

# MOS FET Relays

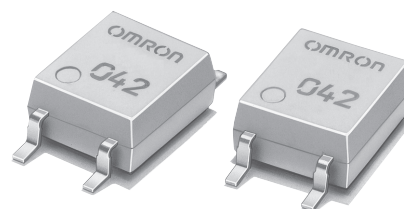
## G3VM-21GR

**MOS FET Relay with Low Output Capacitance and ON Resistance ( $C \times R = 5\text{pF} \cdot \Omega$ ) in a 20-V Load Voltage, SOP Package.**

- Output capacitance of 1 pF (typical) allows high-frequency applications.
- Leakage current of 1.0 nA max. (0.2 nA typ.) when relay is open.
- RoHS Compliant.

### ■ Application Examples

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



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

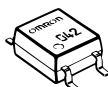
### ■ List of Models

Contact form	Terminals	Load voltage (peak value)	Model	Number per stick	Number per tape
SPST-NO	Surface-mounting terminals	20 VAC	G3VM-21GR	100	
			G3VM-21GR(TR)	---	2,500

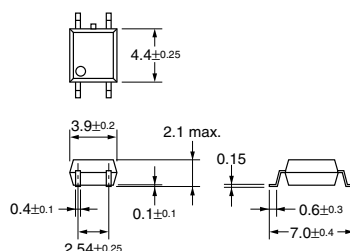
### ■ Dimensions

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

#### G3VM-21GR



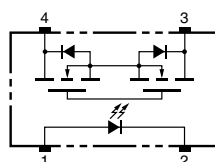
**Note:** The actual product is marked differently from the image shown here.



Weight: 0.1 g

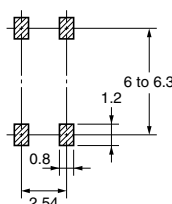
### ■ Terminal Arrangement/Internal Connections (Top View)

#### G3VM-21GR



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

#### G3VM-21GR



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

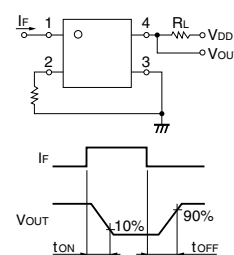
Item		Symbol	Rating	Unit	Measurement conditions
Input	LED forward current	I <sub>F</sub>	50	mA	
	Repetitive peak LED forward current	I <sub>FP</sub>	1	A	100 μs pulses, 100 pps
	LED forward current reduction rate	Δ I <sub>F</sub> /°C	−0.5	mA/°C	T <sub>a</sub> ≥ 25°C
	LED reverse voltage	V <sub>R</sub>	5	V	
	Connection temperature	T <sub>J</sub>	125	°C	
Output	Load voltage (AC peak/DC)	V <sub>OFF</sub>	20	V	
	Continuous load current	I <sub>O</sub>	160	mA	
	ON current reduction rate	Δ I <sub>ON</sub> /°C	−1.6	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	Vrms	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	μA
	Capacity between terminals	$C_T$	---	15	---	pF
	Trigger LED forward current	$I_{FT}$	---	---	4	mA
Output	Maximum resistance with output ON	$R_{ON}$	---	5	8	Ω
	Current leakage when the relay is open	$I_{LEAK}$	---	0.2	1.0	nA
	Capacity between terminals	$C_{OFF}$	---	1.0	2.5	pF
Capacity between I/O terminals		$C_{I-O}$	---	0.8	---	pF
Insulation resistance		$R_{I-O}$	1,000	---	---	MΩ
Turn-ON time		$t_{ON}$	---	0.025	0.5	ms
Turn-OFF time		$t_{OFF}$	---	0.11	0.5	ms

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



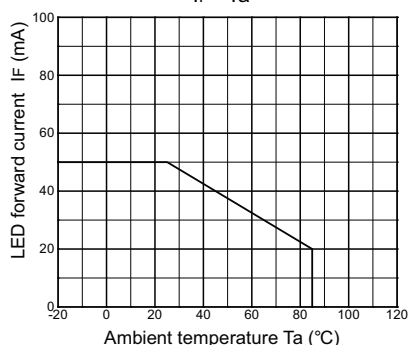
## ■ Recommended Operating Conditions

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

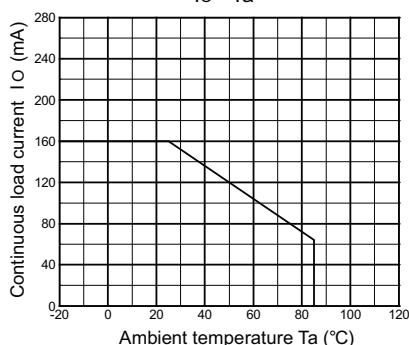
Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	$V_{DD}$	---	---	20	V
Operating LED forward current	$I_F$	7	---	30	mA
Continuous load current (AC peak/DC)	$I_O$	---	---	160	mA
Operating temperature	$T_a$	25	---	60	°C

