

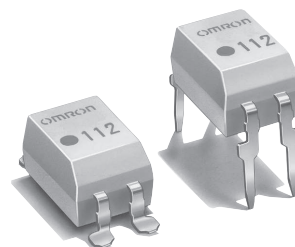
MOS FET Relays G3VM-401A/D

Analog-switching MOS FET Relays with 400-V Load Voltage

- A 4-pin Relay in the 400-V load voltage series.
- Continuous load current of 120 mA.
- Dielectric strength of 2,500 Vrms between I/O.
- RoHS Compliant.

Application Examples

- Measurement devices
- Security systems
- Amusement machines



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

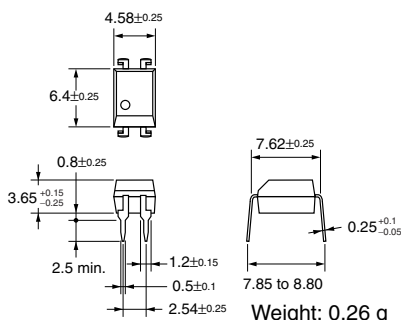
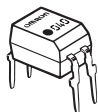
List of Models

| Contact form | Terminals | Load voltage (peak value) | Model | Number per stick | Number per tape |
|--------------|----------------------------|---------------------------|-----------|------------------|-----------------|
| SPST-NO | PCB terminals | 400 VAC | G3VM-401A | 100 | --- |
| | Surface-mounting terminals | | G3VM-401D | | |
| | | | | G3VM-401D(TR) | --- |

Dimensions

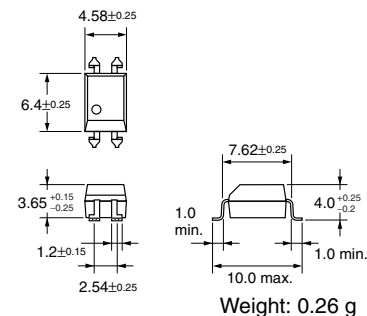
Note: All units are in millimeters unless otherwise indicated.

G3VM-401A



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

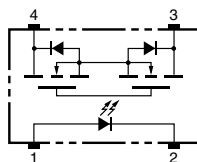
G3VM-401D



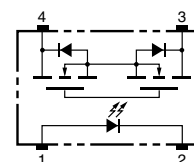
Note: The actual product is marked differently from the image shown here.

Terminal Arrangement/Internal Connections (Top View)

G3VM-401A

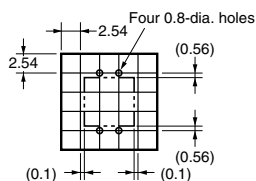


G3VM-401D



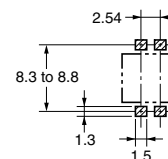
PCB Dimensions (Bottom View)

G3VM-401A



Actual Mounting Pad Dimensions (Recommended Value, Top View)

G3VM-401D



■ Absolute Maximum Ratings (Ta = 25°C)

