA<br>G3VM-61VR: $I_O$=1400 mA |
| | | | Maximum | 3 | | | | |
| | Release LED forward current | $I_{FC}$ | Minimum | 0.1 | | | mA | $I_{OFF}$=100 μA |
| Output | Maximum resistance with output ON | $R_{ON}$ | Typical | 0.1 | 0.13 | 0.08 | Ω | G3VM-41GR8: $I_F$=5mA, Io= Continuous load current ratings<br>G3VM-61GR2/61VR: $I_F$=5mA, Io= Continuous load current ratings, t<1s |
| | | | Maximum | 0.13 | 0.25 | 0.13 | | |
| | Current leakage when the relay is open | $I_{LEAK}$ | Typical | – | 2 | 1 | nA | G3VM-41GR8: $V_{OFF}$=30 V<br>G3VM-61VR/61GR2: $V_{OFF}$=60 V |
| | | | Maximum | 1 | 1000 | 10 | | |
| | Capacitance between terminals | $C_{OFF}$ | Typical | 300 | 100 | 250 | pF | V=0, f=1 MHz |
| Capacitance between I/O terminals | | $C_{I-O}$ | Typical | 0.8 | | | pF | f=1 MHz, $V_S$=0 V |
| Insulation resistance between I/O terminals | | $R_{I-O}$ | Minimum | 1000 | | | MΩ | $V_{I-O}$=500 VDC, RoH≤60% |
| | | | Typical | $10^8$ | | | | |
| Turn-ON time | | $t_{ON}$ | Typical | 1.2 | 2 | 0.7 | ms | $I_F$=5 mA, $R_L$=200 Ω, $V_{DD}$=20 V ✻ |
| | | | Maximum | 3 | | | | |
| Turn-OFF time | | $t_{OFF}$ | Typical | 0.2 | 0.1 | 0.1 | | |
| | | | Maximum | 0.5 | 1 | 0.5 | | |

✻ Turn-ON and Turn-OFF Times




## ■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-41GR8 | G3VM-61VR | G3VM-61GR2 | Unit |
|---|---|---|---|---|---|---|
| Load voltage (AC peak/DC) | $V_{DD}$ | Maximum | 32 | 48 | | V |
| Operating LED forward current | $I_F$ | Maximum | 5 | | | mA |
| | | Typical | 10 | 7.5 | 10 | |
| | | Maximum | 20 | 25 | | |
| Continuous load current (AC peak/DC) | $I_O$ | Maximum | 1000 | 1400 | 1300 | |
| Ambient operating temperature | Ta | Minimum | -20 | | | °C |
| | | Maximum | 60 | 100 | 65 | |

## ■Spacing and Insulation

| Item | G3VM-□GR□ | G3VM-61VR | Unit |
|---|---|---|---|
| | Minimum | | |
| Creepage distances | 4.0 | 5.0 | mm |
| Clearance distances | 4.0 | 5.0 | |
| Internal isolation thickness | 0.1 | 0.2 | |





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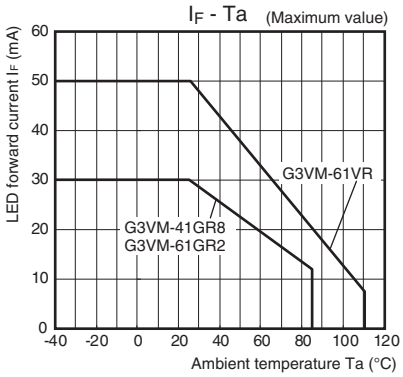
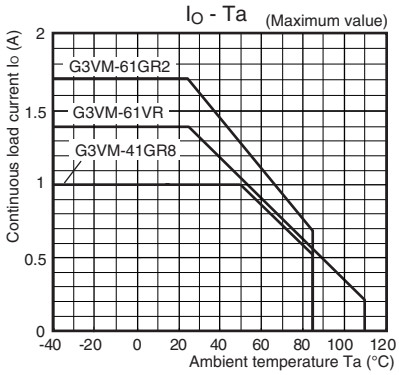
## ■Engineering Data

