

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

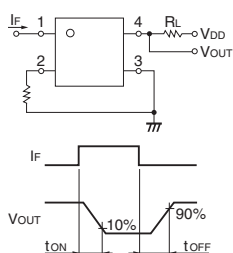
| Item                              |                                      | Symbol              | G3VM-21AR<br>G3VM-21DR | G3VM-31AR<br>G3VM-31DR | G3VM-41AR<br>G3VM-41DR | G3VM-61AR<br>G3VM-61DR | G3VM-61AR1<br>G3VM-61DR1 | G3VM-101AR<br>G3VM-101DR | G3VM-101AR1<br>G3VM-101DR1 | G3VM-201AR<br>G3VM-201DR | Unit             | Measurement<br>conditions     |
|-----------------------------------|--------------------------------------|---------------------|------------------------|------------------------|------------------------|------------------------|--------------------------|--------------------------|----------------------------|--------------------------|------------------|-------------------------------|
| Input                             | LED forward current                  | I <sub>F</sub>      | 30                     |                        |                        |                        |                          |                          |                            |                          | mA               |                               |
|                                   | Repetitive peak LED forward current  | I <sub>FP</sub>     | 1                      |                        |                        |                        |                          |                          |                            |                          | A                | 100 μs pulses,<br>100 pps     |
|                                   | LED forward current reduction rate   | ΔI <sub>F</sub> /°C | -0.3                   |                        |                        |                        |                          |                          |                            |                          | mA/°C            | T <sub>a</sub> ≥ 25°C         |
|                                   | LED reverse voltage                  | V <sub>R</sub>      | 5                      | 6                      | 5                      |                        | 6                        | 5                        | 6                          |                          | V                |                               |
|                                   | Connection temperature               | T <sub>J</sub>      | 125                    |                        |                        |                        |                          |                          |                            |                          | °C               |                               |
| Output                            | Load voltage (AC peak/DC)            | V <sub>OFF</sub>    | 20                     | 30                     | 40                     | 60                     | 60                       | 100                      |                            | 200                      | V                |                               |
|                                   | Continuous load current (AC peak/DC) | I <sub>o</sub>      | 3                      | 4                      | 2.5                    | 2                      | 3                        | 1                        | 2                          | 0.7                      | A                |                               |
|                                   | ON current reduction rate            | ΔI <sub>o</sub> /°C | -30                    | -40                    | -25                    | -20                    | -30                      | -10                      | -20                        | -7                       | mA/°C            | T <sub>a</sub> ≥ 25°C         |
|                                   | Pulse ON current                     | I <sub>op</sub>     | 9                      | 9                      | 7.5                    | 6                      | 9                        | 3                        | 6                          | 2.1                      | A                | t=100 ms,<br>Duty=1/10        |
|                                   | Connection temperature               | T <sub>J</sub>      | 125                    |                        |                        |                        |                          |                          |                            |                          | °C               |                               |
| Dielectric strength between I/O * |                                      | V <sub>I-O</sub>    | 2,500                  |                        |                        |                        |                          |                          |                            |                          | V <sub>rms</sub> | AC for 1 min                  |
| Ambient operating temperature     |                                      | T <sub>a</sub>      | -40 to +85             | -40 to +110            | -40 to +85             |                        | -40 to +110              | -40 to +85               | -40 to +110                |                          | °C               | With no icing or condensation |
| Ambient storage temperature       |                                      | T <sub>stg</sub>    | -55 to +125            |                        |                        |                        |                          |                          |                            |                          | °C               |                               |
| Soldering temperature             |                                      | —                   | 260                    |                        |                        |                        |                          |                          |                            |                          | °C               | 10 s                          |