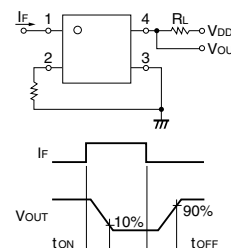
| Item | | Symbol | Rating | Unit | Measurement conditions |
|--|-------------------------------------|--------------------------------|-------------|-----------|-------------------------------|
| Input | LED forward current | I_F | 50 | mA | |
| | Repetitive peak LED forward current | I_{FP} | 1 | A | 100 μ s pulses, 100 pps |
| | LED forward current reduction rate | $\Delta I_F/^\circ\text{C}$ | -0.5 | mA/°C | Ta \geq 25°C |
| | LED reverse voltage | V_R | 5 | V | |
| | Connection temperature | T_j | 125 | °C | |
| Output | Load voltage (AC peak/DC) | V_{OFF} | 400 | V | |
| | Continuous load current | I_O | 120 | mA | |
| | ON current reduction rate | $\Delta I_{ON}/^\circ\text{C}$ | -1.2 | mA/°C | Ta \geq 25°C |
| | Connection temperature | T_j | 125 | °C | |
| Dielectric strength between input and output (See note 1.) | | V_{I-O} | 2,500 | V_{rms} | AC for 1 min |
| Operating temperature | | T_a | -40 to +85 | °C | With no icing or condensation |
| Storage temperature | | T_{slg} | -55 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 | $I_F = 10$ mA |
| | Reverse current | I_R | --- | --- | 10 | μ A | $V_R = 5$ V |
| | Capacity between terminals | C_T | --- | 30 | --- | pF | V = 0, f = 1 MHz |
| | Trigger LED forward current | I_{FT} | --- | 1 | 3 | mA | $I_O = 120$ mA |
| Output | Maximum resistance with output ON | R_{ON} | --- | 18 | 35 | Ω | $I_F = 5$ mA, $I_O = 120$ mA |
| | Current leakage when the relay is open | I_{LEAK} | --- | 0.0008 | 1.0 | μ A | $V_{OFF} = 400$ V |
| | Capacity between terminals | C_{OFF} | --- | 40 | --- | pF | V = 0, f = 1 MHz |
| Capacity between I/O terminals | | C_{I-O} | --- | 0.8 | --- | pF | f = 1 MHz, Vs = 0 V |
| Insulation resistance | | R_{I-O} | 1,000 | --- | --- | M Ω | $V_{I-O} = 500$ VDC, $R_{oh} \leq 60\%$ |
| Turn-ON time | | t_{ON} | --- | 0.4 | 1.0 | ms | $I_F = 5$ mA, $R_L = 200 \Omega$, $V_{DD} = 20$ V (See note 2.) |
| Turn-OFF time | | t_{OFF} | --- | 0.09 | 1.0 | ms | |

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



■ Recommended Operating Conditions

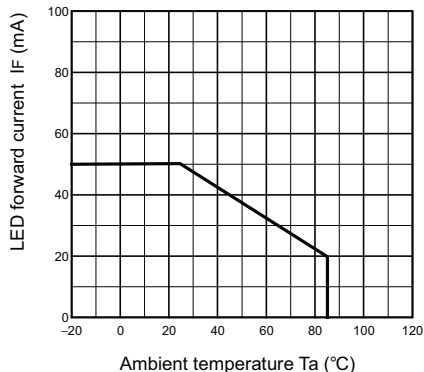
Use the G3VM under the following conditions so that the Relay will operate properly.

| Item | Symbol | Minimum | Typical | Maximum | Unit |
|--------------------------------------|----------|---------|---------|---------|------|
| Load voltage (AC peak/DC) | V_{DD} | --- | --- | 320 | V |
| Operating LED forward current | I_F | 5 | 7.5 | 25 | mA |
| Continuous load current (AC peak/DC) | I_O | --- | --- | 100 | mA |
| Operating temperature | T_a | -20 | --- | 65 | °C |

■ Engineering Data

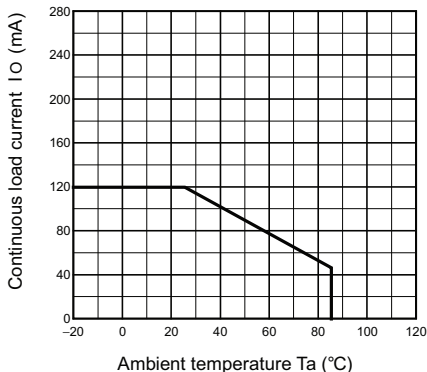
LED forward current vs. Ambient temperature

$I_F - T_a$



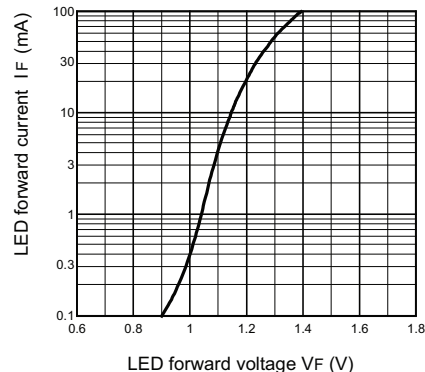
Continuous load current vs. Ambient temperature

