## MOS FET Relays

New Series with 350-V Load Voltage

- Upgraded G3VM-3 Series.
- Continuous load current of 120 mA
- Dielectric strength of $2,500 \mathrm{Vrms}$ between I/O.
- Operating time of 0.3 ms (typical).


## Application Examples

- Measurement devices
- Security systems
- Amusement machines


NEW TI Approval pending
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 | 350 VAC | G3VM-351B | 50 | --- |
|  | Surface-mounting <br> terminals |  | G3VM-351E |  | 1,500 |
|  |  | G3VM-351E(TR) | --- |  |  |

## Dimensions

Note: All units are in millimeters unless otherwise indicated.

G3VM-351B


Note: The actual product is marked differently from the image ly from the im


G3VM-351E



## Terminal Arrangement/Internal Connections (Top View)

G3VM-351B


PCB Dimensions (Bottom View)
G3VM-351B


G3VM-351E


## - Actual Mounting Pad Dimensions

(Recommended Value, Top View)
G3VM-351E


- Absolute Maximum Ratings ( $\mathrm{Ta}=25^{\circ} \mathrm{C}$ )

| Item |  |  | Symbol | Rating | Unit | Measurement Conditions |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Input | LED forward current |  | $\mathrm{I}_{\mathrm{F}}$ | 50 | mA |  |
|  | Repetitive peak LED forward current |  | $\mathrm{I}_{\mathrm{FP}}$ | 1 | A | $100 \mu$ s pulses, 100 pps |
|  | LED forward current reduction rate |  | $\Delta \mathrm{IF}_{\mathrm{F}}{ }^{\circ} \mathrm{C}$ | -0.5 | $\mathrm{mA} /{ }^{\circ} \mathrm{C}$ | $\mathrm{Ta} \geq 25^{\circ} \mathrm{C}$ |
|  | LED reverse voltage |  | $\mathrm{V}_{\mathrm{R}}$ | 5 | V |  |
|  | Connection temperature |  | $\mathrm{T}_{\mathrm{j}}$ | 125 | ${ }^{\circ} \mathrm{C}$ |  |
| Output | Output dielectric strength |  | $\mathrm{V}_{\text {OFF }}$ | 350 | V |  |
|  | Continuous load current | Connection A | ${ }^{1}$ | 120 | mA |  |
|  |  | Connection B |  | 120 |  |  |
|  |  | Connection C |  | 240 |  |  |
|  | ON current reduction rate | Connection A | $\triangle \mathrm{ION}^{\prime}{ }^{\circ} \mathrm{C}$ | -1.2 | $\mathrm{mA} /{ }^{\circ} \mathrm{C}$ | $\mathrm{Ta} \geq 25^{\circ} \mathrm{C}$ |
|  |  | Connection B |  | -1.2 |  |  |
|  |  | Connection C |  | -2.4 |  |  |
|  | Connection temperature |  | $\mathrm{T}_{\mathrm{j}}$ | 125 | ${ }^{\circ} \mathrm{C}$ |  |
| Dielectric strength between input and output (See note 1.) |  |  | $\mathrm{V}_{1-\mathrm{O}}$ | 2,500 | Vrms | AC for 1 min |
| Operating temperature |  |  | $\mathrm{T}_{\mathrm{a}}$ | -40 to +85 | ${ }^{\circ} \mathrm{C}$ | With no icing or condensation |
| Storage temperature |  |  | $\mathrm{T}_{\text {stg }}$ | -55 to +125 | ${ }^{\circ} \mathrm{C}$ | With no icing or condensation |
| Soldering temperature (10 s) |  |  | --- | 260 | ${ }^{\circ} \mathrm{C}$ | 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.
Connection Diagram