\* 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-21AR<br>G3VM-21DR | G3VM-31AR<br>G3VM-31DR | G3VM-41AR<br>G3VM-41DR | G3VM-61AR<br>G3VM-61DR | G3VM-61AR1<br>G3VM-61DR1 | G3VM-101AR<br>G3VM-101DR | G3VM-101AR1<br>G3VM-101DR1 | G3VM-201AR<br>G3VM-201DR | Unit                                                                    | Measurement<br>conditions                                                                                                                                                                                                                                                                                                                                                                        |                              |
|---------------------------------------------------|----------------------------------------------|---------------------------------------|-----------------|------------------------|------------------------|------------------------|------------------------|--------------------------|--------------------------|----------------------------|--------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Input                                             | LED forward<br>voltage                       | V <sub>F</sub>                        | Minimum         | 1.18                   | 1.5                    | 1.18                   |                        | 1.5                      | 1.18                     | 1.5                        |                          | V                                                                       | I <sub>F</sub> =10 mA                                                                                                                                                                                                                                                                                                                                                                            |                              |
|                                                   |                                              |                                       | Typical         | 1.33                   | 1.64                   | 1.33                   |                        | 1.64                     | 1.33                     | 1.64                       |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|                                                   |                                              |                                       | Maximum         | 1.48                   | 1.8                    | 1.48                   |                        | 1.8                      | 1.48                     | 1.8                        |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|                                                   | Reverse current                              | I <sub>R</sub>                        | Maximum         | 10                     |                        |                        |                        |                          |                          |                            |                          |                                                                         | μA                                                                                                                                                                                                                                                                                                                                                                                               | V <sub>R</sub> =5 V          |
|                                                   | Capacitance<br>between<br>terminals          | C <sub>T</sub>                        | Typical         | 70                     |                        |                        |                        |                          |                          |                            |                          |                                                                         | pF                                                                                                                                                                                                                                                                                                                                                                                               | V=0, f=1 MHz                 |
|                                                   | Trigger LED<br>forward current               | I <sub>FT</sub><br>(I <sub>FC</sub> ) | Typical         | 0.7                    | 0.3                    | 0.5                    |                        | 0.3                      | 0.5                      | 0.4                        | 0.3                      | mA                                                                      | G3VM-201AR/201DR:<br>I <sub>o</sub> =0.7A<br>Others: I <sub>o</sub> =1A                                                                                                                                                                                                                                                                                                                          |                              |
|                                                   |                                              |                                       | Maximum         | 3                      |                        |                        |                        |                          |                          |                            |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|                                                   | Release LED<br>forward current               | I <sub>FC</sub><br>(I <sub>FT</sub> ) | Minimum         | 0.1                    |                        |                        |                        |                          |                          |                            |                          |                                                                         | mA                                                                                                                                                                                                                                                                                                                                                                                               | I <sub>OFF</sub> =10 μA      |
| Typical                                           | 0.1                                          | 0.2                                   | 0.1             |                        | 0.2                    | 0.1                    | 0.2                    |                          |                          |                            |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
| Output                                            | Maximum<br>resistance with<br>output ON      | R <sub>ON</sub>                       | Typical         | 40                     | 25                     | 50                     | 80                     | 45                       | 250                      | 110                        | 900                      | mΩ                                                                      | G3VM-31AR/31DR<br>I <sub>F</sub> =5mA, t<1s, I <sub>o</sub> =4A<br>G3VM-61AR1/61DR1<br>I <sub>F</sub> =5mA, t<1s, I <sub>o</sub> =3A<br>G3VM-21AR/21DR/<br>41AR/41DR/61AR/<br>61DR/101AR1/101DR1:<br>I <sub>F</sub> =5mA, t<1s, I <sub>o</sub> =2A<br>G3VM-101AR/101DR:<br>I <sub>F</sub> =5mA, t<1s, I <sub>o</sub> =1A<br>G3VM-201AR/201DR:<br>I <sub>F</sub> =5mA, t<1s, I <sub>o</sub> =0.7A |                              |
|                                                   |                                              |                                       | Maximum         | 80                     | 50                     | 150                    | 200                    | 100                      | 700                      | 200                        | 2000                     |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|                                                   | Current leakage<br>when the relay<br>is open | I <sub>LEAK</sub>                     | Typical         | —                      | 0.01                   | —                      |                        | 0.005                    | —                        | 0.01                       | 0.04                     | μA                                                                      | V <sub>OFF</sub> =Load voltage<br>ratings                                                                                                                                                                                                                                                                                                                                                        |                              |
|                                                   |                                              |                                       | Maximum         | 1                      |                        |                        |                        |                          |                          |                            |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|                                                   | Capacitance<br>between<br>terminals          | C <sub>OFF</sub>                      | Typical         | 300                    | 450                    | 300                    | 250                    |                          | 200                      | 110                        |                          | pF                                                                      | V=0, f=1 MHz                                                                                                                                                                                                                                                                                                                                                                                     |                              |
|                                                   | Capacitance<br>between I/O<br>terminals      | C <sub>I-O</sub>                      | Typical         | 0.8                    |                        |                        |                        |                          |                          |                            |                          |                                                                         | pF                                                                                                                                                                                                                                                                                                                                                                                               | f=1 MHz, V <sub>S</sub> =0 V |
| Insulation<br>resistance between<br>I/O terminals | R <sub>I-O</sub>                             | Minimum                               | 1000            |                        |                        |                        |                        |                          |                          |                            |                          | MΩ                                                                      | V <sub>I-O</sub> =500 VDC,<br>RoH≤60%                                                                                                                                                                                                                                                                                                                                                            |                              |
|                                                   |                                              | Typical                               | 10 <sup>8</sup> |                        |                        |                        |                        |                          |                          |                            |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
| Turn-ON time                                      | t <sub>ON</sub>                              | Typical                               | 1               | 0.6                    | 0.8                    |                        | 0.45                   | 0.8                      | 0.4                      | 0.13                       | ms                       | I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω,<br>V <sub>DD</sub> =20 V * |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|                                                   |                                              | Maximum                               | 5               | 3                      | 5                      |                        | 2                      | 5                        | 2                        | 1                          |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
| Turn-OFF time                                     | t <sub>OFF</sub>                             | Typical                               | 0.3             |                        |                        |                        | 0.2                    | 0.3                      | 0.2                      | 0.14                       |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|                                                   |                                              | Maximum                               | 1               |                        |                        |                        |                        |                          | 0.5                      |                            |                          |                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                  |                              |

