

## MOS FET Relays

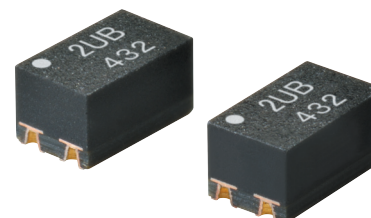
## G3VM-41UR10/51UR

**World's Smallest New VSON Package with Low Output Capacitance and Low ON Resistance (Low  $C \times R$ )**

- RoHS Compliant

### ■ Application Examples

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



**NEW**

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

### ■ List of Models

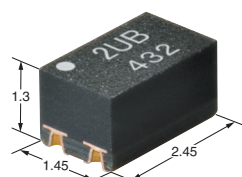
| Package type | Contact form     | Terminals                  | Load voltage (peak value) | Continuous Load Current (peak value) | Model             | Minimum Packaging Quantity |
|--------------|------------------|----------------------------|---------------------------|--------------------------------------|-------------------|----------------------------|
| VSON4        | SPST-NO (1FormA) | Surface-mounting terminals | 40 VAC or VDC             | 120 mA                               | G3VM-41UR10       | ---                        |
|              |                  |                            |                           |                                      | G3VM-41UR10(TR05) | 500                        |
|              |                  |                            | 50 VAC or VDC             | 300 mA                               | G3VM-51UR         | ---                        |
|              |                  |                            |                           |                                      | G3VM-51UR(TR05)   | 500                        |

**Note:** G3VM-41UR10 and G3VM-51UR, without "(TR05)", are provided as a Tape-cut versions, for sample purposes. Tape-cut VSON's are packaged without humidity resistance. Use manual soldering to mount them.

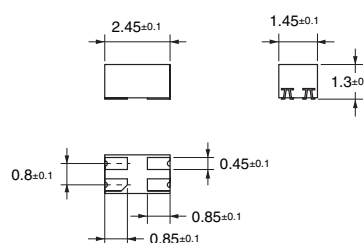
### ■ Dimensions

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

G3VM-41UR10  
G3VM-51UR



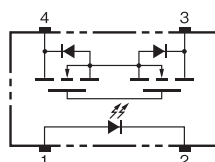
**Note:** The actual product is marked differently from the image shown here.



Weight: 0.01 g

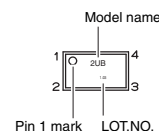
### ■ Terminal Arrangement/Internal Connections (Top View)

G3VM-41UR10  
G3VM-51UR



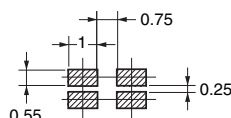
**Note:** The actual product is marked differently from the image shown here.

VSON (Very Small Outline Non-leaded)  
VSON4



### ■ Actual Mounting Pad Dimensions (Recommended Value, Top View)

G3VM-41UR10  
G3VM-51UR



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

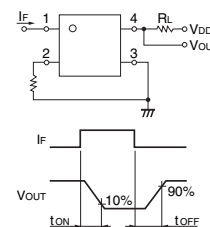
| Item                                                       | Symbol                             | G3VM-41UR10                    | G3VM-51UR   | Unit      | Measurement Conditions        |
|------------------------------------------------------------|------------------------------------|--------------------------------|-------------|-----------|-------------------------------|
| Input                                                      | LED forward current                | $I_F$                          | 30          | mA        |                               |
|                                                            | LED forward current reduction rate | $\Delta I_F/^\circ\text{C}$    | -0.3        | mA/°C     | $T_a \geq 25^\circ\text{C}$   |
|                                                            | LED reverse voltage                | $V_R$                          | 5           | V         |                               |
|                                                            | Connection temperature             | $T_J$                          | 125         | °C        |                               |
| Output                                                     | Load voltage (AC peak/DC)          | $V_{OFF}$                      | 40          | 50        | V                             |
|                                                            | Continuous load current            | $I_O$                          | 120         | 300       | mA                            |
|                                                            | ON current reduction rate          | $\Delta I_{ON}/^\circ\text{C}$ | -1.2        | -3        | mA/°C                         |
|                                                            | Pulse ON current                   | $I_{OP}$                       | 360         | 900       | mA                            |
|                                                            | Connection temperature             | $T_J$                          | 125         | °C        | $t=100\text{ms}$ , Duty=1/10  |
| Dielectric strength between input and output (See note 1.) |                                    | $V_{I-O}$                      | 300         | $V_{rms}$ | AC for 1 min                  |
| Ambient operating temperature                              |                                    | $T_a$                          | -40 to +85  | °C        | With no icing or condensation |
| Ambient storage temperature                                |                                    | $T_{stg}$                      | -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.

