

# MOS FET Relays

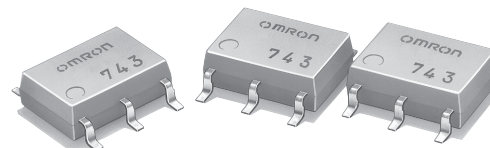
## G3VM-81HR

**High-capacity MOS FET Relay Allowing Switching of a 1.25-A Continuous Load Current with a 80-V Load Voltage, 6-pin SOP Package.**

- Continuous load current of 1,250 mA.
- Dielectric strength of 1,500 Vrms between I/O.
- RoHS Compliant.

### ■ Application Examples

- Broadband systems
- Measurement devices
- Data loggers
- Amusement machines



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

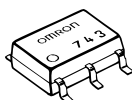
### ■ List of Models

| Contact form | Terminals                  | Load voltage (peak value) | Model         | Number per stick | Number per tape |
|--------------|----------------------------|---------------------------|---------------|------------------|-----------------|
| SPST-NO      | Surface-mounting terminals | 80 VAC                    | G3VM-81HR     | 75               | ---             |
|              |                            |                           | G3VM-81HR(TR) | ---              | 2,500           |

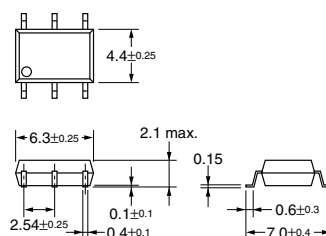
### ■ Dimensions

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

#### G3VM-81HR



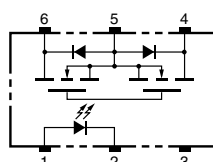
**Note:** The actual product is marked differently from the image shown here.



Weight: 0.13 g

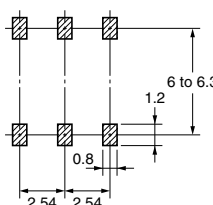
### ■ Terminal Arrangement/Internal Connections (Top View)

#### G3VM-81HR



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

#### G3VM-81HR



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

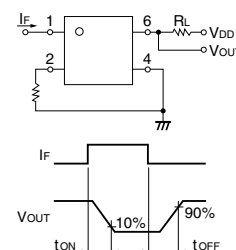
| Item                                                       |                                     | Symbol                | Rating      | Unit             | Measurement conditions        |
|------------------------------------------------------------|-------------------------------------|-----------------------|-------------|------------------|-------------------------------|
| Input                                                      | LED forward current                 | I <sub>F</sub>        | 50          | mA               |                               |
|                                                            | Repetitive peak LED forward current | I <sub>FP</sub>       | 1           | A                | 100 μs pulses, 100 pps        |
|                                                            | LED forward current reduction rate  | Δ I <sub>F</sub> /°C  | −0.5        | mA/°C            | T <sub>a</sub> ≥ 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>      | 80          | V                |                               |
|                                                            | Continuous load current             | I <sub>O</sub>        | 1,250       | mA               |                               |
|                                                            | ON current reduction rate           | Δ I <sub>ON</sub> /°C | −12.5       | mA/°C            | T <sub>a</sub> ≥ 25°C         |
|                                                            | Connection temperature              | T <sub>j</sub>        | 125         | °C               |                               |
| Dielectric strength between input and output (See note 1.) |                                     | V <sub>I-O</sub>      | 1,500       | V <sub>rms</sub> | AC for 1 min                  |
| Operating temperature                                      |                                     | T <sub>a</sub>        | −20 to +85  | °C               | With no icing or condensation |
| Storage temperature                                        |                                     | T <sub>stg</sub>      | −40 to +125 | °C               | With no icing or condensation |
| Soldering temperature (10 s)                               |                                     | ---                   | 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                                 | Minimum    | Typical | Maximum | Unit  | Measurement conditions |
|--------------------------------|----------------------------------------|------------|---------|---------|-------|------------------------|
| Input                          | LED forward voltage                    | $V_F$      | 1.0     | 1.15    | 1.3   | V                      |
|                                | Reverse current                        | $I_R$      | ---     | ---     | 10    | $\mu\text{A}$          |
|                                | Capacity between terminals             | $C_T$      | ---     | 15      | ---   | pF                     |
|                                | Trigger LED forward current            | $I_{FT}$   | ---     | 2       | 5     | mA                     |
| Output                         | Maximum resistance with output ON      | $R_{ON}$   | ---     | 0.11    | 0.15  | $\Omega$               |
|                                | Current leakage when the relay is open | $I_{LEAK}$ | ---     | 1.2     | 1.5   | nA                     |
|                                | Capacity between terminals             | $C_{OFF}$  | ---     | 460     | 1,000 | pF                     |
| Capacity between I/O terminals |                                        | $C_{I-O}$  | ---     | 0.8     | ---   | pF                     |
| Insulation resistance          |                                        | $R_{I-O}$  | 1,000   | ---     | ---   | M $\Omega$             |
| Turn-ON time                   |                                        | $t_{ON}$   | ---     | 2.0     | 3.0   | ms                     |
| Turn-OFF time                  |                                        | $t_{OFF}$  | ---     | 0.7     | 1.0   | ms                     |

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



## Recommended Operating Conditions

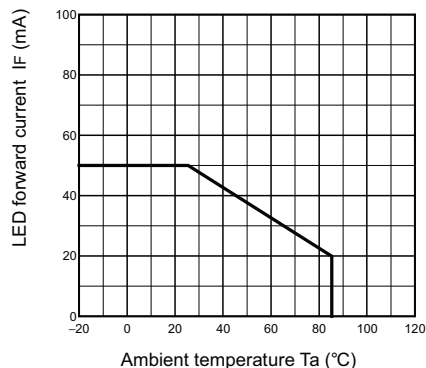
Use the G3VM under the following conditions so that the Relay will operate properly.