# ■ Engineering Data

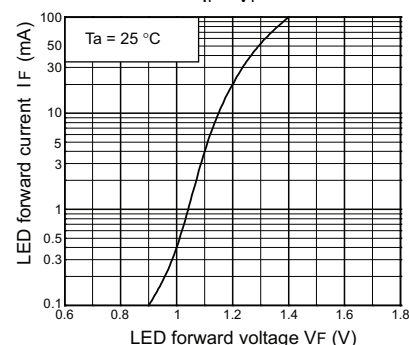
**LED forward current vs.  
Ambient temperature**  
 $I_F - T_a$



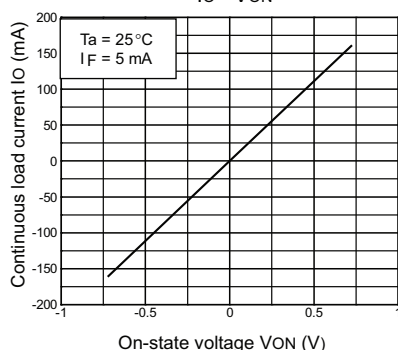
**Continuous load current vs.  
Ambient temperature**  
 $I_O - T_a$



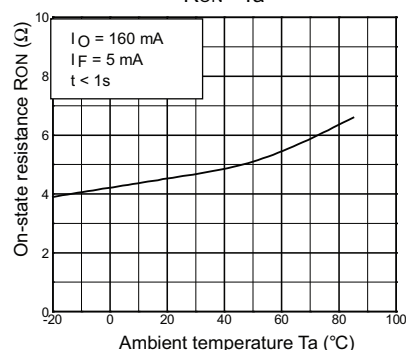
**LED forward current vs.  
LED forward voltage**  
 $I_F - V_F$



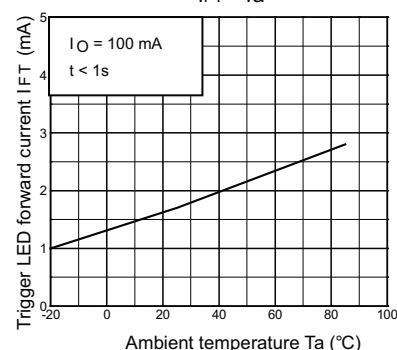
**Continuous load current vs.  
On-state voltage**  
 $I_O - V_{ON}$



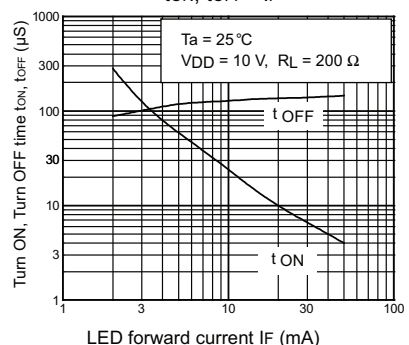
**On-state resistance vs.  
Ambient temperature**  
 $R_{ON} - T_a$



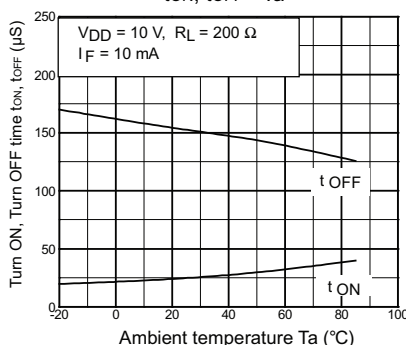
**Trigger LED forward current vs.  
Ambient temperature**  
 $I_{FT} - T_a$



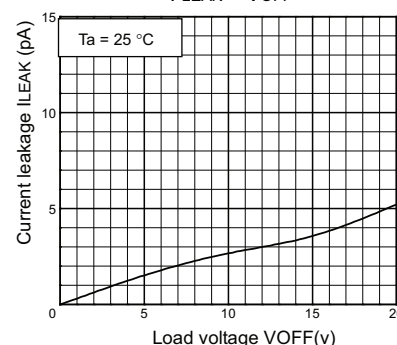
**Turn ON, Turn OFF time vs.  
LED forward current**  
 $t_{ON}, t_{OFF} - I_F$



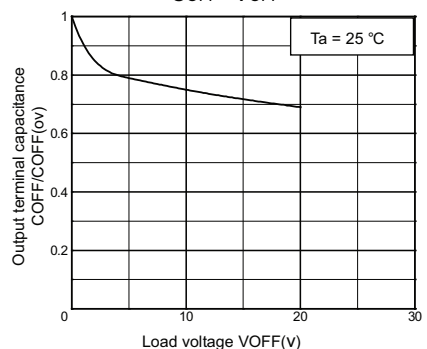
**Turn ON, Turn OFF time vs.  
Ambient temperature**  
 $t_{ON}, t_{OFF} - T_a$



**Current leakage vs.  
Load voltage**  
 $I_{LEAK} - V_{OFF}$



**Output terminal capacitance  
COFF/COFF(ov) vs. Load voltage**  
 $COFF - V_{OFF}$



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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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