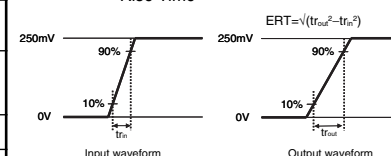
## Electrical Characteristics (Ta = 25°C)

| Item                                        | Symbol                                 | G3VM-41UR10 | G3VM-51UR | Unit       | Measurement conditions                          |
|---------------------------------------------|----------------------------------------|-------------|-----------|------------|-------------------------------------------------|
| Input                                       | LED forward voltage                    | Minimum     | 1.1       | V          | $I_F = 10\text{ mA}$                            |
|                                             |                                        | Typical     | 1.27      |            |                                                 |
|                                             |                                        | Maximum     | 1.4       |            |                                                 |
|                                             | Reverse current                        | $I_R$       | Maximum   | 10         | $\mu\text{A}$                                   |
|                                             | Capacity between terminals             | $C_T$       | Typical   | 30         | pF                                              |
| Output                                      | Trigger LED forward current            | $I_{FT}$    | Maximum   | 3.0        | mA                                              |
|                                             | Release LED forward current            | $I_{FC}$    | Minimum   | 0.1        | mA                                              |
|                                             | Maximum resistance with output ON      | Typical     | 12        | 1          | $\Omega$                                        |
|                                             |                                        | Maximum     | 14        | 1.5        |                                                 |
|                                             | Current leakage when the relay is open | $I_{LEAK}$  | Maximum   | 1          | nA                                              |
| Capacity between terminals                  | $C_{OFF}$                              | Typical     | 0.45      | 12         | pF                                              |
|                                             |                                        | Maximum     | 0.8       | 20         |                                                 |
| Capacity between I/O terminals              | $C_{I-O}$                              | Typical     | 1         | pF         | $f = 1\text{ MHz}$ , $V_s = 0\text{ V}$         |
| Insulation resistance between I/O terminals | $R_{I-O}$                              | Typical     | $10^8$    | M $\Omega$ | $V_{I-O} = 500\text{ VDC}$ , $R_{oh} \leq 60\%$ |
| Turn-ON time                                | $t_{ON}$                               | Maximum     | 0.2       | 0.5        | ms                                              |
| Turn-OFF time                               | $t_{OFF}$                              | Maximum     | 0.3       | 0.4        | ms                                              |
| Equivalent rise time                        | ERT                                    | Typical     | ---       | 40         | ps                                              |
|                                             |                                        | Maximum     | ---       | 90         |                                                 |

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



**Note: 3.** Equivalent Rise Time



## Recommended Operating Conditions

For usage with high reliability, the Recommended Operating Conditions are measures that takes into account the derating of the Absolute Maximum ratings and the Electrical Characteristics. Each item on this list is an independent condition, not simultaneously satisfying several conditions.

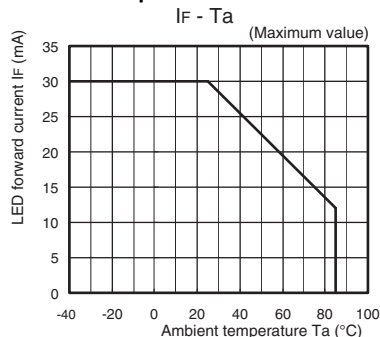
| Item                                 | Symbol   | G3VM-41UR10 | G3VM-51UR | Unit |
|--------------------------------------|----------|-------------|-----------|------|
| Load voltage (AC peak/DC)            | $V_{DD}$ | Maximum     | 32        | 40   |
| Operating LED forward current        | $I_F$    | Minimum     | 5         | mA   |
|                                      |          | Typical     | 7.5       |      |
|                                      |          | Maximum     | 20        |      |
| Continuous load current (AC peak/DC) | $I_O$    | Maximum     | 120       | 300  |
| Ambient Operating temperature        | $T_a$    | Minimum     | -20       | °C   |
|                                      |          | Maximum     | 65        |      |

## ■ Approved Standards

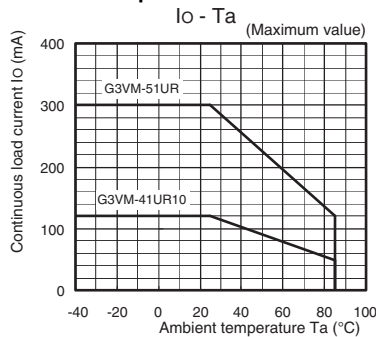
Applying for UL recognition

## ■ Engineering Data

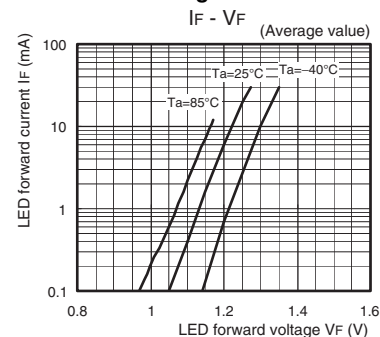
### LED forward current vs. Ambient temperature