\* Turn-ON and Turn-OFF Times



Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.  
Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

| Item                                    | Symbol          |         | G3VM-21AR<br>G3VM-21DR | G3VM-31AR<br>G3VM-31DR | G3VM-41AR<br>G3VM-41DR | G3VM-61AR<br>G3VM-61DR | G3VM-61AR1<br>G3VM-61DR1 | G3VM-101AR<br>G3VM-101DR | G3VM-101AR1<br>G3VM-101DR1 | G3VM-201AR<br>G3VM-201DR | Unit |
|-----------------------------------------|-----------------|---------|------------------------|------------------------|------------------------|------------------------|--------------------------|--------------------------|----------------------------|--------------------------|------|
| Load voltage<br>(AC peak/DC)            | V <sub>DD</sub> | Maximum | 16                     | 24                     | 32                     | 48                     |                          | 80                       |                            | 160                      | V    |
| Operating LED forward<br>current        | I <sub>F</sub>  | Minimum | 5                      |                        |                        |                        |                          |                          |                            |                          | mA   |
|                                         |                 | Typical | 10                     |                        |                        |                        |                          |                          |                            |                          |      |
|                                         |                 | Maximum | 25                     |                        |                        |                        |                          |                          |                            |                          |      |
| Continuous load current<br>(AC peak/DC) | I <sub>O</sub>  | Maximum | 3                      | 4                      | 2.5                    | 2                      | 3                        | 1                        | 2                          | 0.7                      | A    |
| Ambient operating<br>temperature        | T <sub>a</sub>  | Minimum | -20                    |                        |                        |                        |                          |                          |                            |                          | °C   |
|                                         |                 | Maximum | 65                     | 85                     | 65                     |                        | 85                       | 65                       | 85                         |                          |      |

Spacing and Insulation

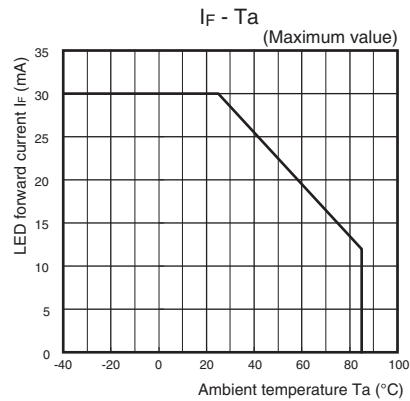
| Item                         | Minimum | Unit |
|------------------------------|---------|------|
| Creepage distances           | 7.0     | mm   |
| Clearance distances          | 7.0     |      |
| Internal isolation thickness | 0.4     |      |

