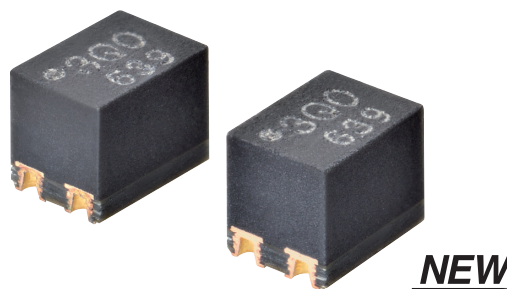


# G3VM-31QR/61QR2/101QR1

MOS FET Relays S-VSON 4-pin, High-current and Low-ON-resistance Type

## World's smallest \* class New S-VSON Package

- Load voltage 30 V/60 V/100 V.
- 30-V Relay: Continuous load current of 1.5 A max.
- 60-V Relay: Continuous load current of 1.0 A max.
- 100-V Relay: Continuous load current of 0.65 A max.
- High Ambient operating temperature: -40°C to +110°C



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

\* As of June 2017 Survey by OMRON.

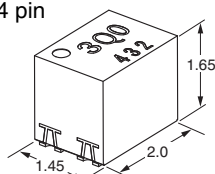
RoHS Compliant

## Application Examples

- Semiconductor test equipment
- Test & measurement equipment
- Communication equipment
- Data loggers

## Package (Unit : mm, Average)

S-VSON4 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

3: 30 V  
6: 60 V  
10: 100 V

### 2. Contact form Package type

1: 1a (SPST-NO)

### 3. Package type

Q: S-VSON 4 pin

### 5. Other informations

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

### 4. Additional functions

R: Low On-resistance

## Ordering Information

| Package type | Contact form | Terminals                  | Load voltage (peak value) * | Continuous load current (peak value) * | Packing/Tape cut |                          | Packing/Tape & reel |                          |
|--------------|--------------|----------------------------|-----------------------------|----------------------------------------|------------------|--------------------------|---------------------|--------------------------|
|              |              |                            |                             |                                        | Model            | Minimum package quantity | Model               | Minimum package quantity |
| S-VSON4      | 1a (SPST-NO) | Surface-mounting Terminals | 30 V                        | 1,500 mA                               | G3VM-31QR        | 1 pc.                    | G3VM-31QR (TR05)    | 500 pcs.                 |
|              |              |                            | 60 V                        | 1,000 mA                               | G3VM-61QR2       |                          | G3VM-61QR2 (TR05)   |                          |
|              |              |                            | 100 V                       | 650 mA                                 | G3VM-101QR1      |                          | G3VM-101QR1 (TR05)  |                          |

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

Note: When ordering tape packing, add "(TR05)" (500 pcs/reel) to the model number.

Ask your OMRON representative for orders under 500 pcs. We can supply products with the tape already cut.

Tape-cut S-VSON is packaged without humidity resistance. Use manual soldering to mount them.

Refer to common precautions.

G3VM-31QR

S-VSON

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

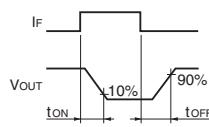
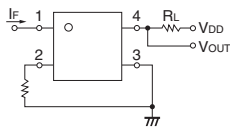
| Item                                          |                                      | Symbol              | G3VM-31QR   | G3VM-61QR2 | G3VM-101QR1 | Unit             | Measurement conditions        |
|-----------------------------------------------|--------------------------------------|---------------------|-------------|------------|-------------|------------------|-------------------------------|
| Input                                         | LED forward current                  | I <sub>F</sub>      | 30          |            |             | mA               |                               |
|                                               | LED forward current reduction rate   | ΔI <sub>F</sub> /°C | -0.3        |            |             | mA/°C            | Ta≥25°C                       |
|                                               | LED reverse voltage                  | V <sub>R</sub>      | 5           |            |             | V                |                               |
|                                               | Connection temperature               | T <sub>J</sub>      | 125         |            |             | °C               |                               |
| Output                                        | Load voltage (AC peak/DC)            | V <sub>OFF</sub>    | 30          | 60         | 100         | V                |                               |
|                                               | Continuous load current (AC peak/DC) | I <sub>O</sub>      | 1500        | 1000       | 650         | mA               |                               |
|                                               | ON current reduction rate            | ΔI <sub>O</sub> /°C | -15         | -10        | -6.5        | mA/°C            | Ta≥25°C                       |
|                                               | Pulse ON current                     | I <sub>OP</sub>     | 4.5         | 3          | 2           | A                | t=100 ms, Duty=1/10           |
|                                               | Connection temperature               | T <sub>J</sub>      | 125         |            |             | °C               |                               |
| Dielectric strength between I/O (See note 1.) |                                      | V <sub>I-O</sub>    | 500         |            |             | V <sub>rms</sub> | AC for 1 min                  |
| Ambient operating temperature                 |                                      | T <sub>a</sub>      | -40 to +110 |            |             | °C               | With no icing or condensation |
| Ambient storage temperature                   |                                      | T <sub>stg</sub>    | -40 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.

