

# MOS FET Relays

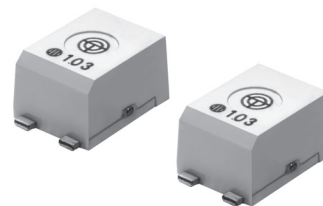
## G3VM-21PR10

**Smallest Class in market, USOP Package**  
**MOS FET Relay with Low Output Capacitance and**  
**ON Resistance ( $C \times R = 2.5 \text{ pF} \cdot \Omega$ ) in a 20-V Load**  
**Voltage Model.**

- Dielectric strength of 500 Vrms between I/O
- $C_{\text{OFF}} = 0.8 \text{ pF}$  (typical) and  $R_{\text{ON}} = 3 \Omega$  (typical).
- RoHS compliant.

### ■ Application Examples

- Semiconductor inspection tools
- Measurement devices and Data loggers
- Communication equipment



**NEW**

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

### ■ List of Models

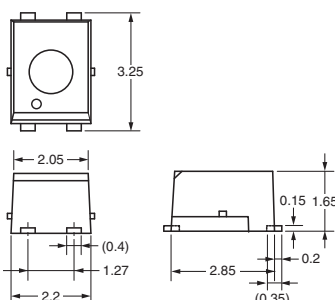
Package Type	Contact form	Terminals	Load voltage (peak value)	Model	Number per tape
USOP4	SPST-NO	Surface-mounting terminals	20 VAC or VDC	G3VM-21PR10	---
				G3VM-21PR10(TR05)	500
				G3VM-21PR10(TR)	1,500

**Note:** Tape-cut USOP's are packaged without humidity resistance. Use manual soldering to mount them. Refer to the common precautions contained in the Technical Users Guide, "MOS FET Relays, Technical Information".

### ■ Dimensions

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

#### G3VM-21PR10

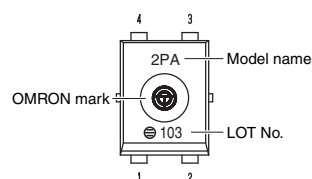
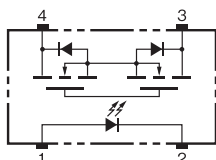


**Note:** The actual product is marked differently from the image shown here.

Weight: 0.03 g

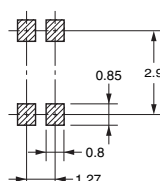
### ■ Terminal Arrangement/Internal Connections (Top View)

#### G3VM-21PR10



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

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

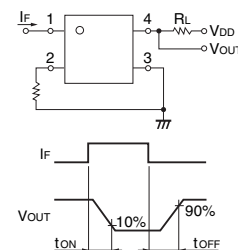
Item	Symbol	Rating	Unit	Measurement Conditions
Input	LED forward current	$I_F$	50	mA
	LED forward current reduction rate	$\Delta I_F/^{\circ}\text{C}$	-0.5	mA/ $^{\circ}\text{C}$
	LED reverse voltage	$V_R$	5	V
	Connection temperature	$T_J$	125	$^{\circ}\text{C}$
Output	Load voltage (AC peak/DC)	$V_{OFF}$	20	V
	Continuous load current (AC peak/DC)	$I_O$	200	mA
	ON current reduction rate	$\Delta I_{ON}/^{\circ}\text{C}$	-2.0	mA/ $^{\circ}\text{C}$
	Pulse ON current	$I_{OP}$	600	mA
	Connection temperature	$T_J$	125	$^{\circ}\text{C}$
Dielectric strength between input and output (See note 1.)		$V_{I-O}$	500	$V_{rms}$
Ambient operating temperature		$T_a$	-40 to +85	$^{\circ}\text{C}$
Ambient Storage temperature		$T_{stg}$	-40 to +125	$^{\circ}\text{C}$
Soldering temperature		---	260	$^{\circ}\text{C}$

**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	$\mu\text{A}$
	Capacity between terminals	$C_T$	---	15	---	pF
	Trigger LED forward current	$I_{FT}$	---	1.0	3	mA
Output	Maximum resistance with output ON	$R_{ON}$	---	3.0	5	$\Omega$
	Current leakage when the relay is open	$I_{LEAK}$	---	---	1	nA
	Capacity between terminals	$C_{OFF}$	---	0.8	1.1	pF
Capacity between I/O terminals		$C_{I-O}$	---	0.4	---	pF
Insulation resistance between I/O terminals		$R_{I-O}$	1,000	---	---	M $\Omega$
Turn-ON time		$t_{ON}$	---	0.04	0.2	ms
Turn-OFF time		$t_{OFF}$	---	0.13	0.2	ms

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



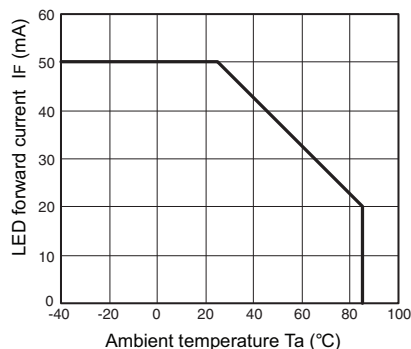
## ■ Recommended Operating Conditions

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

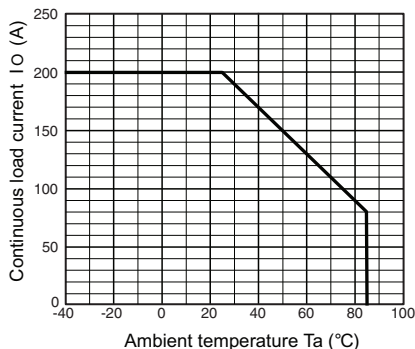
Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	$V_{DD}$	---	---	16	V
Operating LED forward current	$I_F$	5	7.5	20	mA
Continuous load current (AC peak/DC)	$I_O$	---	---	200	mA
Ambient Operating temperature	$T_a$	-20	---	65	$^{\circ}\text{C}$