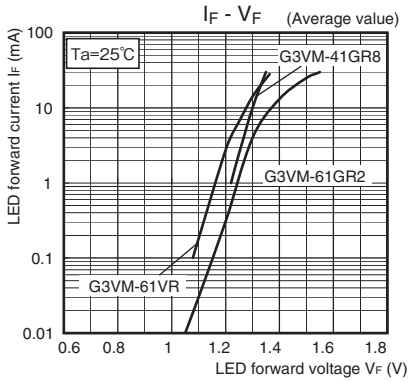
● **LED forward current vs. Ambient temperature**



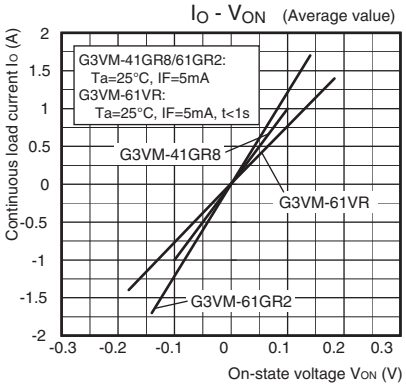

● **Continuous load current vs. Ambient temperature**



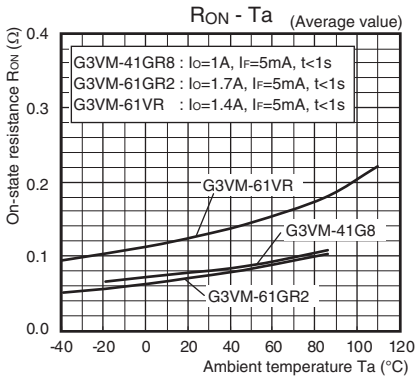

● **LED forward current vs. LED forward voltage**



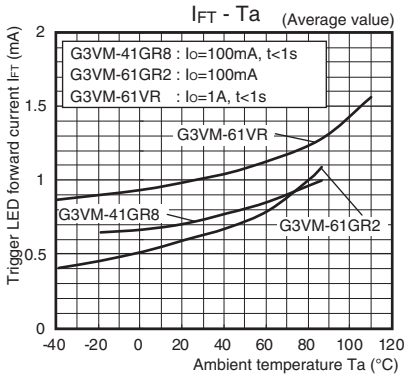

● **Continuous load current vs. On-state voltage**




● **On-state resistance vs. Ambient temperature**

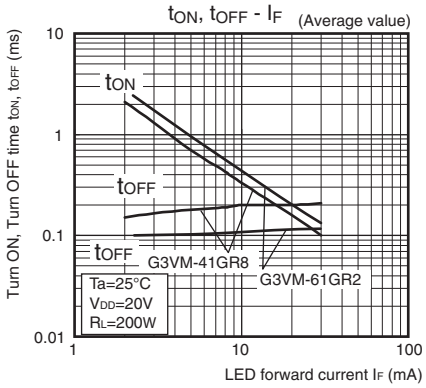



● **Trigger LED forward current vs. Ambient temperature**

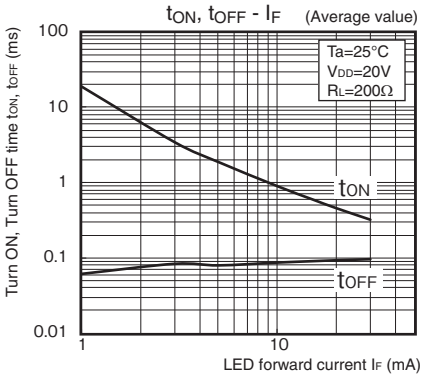



● **Turn ON, Turn OFF time vs. LED forward current**

G3VM-41GR8/61GR2

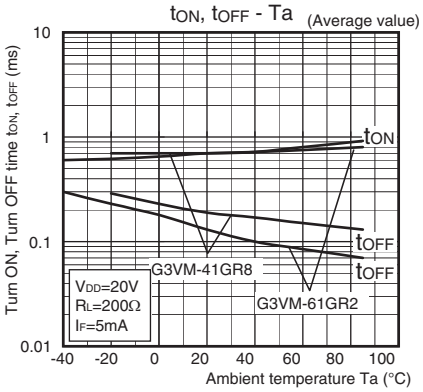



G3VM-61VR

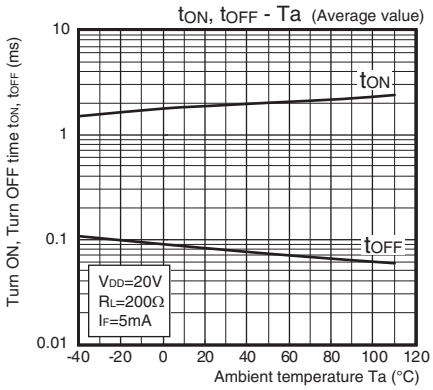



● **Turn ON, Turn OFF time vs. Ambient temperature**

G3VM-41GR8/61GR2

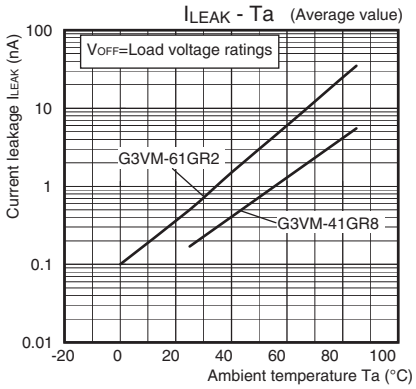



G3VM-61VR

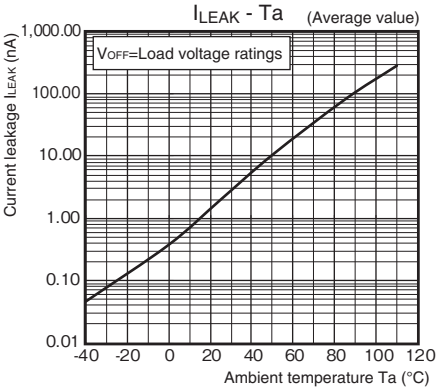



● **Current leakage vs. Ambient temperature**

G3VM-41GR8/61GR2




G3VM-61VR





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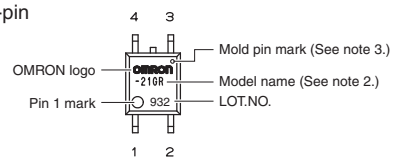