DIP  
G3VM-AR/DR

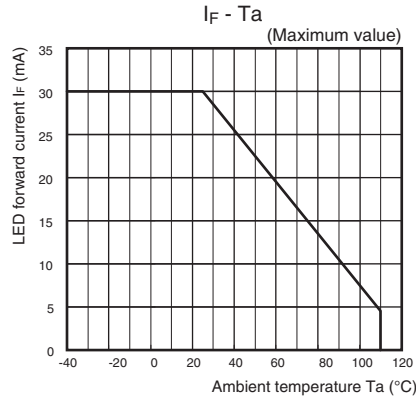
## Engineering Data

### LED forward current vs. Ambient temperature

G3VM-21AR/21DR/41AR/41DR/61AR/61DR/101AR/101DR

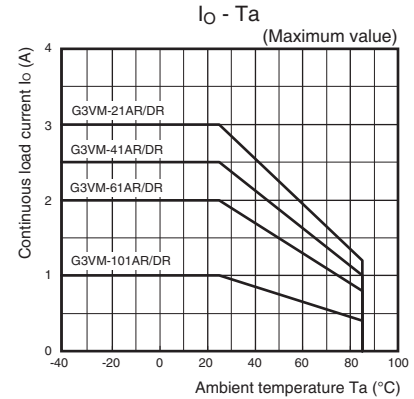


G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1/201AR/201DR



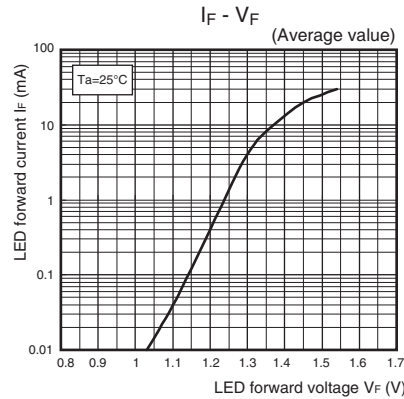
### Continuous load current vs. Ambient temperature

G3VM-21AR/21DR/41AR/41DR/61AR/61DR/101AR/101DR

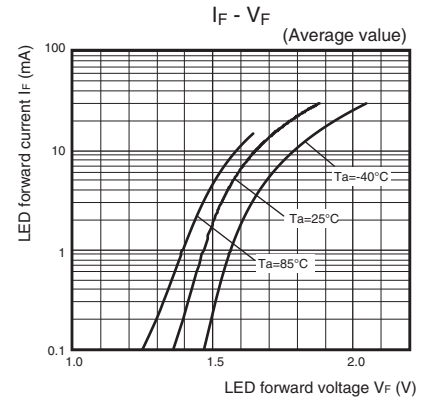


### LED forward current vs. LED forward voltage

G3VM-21AR/21DR/41AR/41DR/61AR/61DR/101AR/101DR

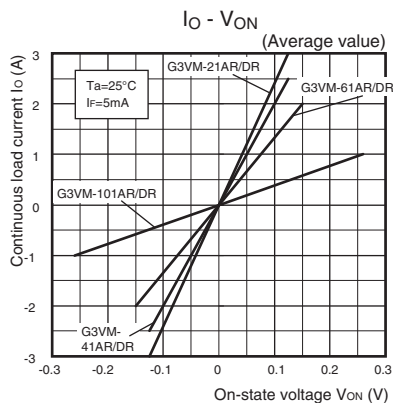


G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1/201AR/201DR

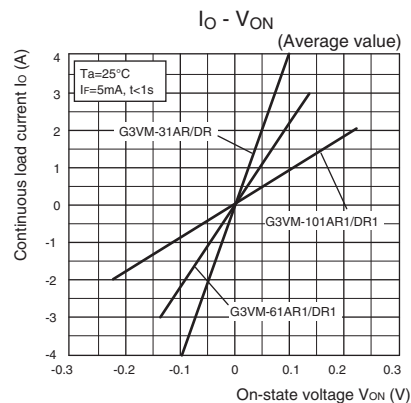


### Continuous load current vs. On-state voltage

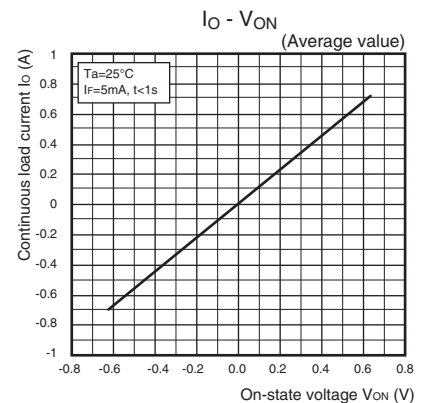
G3VM-21AR/21DR/41AR/41DR/61AR/61DR/101AR/101DR