# ■ Engineering Data

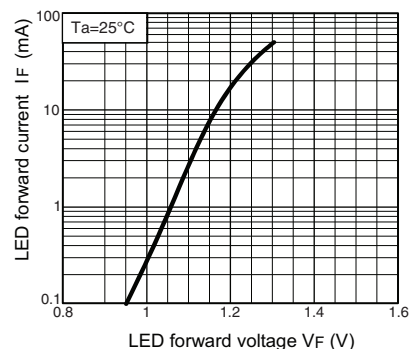
**LED forward current vs.  
Ambient temperature**  
 $I_F - T_a$



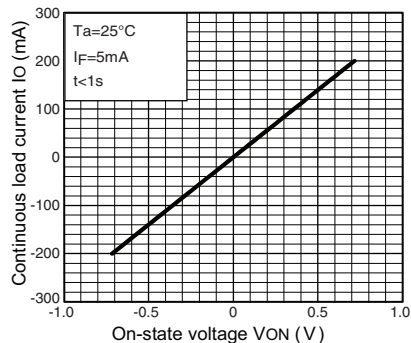
**Continuous load current vs.  
Ambient temperature**  
 $I_O - T_a$



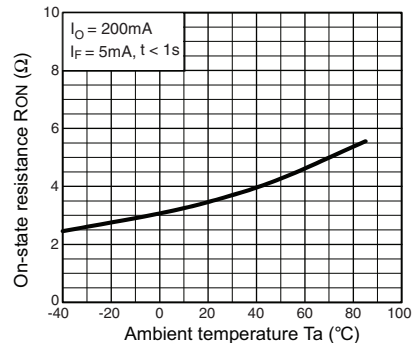
**LED forward current vs.  
LED forward voltage**  
 $I_F - V_F$



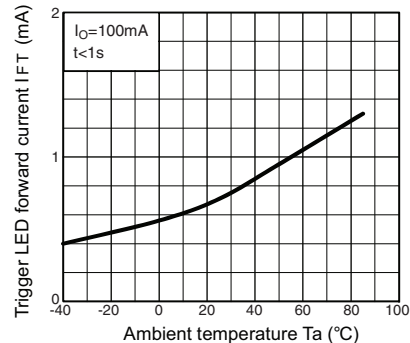
**Continuous load current vs.  
On-state voltage**  
 $I_O - V_{ON}$



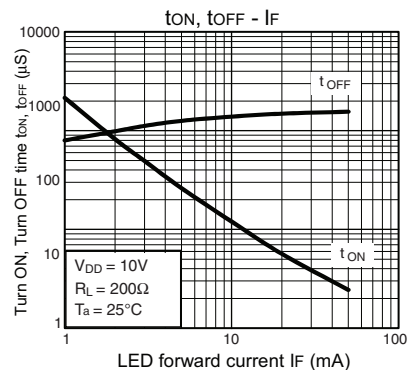
**On-state resistance vs.  
Ambient temperature**  
 $R_{ON} - T_a$



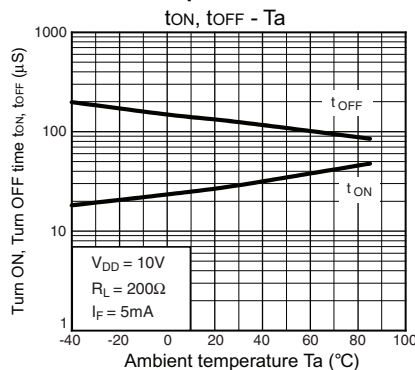
**Trigger LED forward current vs.  
Ambient temperature**  
 $I_{FT} - T_a$



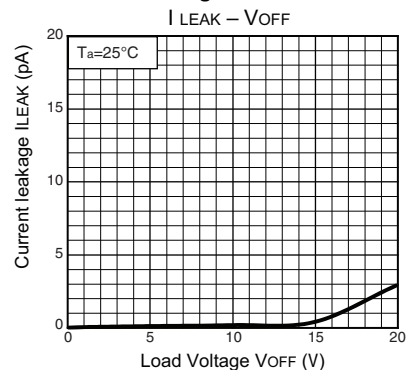
**Turn ON, Turn OFF time vs.  
LED forward current**  
 $t_{ON}, t_{OFF} - I_F$



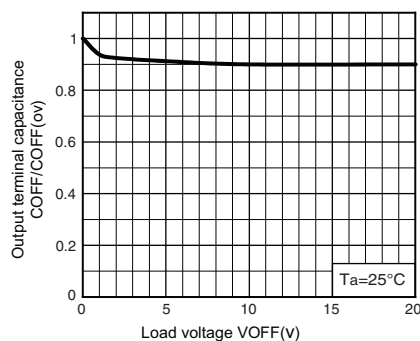
**Turn ON, Turn OFF time vs.  
Ambient temperature**  
 $t_{ON}, t_{OFF} - T_a$



**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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