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

| Item                                        |                                        | Symbol            |                  | G3VM-31QR       | G3VM-61QR2 | G3VM-101QR1 | Unit                    | Measurement conditions                                                                                                                          |
|---------------------------------------------|----------------------------------------|-------------------|------------------|-----------------|------------|-------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Input                                       | LED forward voltage                    | V <sub>F</sub>    | Minimum          | 1.1             |            |             | V                       | I <sub>F</sub> =10 mA                                                                                                                           |
|                                             |                                        |                   | Typical          | 1.21            |            |             |                         |                                                                                                                                                 |
|                                             |                                        |                   | Maximum          | 1.4             |            |             |                         |                                                                                                                                                 |
|                                             | Reverse current                        | I <sub>R</sub>    | Maximum          | 10              |            |             | μA                      | V <sub>R</sub> =5 V                                                                                                                             |
|                                             | Capacity between terminals             | C <sub>T</sub>    | Typical          | 30              |            |             | pF                      | V=0, f=1 MHz                                                                                                                                    |
|                                             | Trigger LED forward current            | I <sub>FT</sub>   | Typical          | 0.6             | 0.7        |             | mA                      | I <sub>o</sub> =100 mA                                                                                                                          |
|                                             |                                        |                   | Maximum          | 3               |            |             |                         |                                                                                                                                                 |
| Release LED forward current                 | I <sub>FC</sub>                        | Minimum           | 0.1              |                 |            | mA          | I <sub>OFF</sub> =10 μA |                                                                                                                                                 |
| Output                                      | Maximum resistance with output ON      | R <sub>ON</sub>   | Typical          | 0.1             | 0.2        | 0.4         | Ω                       | G3VM-31QR/61QR2,<br>I <sub>o</sub> =1000 mA, I <sub>F</sub> =5 mA, t<1 s<br>G3VM-101QR1,<br>I <sub>o</sub> =650 mA, I <sub>F</sub> =5 mA, t<1 s |
|                                             |                                        |                   | Maximum          | 0.2             | 0.3        | 0.6         |                         |                                                                                                                                                 |
|                                             | Current leakage when the relay is open | I <sub>LEAK</sub> | Maximum          | 1               | 1000 (1)   |             | nA                      | V <sub>OFF</sub> =Load Voltage Ratings ( ) of 61QR2: V <sub>OFF</sub> =50 V, ( ) of 101QR1: V <sub>OFF</sub> =80 V                              |
|                                             | Capacity between terminals             | C <sub>OFF</sub>  | Typical          | 120             | 80         | 50          | pF                      | V=0, f=100 MHz, t<1 s                                                                                                                           |
|                                             |                                        |                   | Maximum          | —               | 150        | —           |                         |                                                                                                                                                 |
|                                             | Capacity between I/O terminals         |                   | C <sub>I-O</sub> | Typical         | 1          | 0.9         |                         | pF                                                                                                                                              |
| Insulation resistance between I/O terminals |                                        | R <sub>I-O</sub>  | Typical          | 10 <sup>8</sup> |            |             | MΩ                      | V <sub>I-O</sub> =500 VDC, R <sub>oH</sub> ≤60%                                                                                                 |
| Turn-ON time                                |                                        | t <sub>ON</sub>   | Typical          | 0.8             | 0.75       | 0.6         | ms                      | I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω,<br>V <sub>DD</sub> =20 V (See note 2.)                                                             |
|                                             |                                        |                   | Maximum          | 2               |            |             |                         |                                                                                                                                                 |
| Turn-OFF time                               |                                        | t <sub>OFF</sub>  | Typical          | 0.05            | 0.04       |             | ms                      |                                                                                                                                                 |
|                                             |                                        |                   | Maximum          | 1               | 0.3        |             |                         |                                                                                                                                                 |