G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1



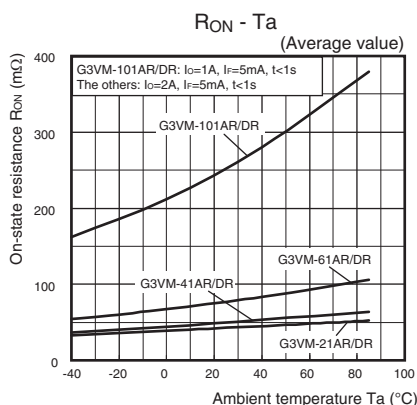
G3VM-201AR/201DR



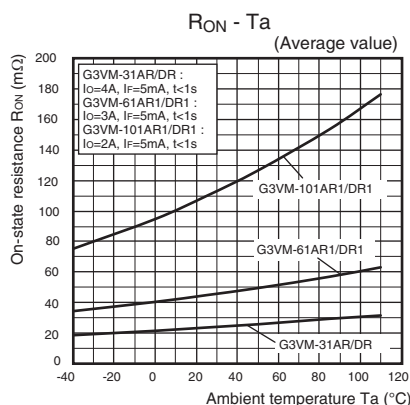
## Engineering Data

### On-state resistance vs. Ambient temperature

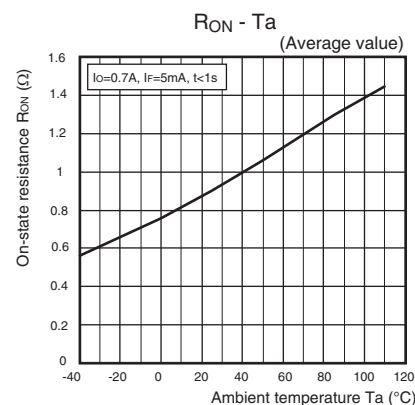
G3VM-21AR/21DR/41AR/41DR/61AR/61DR/101AR/101DR



