

MOS FET Relays

G3VM-41LR10

World's Smallest SSOP Package MOS FET Relay (C_{OFF} (typical): 0.45 pF, R_{ON} (typical): 12 Ω) with Low Output Capacitance and ON Resistance ($C \times R = 5 \text{ pF} \cdot \Omega$) in a 40-V Load Voltage Model

- Output capacitance of 0.45 pF (typical) allows high frequency applications.

Note: Information correct as of November 2005, according to data obtained by OMRON.

RoHS compliant

⚠ Refer to *Common precautions*.

Application Examples

- Semiconductor inspection tools
- Measurement devices
- Broadband systems
- Data loggers

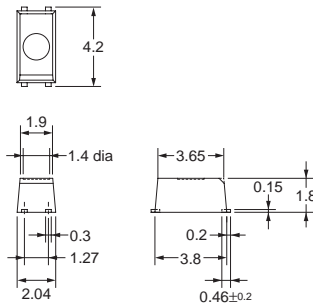
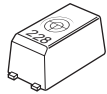
List of Models

| Contact form | Terminals | Load voltage (peak value) | Model | Minimum packaging unit |
|--------------|----------------------------|---------------------------|-----------------|------------------------|
| | | | | Number per tape |
| SPST-NO | Surface-mounting terminals | 40 VAC | G3VM-41LR10 | --- |
| | | | G3VM-41LR10(TR) | 1,500 |

Dimensions

Note: All units are in millimeters unless otherwise indicated.

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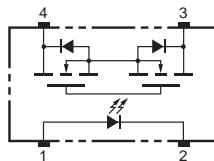
Note: A tolerance of ± 0.1 mm applies to all dimensions unless otherwise specified.

Weight: 0.03 g

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

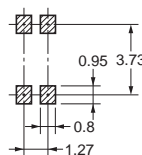
Terminal Arrangement/Internal Connections (Top View)

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Actual Mounting Pad Dimensions (Recommended Value, Top View)

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Absolute Maximum Ratings (Ta = 25°C)

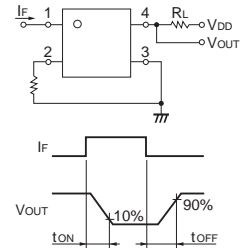
| Item | Symbol | Rating | Unit | Measurement Conditions | |
|--|------------------------------------|--------------------------------|-------------|------------------------|-------------------------------|
| Input | LED forward current | I_F | 30 | mA | |
| | LED forward current reduction rate | $\Delta I_F/^\circ\text{C}$ | -0.3 | mA/°C | Ta ≥ 25°C |
| | LED reverse voltage | V_R | 5 | V | |
| | Connection temperature | T_j | 125 | °C | |
| Output | Output dielectric strength | V_{OFF} | 40 | V | |
| | Continuous load current | I_O | 120 | mA | |
| | ON current reduction rate | $\Delta I_{ON}/^\circ\text{C}$ | -1.2 | mA/°C | Ta ≥ 25°C |
| | Connection temperature | T_j | 125 | °C | |
| Dielectric strength between input and output (See note 1.) | | V_{I-O} | 1,500 | Vrms | AC for 1 min |
| Ambient operating temperature | | T_a | -20 to +85 | °C | With no icing or condensation |
| Storage temperature | | T_{stg} | -40 to +125 | °C | With no icing or condensation |
| 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 | Minimum | Typical | Maximum | Unit | Measurement conditions | |
|---|--|------------|---------|---------|------|------------------------|---|
| Input | LED forward voltage | V_F | 1.15 | 1.35 | 1.45 | V | $I_F = 5 \text{ mA}$ |
| | Reverse current | I_R | --- | --- | 10 | μA | $V_R = 5 \text{ V}$ |
| | Capacity between terminals | C_T | --- | 70 | --- | pF | $V = 0, f = 1 \text{ MHz}$ |
| | Trigger LED forward current | I_{FT} | --- | --- | 3 | mA | $I_O = 100 \text{ mA}$ |
| Output | Maximum resistance with output ON | R_{ON} | --- | 12 | 14 | Ω | $I_F = 5 \text{ mA}, I_O = 120 \text{ mA}, t < 1 \text{ s}$ |
| | Current leakage when the relay is open | I_{LEAK} | --- | 10 | 200 | pA | $V_{OFF} = 35 \text{ V}, T_a = 25^\circ\text{C}$ |
| | Capacity between terminals | C_{OFF} | --- | 0.45 | 0.8 | pF | $V = 0, f = 100 \text{ MHz}, t = < 1 \text{ s}$ |
| Capacity between I/O terminals | | C_{I-O} | --- | 0.3 | --- | pF | $f = 1 \text{ MHz}, V_s = 0 \text{ V}$ |
| Insulation resistance between I/O terminals | | R_{I-O} | 1,000 | --- | --- | MΩ | $V_{I-O} = 500 \text{ VDC}, \text{RoH} \leq 60\%$ |
| Turn-ON time | | t_{ON} | --- | --- | 0.2 | ms | $I_F = 5 \text{ mA}, R_L = 200 \Omega, V_{DD} = 10 \text{ V}$ (See note 2.) |
| Turn-OFF time | | t_{OFF} | --- | --- | 0.3 | ms | |

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



Recommended Operating Conditions

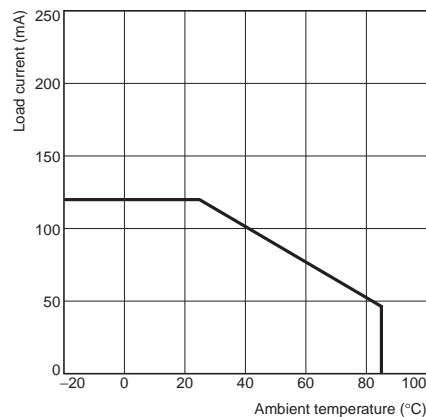
Use the G3VM under the following conditions so that the Relay will operate properly.

| Item | Symbol | Minimum | Typical | Maximum | Unit |
|-------------------------------|----------|---------|---------|---------|------|
| Output dielectric strength | V_{DD} | --- | --- | 32 | V |
| Operating LED forward current | I_F | --- | --- | 20 | mA |
| Continuous load current | I_O | --- | --- | 120 | mA |
| Operating temperature | T_a | 25 | --- | 60 | °C |

Engineering Data

Load Current vs. Ambient Temperature

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Safety Precautions

Refer to *Common precautions* for all G3VM models.