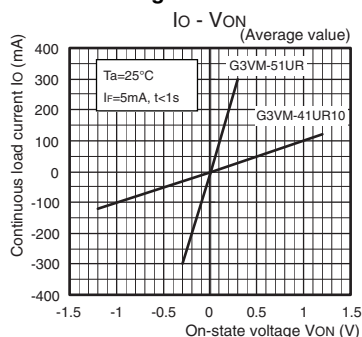
### Continuous load current vs. Ambient temperature



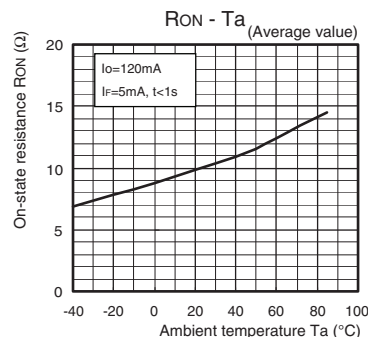
### LED forward current vs. LED forward voltage



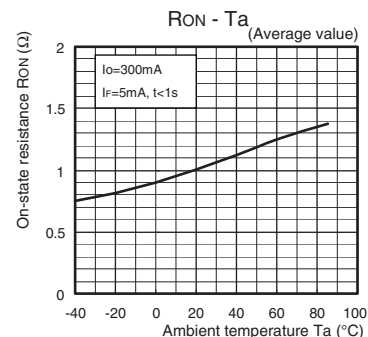
### Continuous load current vs. On-state voltage



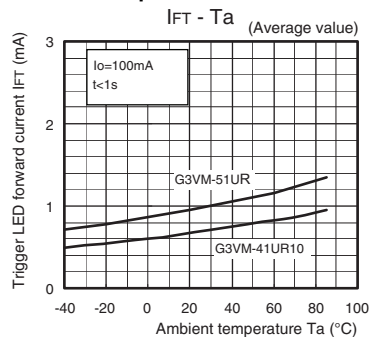
### On-state resistance vs. Ambient temperature



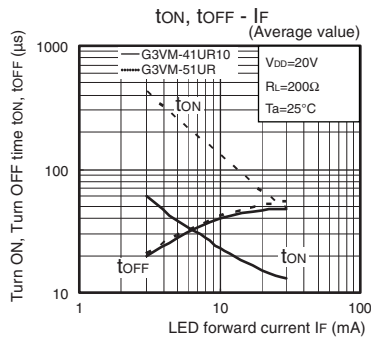
### G3VM-51UR



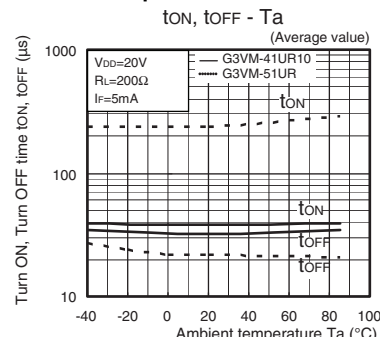
### Trigger LED forward current vs. Ambient temperature



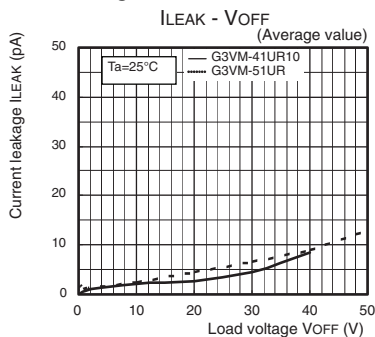
### Turn ON, Turn OFF time vs. LED forward current



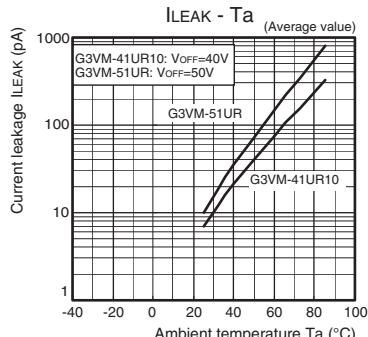
### Turn ON, Turn OFF time vs. Ambient temperature



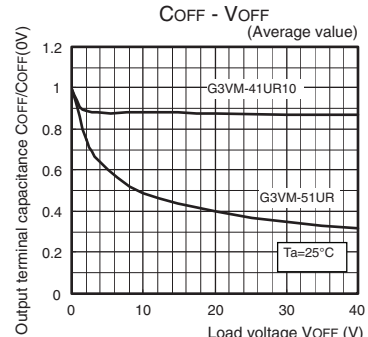
### Current leakage vs. Load voltage



### Current Leakage vs. Ambient Temperature



### Output terminal capacitance vs. Load voltage



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**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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