G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1/201AR/201DR

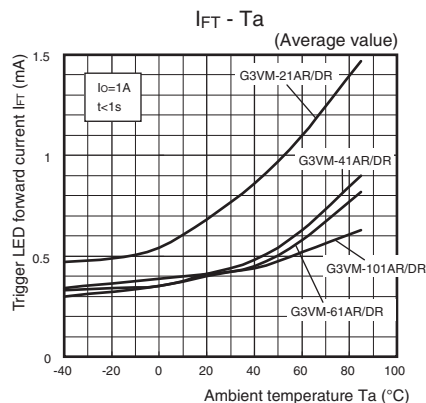


G3VM-201AR/201DR

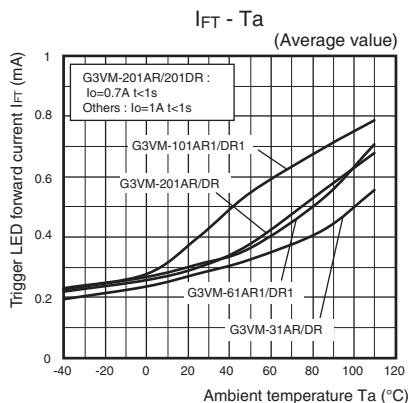


### Trigger LED forward current vs. Ambient temperature

G3VM-21AR/21DR/41AR/41DR/61AR/61DR/101AR/101DR

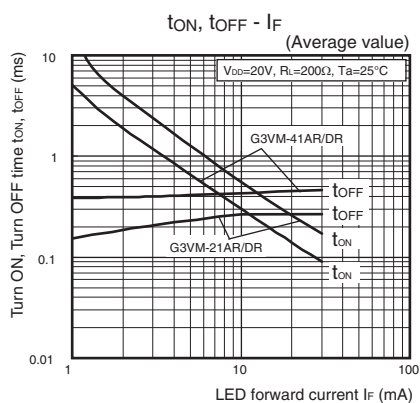


G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1/201AR/201DR

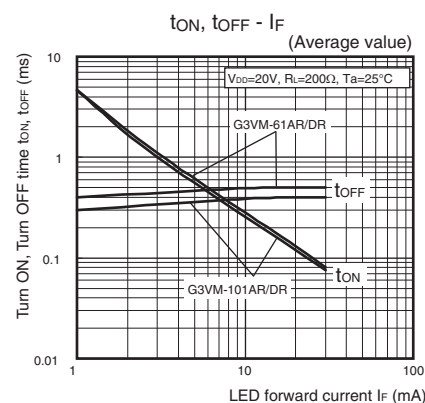


### Turn ON, Turn OFF time vs. LED forward current

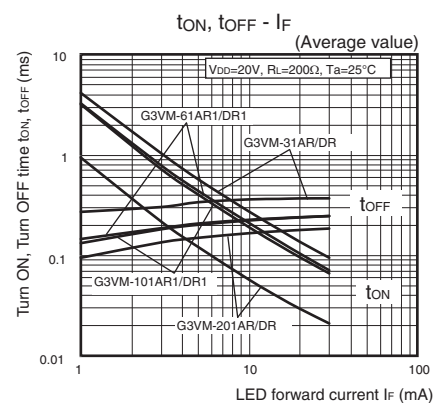
G3VM-21AR/21DR/41AR/41DR



G3VM-61AR/61DR/101AR/101DR



G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1/201AR/201DR



DIP

G3VM-□AR□/□DR□

Engineering Data

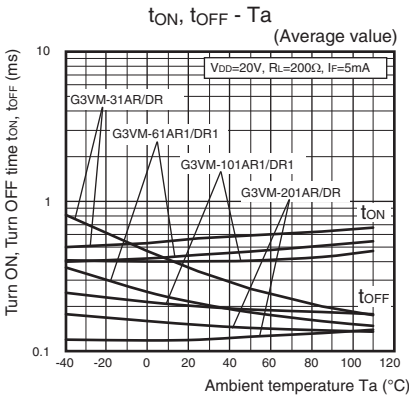
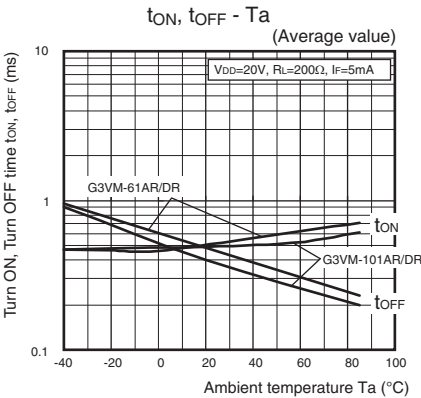
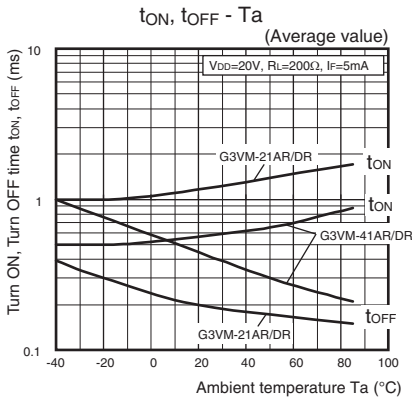
Turn ON, Turn OFF time vs. Ambient temperature  
G3VM-21AR/21DR/41AR/41DR

G3VM-61AR/61DR/101AR/101DR

G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1/201AR/201DR

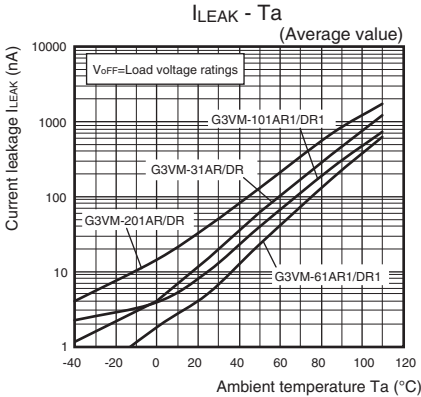
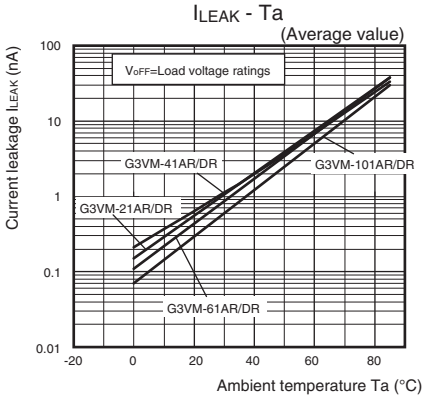
DIP

