G3VM-31QR
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.
- Continuous load current 1.5 A max.

* As of November 2016 Survey by OMRON.

RoHS Compliant

Application Examples

- Semiconductor test equipment
- Communication equipment
- Test & measurement 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

1. Load Voltage
   3: 30 V

2. Contact form Package type
   1: 1a (SPST-NO)
   Q: S-VSON 4 pin

3. Package type
   Q: S-VSON 4 pin

4. Additional functions
   R: Low On-resistance

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

Ordering Information

<table>
<thead>
<tr>
<th>Package type</th>
<th>Contact form</th>
<th>Terminals</th>
<th>Load voltage (peak value)</th>
<th>Continuous load current (peak value)</th>
<th>Packing/Tape cut</th>
<th>Packing/Tape &amp; reel</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-VSON4</td>
<td>1a (SPST-NO)</td>
<td>Surface-mounting Terminals</td>
<td>30 V</td>
<td>1,500 mA</td>
<td>G3VM-31QR</td>
<td>G3VM-31QR (TR05)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 pc.</td>
<td>500 pcs.</td>
</tr>
</tbody>
</table>

* 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.

Note: The actual product is marked differently from the image shown here.
**Absolute Maximum Ratings (Ta = 25°C)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>G3VM-31QR</th>
<th>Unit</th>
<th>Measurement conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED forward current</td>
<td>$I_F$</td>
<td>50</td>
<td>mA</td>
<td>$I_F$=10 mA</td>
</tr>
<tr>
<td>LED forward current reduction rate</td>
<td>$\Delta I_F/°C$</td>
<td>-0.3</td>
<td>mA/°C</td>
<td>$Ta$=25°C</td>
</tr>
<tr>
<td>LED reverse voltage</td>
<td>$V_R$</td>
<td>5</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Connection temperature</td>
<td>$T_J$</td>
<td>125</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Load voltage (AC peak/DC)</td>
<td>$V_{OFF}$</td>
<td>30</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Continuous load current (AC peak/DC)</td>
<td>$I_O$</td>
<td>1500</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>ON current reduction rate</td>
<td>$\Delta I_O/°C$</td>
<td>-15</td>
<td>mA/°C</td>
<td>$Ta$=25°C</td>
</tr>
<tr>
<td>Pulse ON current</td>
<td>$I_{OP}$</td>
<td>4.5</td>
<td>A</td>
<td>$I_{OP}$=100 ms, $D=1/10$</td>
</tr>
<tr>
<td>Connection temperature</td>
<td>$T_J$</td>
<td>125</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength between I/O (See note 1.)</td>
<td>$V_{I-O}$</td>
<td>500</td>
<td>V</td>
<td>AC for 1 min</td>
</tr>
<tr>
<td>Ambient operating temperature</td>
<td>$T_a$</td>
<td>-40 to +110</td>
<td>°C</td>
<td>With no icing or condensation</td>
</tr>
<tr>
<td>Ambient storage temperature</td>
<td>$T_{stg}$</td>
<td>-40 to +125</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Soldering temperature</td>
<td>–</td>
<td>260</td>
<td>°C</td>
<td>10s</td>
</tr>
</tbody>
</table>

**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)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>G3VM-31QR</th>
<th>Unit</th>
<th>Measurement conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED forward voltage</td>
<td>$V_F$</td>
<td>Minimum</td>
<td>1.1</td>
<td>$V_{IF}=10$ mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typical</td>
<td>1.21</td>
<td>$V_{IF}=10$ mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum</td>
<td>1.4</td>
<td>$V_{IF}=10$ mA</td>
</tr>
<tr>
<td>Reverse current</td>
<td>$I_R$</td>
<td>Maximum</td>
<td>10</td>
<td>μA</td>
</tr>
<tr>
<td>Capacity between terminals</td>
<td>$C_T$</td>
<td>Typical</td>
<td>30</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typical</td>
<td>0.6</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum</td>
<td>3</td>
<td>mA</td>
</tr>
<tr>
<td>Release LED forward current</td>
<td>$I_{FR}$</td>
<td>Minimum</td>
<td>0.1</td>
<td>mA</td>
</tr>
<tr>
<td>Current leakage when the relay is open</td>
<td>$I_{LEAK}$</td>
<td>Maximum</td>
<td>1</td>
<td>nA</td>
</tr>
<tr>
<td>Capacity between terminals</td>
<td>$C_{OFF}$</td>
<td>Typical</td>
<td>120</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typical</td>
<td>1</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum</td>
<td>5</td>
<td>nA</td>
</tr>
<tr>
<td>Insulation resistance between I/O terminals</td>
<td>$R_{I-O}$</td>
<td>Typical</td>
<td>$10^6$</td>
<td>MΩ</td>
</tr>
<tr>
<td>Turn-ON time</td>
<td>$T_{ON}$</td>
<td>Typical</td>
<td>0.8</td>
<td>ms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum</td>
<td>2</td>
<td>ms</td>
</tr>
</tbody>
</table>

**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.
# 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. Ambient temperature**
- **On-state voltage 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**
- **Output terminal capacitance vs. Load voltage**

### LED forward current vs. Ambient temperature
![LED forward current vs. Ambient temperature](image1)

- **Continuous load current vs. Ambient temperature**
- **On-state resistance vs. Ambient temperature**
- **Trigger LED forward current vs. Ambient temperature**
- **Turn ON, Turn OFF time vs. Ambient temperature**
- **Current leakage vs. Load voltage**
- **Output terminal capacitance vs. Load voltage**

### Continuous load current vs. Ambient temperature
![Continuous load current vs. Ambient temperature](image2)

- **On-state voltage vs. Ambient temperature**
- **Trigger LED forward current vs. Ambient temperature**
- **Turn ON, Turn OFF time vs. Ambient temperature**
- **Current leakage vs. Load voltage**
- **Output terminal capacitance vs. Load voltage**

### On-state resistance vs. Ambient temperature
![On-state resistance vs. Ambient temperature](image3)

- **Trigger LED forward current vs. Ambient temperature**
- **Turn ON, Turn OFF time vs. Ambient temperature**
- **Current leakage vs. Load voltage**
- **Output terminal capacitance vs. Load voltage**

### Trigger LED forward current vs. Ambient temperature
![Trigger LED forward current vs. Ambient temperature](image4)

- **Turn ON, Turn OFF time vs. Ambient temperature**
- **Current leakage vs. Load voltage**
- **Output terminal capacitance vs. Load voltage**

### Turn ON, Turn OFF time vs. LED forward current
![Turn ON, Turn OFF time vs. LED forward current](image5)

- **Turn ON, Turn OFF time vs. Ambient temperature**
- **Current leakage vs. Load voltage**
- **Output terminal capacitance vs. Load voltage**

### Current leakage vs. Ambient temperature
![Current leakage vs. Ambient temperature](image6)

- **Output terminal capacitance vs. Load voltage**

### Output terminal capacitance vs. Load voltage
![Output terminal capacitance vs. Load voltage](image7)
[Appearance / Terminal Arrangement / Internal Connections]

- **Appearance**

  **S-VSON (Super-Very Small Outline Non-leaded)**
  
  Model name (See note 2.)
  
  Actual model name marking for each model
  
<table>
<thead>
<tr>
<th>Model</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>G3VM-31QR</td>
<td>3Q0</td>
</tr>
</tbody>
</table>
  
  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.

- **Terminal Arrangement/Internal Connections**

  (Top View)

- **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.