## ■Appearance / Terminal Arrangement / Internal Connections

### ●Appearance

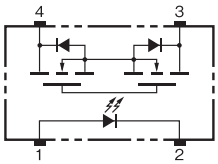
SOP (Small Outline Package)

SOP 4-pin




**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.

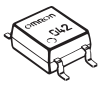
### ●Terminal Arrangement/Internal Connections (Top View)




## ■Dimensions (Unit: mm)

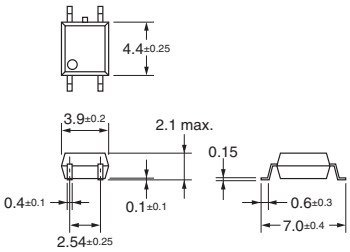
SOP (Small Outline Package)

SOP 4-pin



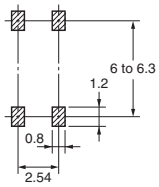
**Surface-mounting Terminals**

**Weight: 0.1 g**



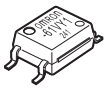

**Actual Mounting Pad Dimensions**

(Recommended Value, Top View)



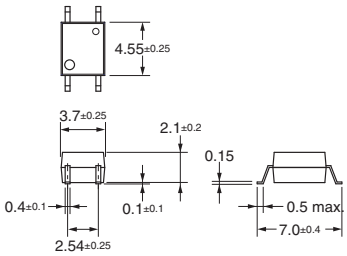

**Note:** The actual product is marked differently from the image shown here.

Special SOP 4-pin ✻ (G3VM-61VR)



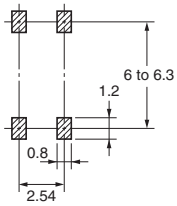
**Surface-mounting Terminals**

**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-41GR8<br>G3VM-61GR2<br>G3VM-61VR | UL (recognized) | 1a<br>(SPST-NO) | E80555 |

## ■Safety Precautions

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





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