Electrical Characteristics ( $\mathrm{Ta}=25^{\circ} \mathrm{C}$ )

| Item |  |  | Symbol | Minimum | Typical | Maximum | Unit | Measurement conditions |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Input | LED forward voltage |  | $\mathrm{V}_{\mathrm{F}}$ | 1.0 | 1.15 | 1.3 | V | $\mathrm{I}_{\mathrm{F}}=10 \mathrm{~mA}$ |
|  | Reverse current |  | $\mathrm{I}_{\mathrm{R}}$ | --- | --- | 10 | $\mu \mathrm{A}$ | $\mathrm{V}_{\mathrm{R}}=5 \mathrm{~V}$ |
|  | Capacity between terminals |  | $\mathrm{C}_{\text {T }}$ | --- | 30 | --- | pF | $\mathrm{V}=0, \mathrm{f}=1 \mathrm{MHz}$ |
|  | Trigger LED forward current |  | $\mathrm{I}_{\mathrm{FT}}$ | --- | 1 | 3 | mA | $\mathrm{I}_{0}=120 \mathrm{~mA}$ |
| Output | Maximum resistance with output ON | Connection A | $\mathrm{R}_{\text {ON }}$ | --- | 25 | 35 | $\Omega$ | $\begin{aligned} & \mathrm{I}_{\mathrm{F}}=5 \mathrm{~mA}, \\ & \mathrm{I}_{\mathrm{O}}=120 \mathrm{~mA}, \mathrm{t}<1 \mathrm{~s} \\ & \hline \end{aligned}$ |
|  |  |  |  | --- | 35 | 50 | $\Omega$ | $\begin{aligned} & \mathrm{I}_{\mathrm{F}}=5 \mathrm{~mA}, \\ & \mathrm{I}_{\mathrm{O}}=120 \mathrm{~mA} \\ & \hline \end{aligned}$ |
|  |  | Connection B |  | --- | 28 | 40 | $\Omega$ | $\begin{aligned} & \mathrm{I}_{\mathrm{F}}=5 \mathrm{~mA}, \\ & \mathrm{I}_{\mathrm{O}}=120 \mathrm{~mA} \end{aligned}$ |
|  |  | Connection C |  | --- | 14 | 20 | $\Omega$ | $\begin{aligned} & I_{F}=5 \mathrm{~mA}, \\ & \mathrm{I}_{\mathrm{O}}=240 \mathrm{~mA} \end{aligned}$ |
|  | Current leakage when the relay is open |  | $\mathrm{I}_{\text {LEAK }}$ | --- | --- | 1.0 | $\mu \mathrm{A}$ | $\mathrm{V}_{\text {OFF }}=350 \mathrm{~V}$ |
| Capacity between I/O terminals |  |  | $\mathrm{Cl}_{\mathrm{H}}$ | --- | 0.8 | --- | pF | $\mathrm{f}=1 \mathrm{MHz}$, Vs $=0 \mathrm{~V}$ |
| Insulation resistance |  |  | $\mathrm{R}_{1-\mathrm{O}}$ | 1,000 | --- | --- | $\mathrm{M} \Omega$ | $\begin{aligned} & \mathrm{V}_{1-\mathrm{O}}=500 \mathrm{VDC}, \\ & \mathrm{RoH} \leq 60 \% \end{aligned}$ |
| Turn-ON time |  |  | tON | --- | 0.3 | 1.0 | ms | $\mathrm{I}_{\mathrm{F}}=5 \mathrm{~mA}, \mathrm{R}_{\mathrm{L}}=200 \Omega$, |
| Turn-OFF time |  |  | tOFF | --- | 0.1 | 1.0 | ms | $\mathrm{V}_{\mathrm{DD}}=20 \mathrm{~V}$ (See note 2.) |

Note: 2. Turn-ON and Turn-OFF


## 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 | $\mathrm{V}_{\mathrm{DD}}$ | -- | --- | 280 | V |
| Operating LED forward current | $\mathrm{I}_{\mathrm{F}}$ | 5 | 10 | 25 | mA |
| Continuous load current | $\mathrm{I}_{\mathrm{O}}$ | -- | --- | 100 | mA |
| Operating temperature | $\mathrm{T}_{\mathrm{a}}$ | -20 | --- | 65 | ${ }^{\circ} \mathrm{C}$ |

## Engineering Data

Load Current vs. Ambient Temperature G3VM-351B(E)