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



## ■Recommended Operating Conditions

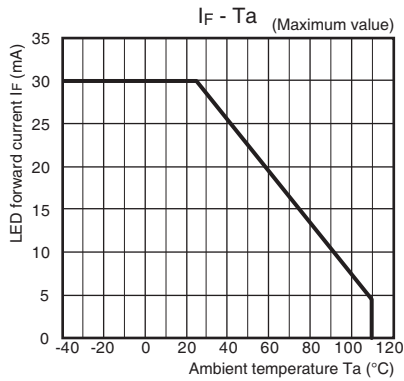
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

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

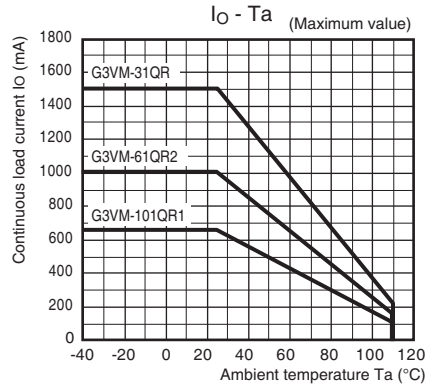
| Item                                 | Symbol          |         | G3VM-31QR | G3VM-61QR2 | G3VM-101QR1 | Unit |
|--------------------------------------|-----------------|---------|-----------|------------|-------------|------|
| Load voltage (AC peak/DC)            | V <sub>DD</sub> | Maximum | 24        | 48         | 80          | V    |
| Operating LED forward current        | I <sub>F</sub>  | Minimum | 5         |            |             | mA   |
|                                      |                 | Typical | 7.5       |            |             |      |
|                                      |                 | Maximum | 20        |            |             |      |
| Continuous load current (AC peak/DC) | I <sub>O</sub>  | Maximum | 1300      | 1000       | 650         |      |
| Ambient operating temperature        | T <sub>a</sub>  | Minimum | −20       |            |             | °C   |
|                                      |                 | Maximum | 100       |            |             |      |

## Engineering Data

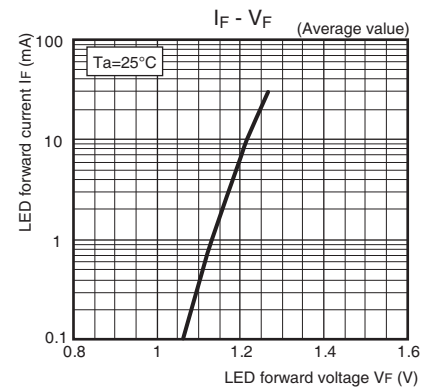
### LED forward current vs. Ambient temperature



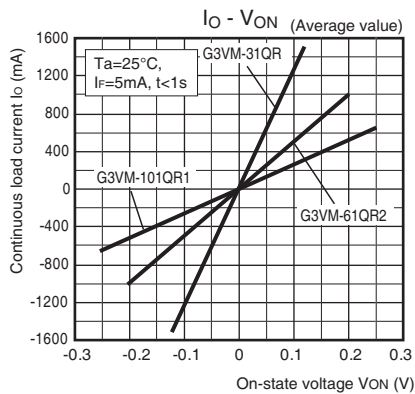
### Continuous load current vs. Ambient temperature



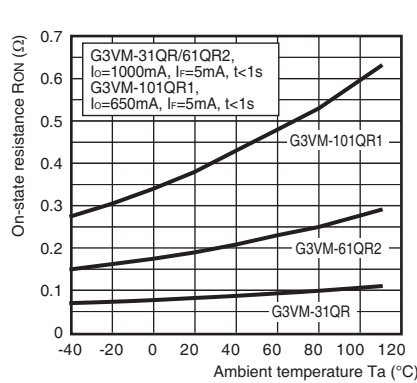
### LED forward current vs. LED forward voltage



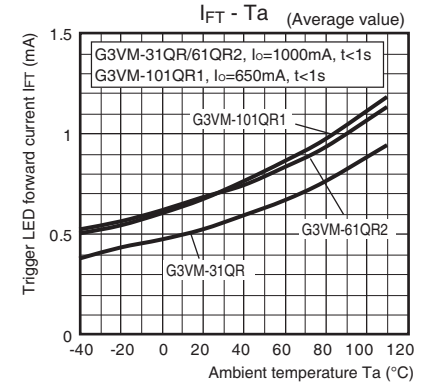
### Continuous load current vs. On-state voltage