| Item                                 | Symbol   | Minimum | Typical | Maximum | Unit |
|--------------------------------------|----------|---------|---------|---------|------|
| Load voltage (AC peak/DC)            | $V_{DD}$ | ---     | ---     | 64      | V    |
| Operating LED forward current        | $I_F$    | 5       | ---     | 30      | mA   |
| Continuous load current (AC peak/DC) | $I_O$    | ---     | ---     | 1,250   | mA   |
| Operating temperature                | $T_a$    | 25      | ---     | 60      | °C   |

# ■ Engineering Data

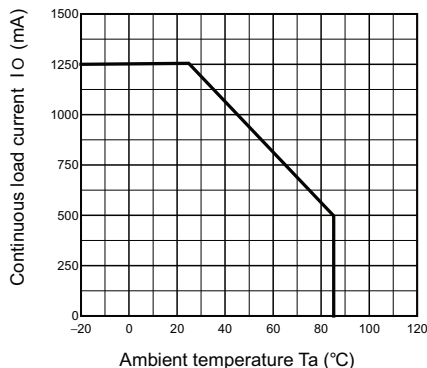
**LED forward current vs. Ambient temperature**

$I_F - T_a$



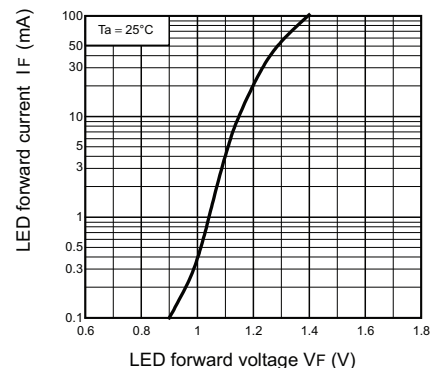
**Continuous load current vs. Ambient temperature**

$I_O - T_a$



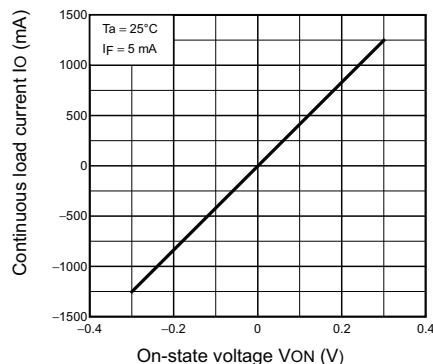
**LED forward current vs. LED forward voltage**

$I_F - V_F$



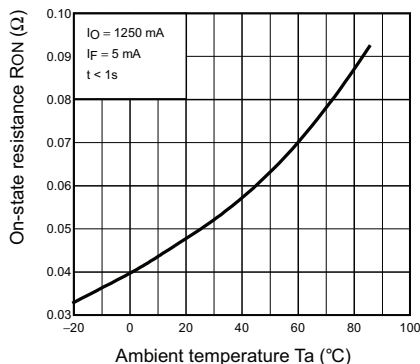
**Continuous load current vs. On-state voltage**

$I_O - V_{ON}$



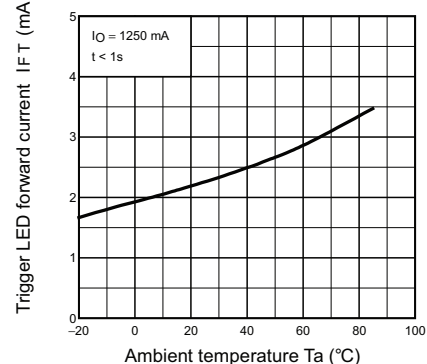
**On-state resistance vs. Ambient temperature**

$R_{ON} - T_a$



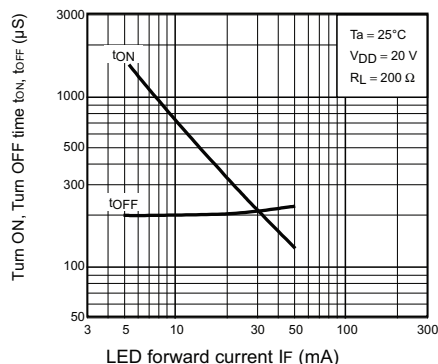
**Trigger LED forward current vs. Ambient temperature**

$I_{FT} - T_a$



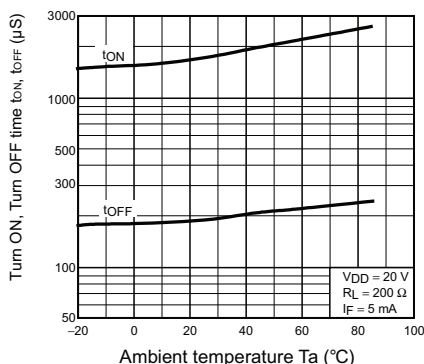
**Turn ON, Turn OFF time vs. LED forward current**

$t_{ON}, t_{OFF} - I_F$



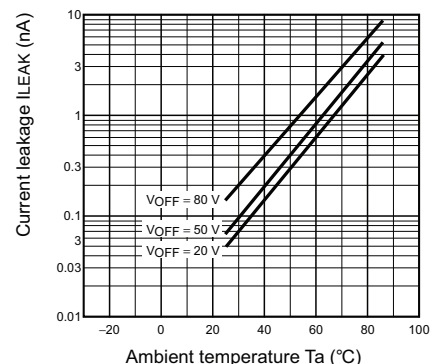
**Turn ON, Turn OFF time vs. Ambient temperature**

$t_{ON}, t_{OFF} - T_a$



**Current leakage vs. Ambient temperature**

$I_{LEAK} - T_a$



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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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