$I_O - T_a$



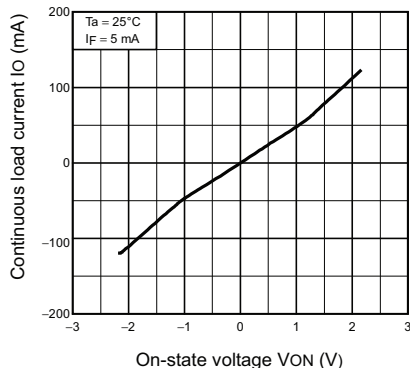
LED forward current vs. LED forward voltage

$I_F - V_F$



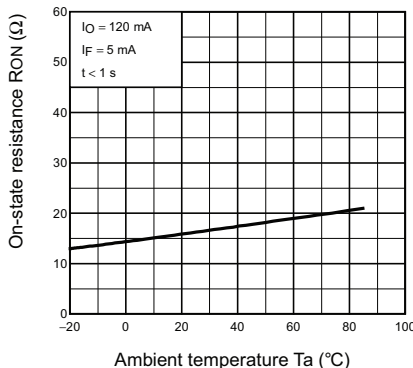
Continuous load current vs. On-state voltage

$I_O - V_{ON}$



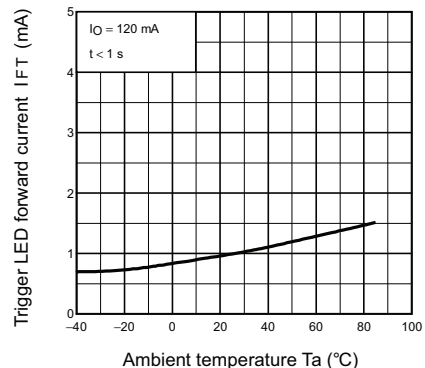
On-state resistance vs. Ambient temperature

$R_{ON} - T_a$



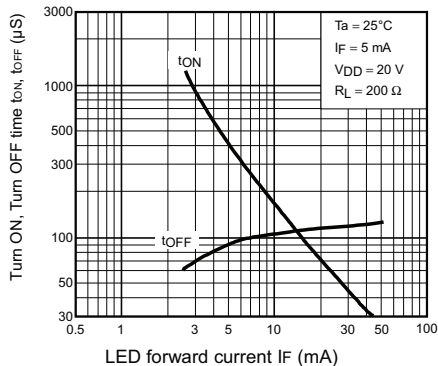
Trigger LED forward current vs. Ambient temperature

$I_{FT} - T_a$



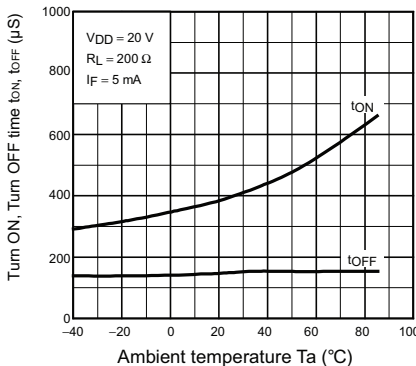
Turn ON, Turn OFF time vs. LED forward current

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



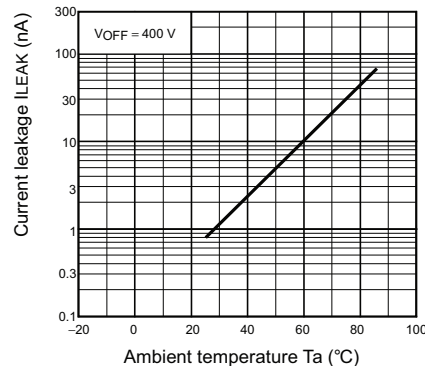
Turn ON, Turn OFF time vs. Ambient temperature

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



Current leakage vs. Ambient temperature

$I_{LEAK} - T_a$



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