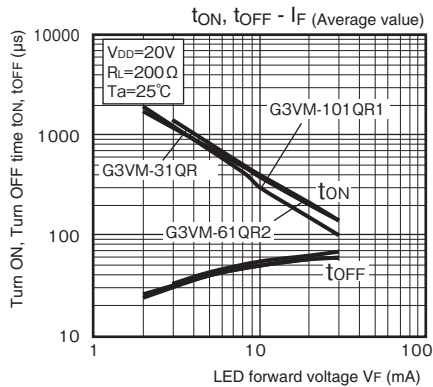
### On-state resistance vs. Ambient temperature



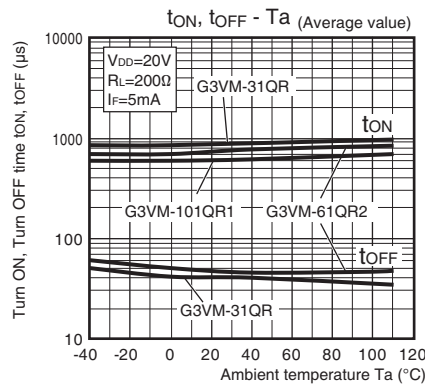
### Trigger LED forward current vs. Ambient temperature



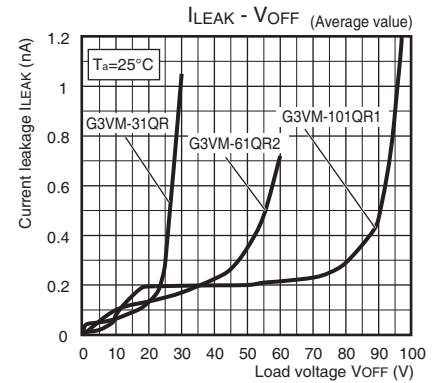
### Turn ON, Turn OFF time vs. LED forward current



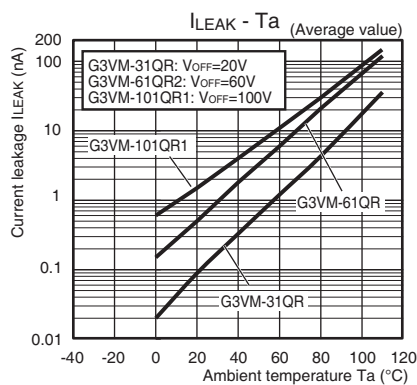
### Turn ON, Turn OFF time vs. Ambient temperature



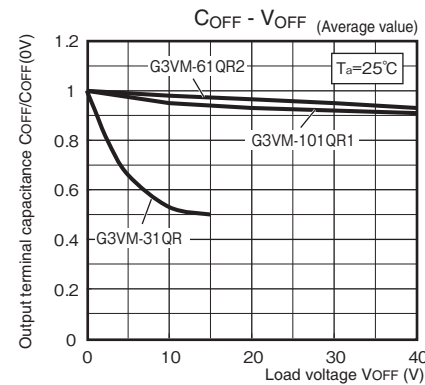
### Current leakage vs. Load voltage



### Current leakage vs. Ambient temperature



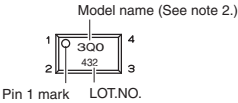
### Output terminal capacitance vs. Load voltage



■Appearance / Terminal Arrangement / Internal Connections

■Appearance

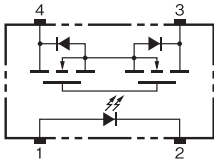
S-VSON (Super-Very Small Outline Non-leaded)  
S-VSON4 pin



\* Actual model name marking for each model

| Model       | Marking |
|-------------|---------|
| G3VM-31QR   | 3Q0     |
| G3VM-61QR2  | 6Q2     |
| G3VM-101QR1 | AQ1     |

■Terminal Arrangement/Internal Connections (Top View)

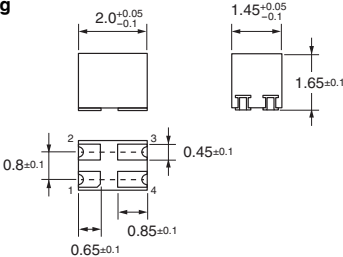
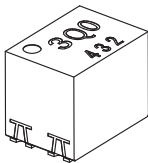


**Note 1.** The actual product is marked differently from the image shown here.  
**2.** "G3VM" does not appear in the model number on the Relay.

■Dimensions (Unit: mm)

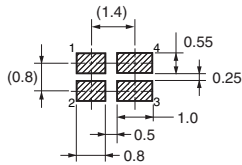
Surface-mounting Terminals

Weight: 0.01 g



Actual Mounting Pad Dimensions

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

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

■Safety Precautions

- Refer to "Common Precautions" for all G3VM models.

• 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.**