G3VM-AR/DR



Current leakage vs. Ambient temperature  
G3VM-21AR/21DR/41AR/41DR/61AR/61DR/101AR/101DR

G3VM-31AR/31DR/61AR1/61DR1/101AR1/101DR1/201AR/201DR

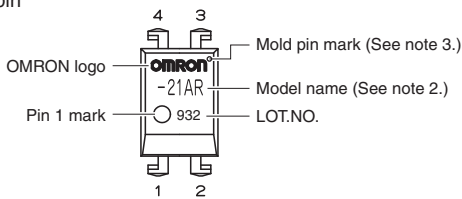


Appearance / Terminal Arrangement / Internal Connections

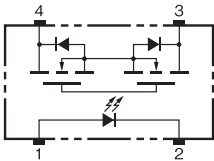
Appearance

DIP (Dual Inline Package)

DIP 4-pin



Terminal Arrangement/Internal Connections (Top View)

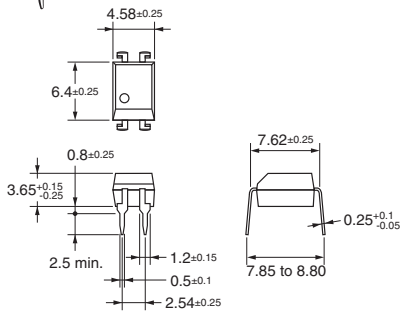


- Note:** 1. The actual product is marked differently from the image shown here.  
**Note:** 2. "G3VM" does not appear in the model number on the Relay.  
**Note:** 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

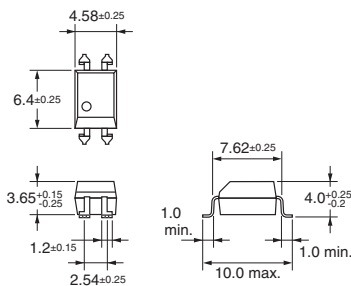
Dimensions (Unit: mm)



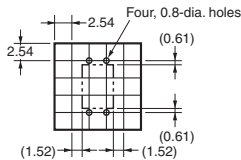
PCB Terminals  
Weight: 0.25 g



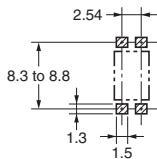
Surface-mounting Terminals  
Weight: 0.25 g



PCB Dimensions (BOTTOM VIEW)



Actual Mounting Pad Dimensions  
(Recommended Value, Top View)



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

Approved Standards

UL recognized

| Approved Standards | Contact form | File No. |
|--------------------|--------------|----------|
| UL (recognized)    | 1a (SPST-NO) | E80555   |

Safety Precautions

- Refer to the *Common Precautions for All MOS FET Relays* for precautions that apply to all MOS FET Relays.

DIP

G3VM-□AR□/□DR□

Please check each region's Terms & Conditions by region website.

OMRON Corporation  
Electronic and Mechanical Components Company

| Regional Contact                                                                              |                                                                                    |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Americas<br><a href="https://www.components.omron.com/">https://www.components.omron.com/</a> | Europe<br><a href="http://components.omron.eu/">http://components.omron.eu/</a>    |
| Asia-Pacific<br><a href="https://ecb.omron.com.sg/">https://ecb.omron.com.sg/</a>             | China<br><a href="https://www.ecb.omron.com.cn/">https://www.ecb.omron.com.cn/</a> |
| Korea<br><a href="https://www.omron-ecb.co.kr/">https://www.omron-ecb.co.kr/</a>              | Japan<br><a href="https://www.omron.co.jp/ecb/">https://www.omron.co.jp/ecb/</a>   |