


# G3VM-51PR

MOS FET Relays

**Smallest Class in market, USOP Package MOS FET Relays is designed to exhibit a fast rise time and reduce signal degradation.**

- ERT(Equivalent Rise Time): 40 ps (typ.), 90 ps (max)
- Dielectric strength of 500Vrms between I/O.

RoHS Compliant

 Refer to "Common Precautions".

## Application Examples

- Semiconductor test equipment
- Communication equipment
- Test & measurement equipment
- Data loggers

## List of Models

Package type	Contact form	Terminals	Load voltage (peak value) (See note.)	Model	Minimum package quantity
					Number per tape & reel
USOP4	1a (SPST-NO)	Surface-mounting terminals	50V	G3VM-51PR	—
				G3VM-51PR (TR05)	500
				G3VM-51PR (TR)	1,500

Note 1. Ask you OMRON representative for orders under 1,500 pcs or 500 pcs.

2. Tape-cut USOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

3. The AC peak and DC value is given for the load voltages.

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

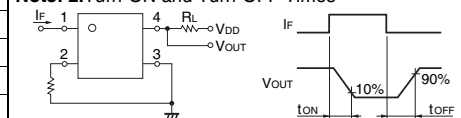
Item	Symbol	Rating	Unit	Measurement conditions	
Input	LED forward current	If	50	mA	
	LED forward current reduction rate	$\Delta I_f/^\circ\text{C}$	-0.5	mA/°C	Ta≥25°C
	LED reverse voltage	V <sub>R</sub>	5	V	
	Connection temperature	T <sub>J</sub>	125	°C	
Output	Load voltage (AC peak/DC)	V <sub>OFF</sub>	50	V	
	Continuous load current (AC peak/DC)	I <sub>o</sub>	300	mA	
	ON current reduction rate	$\Delta I_o/^\circ\text{C}$	-3.0	mA/°C	Ta≥25°C
	Pulse ON current	I <sub>op</sub>	900	mA	t=100ms, Duty=1/10
Connection temperature	T <sub>J</sub>	125	°C		
Dielectric strength between I/O (See note 1.)	V <sub>I-O</sub>	500	V <sub>rms</sub>	AC for 1 min	
Ambient operating temperature	T <sub>a</sub>	-40 ~ +85	°C	With no icing or condensation	
Ambient storage temperature	T <sub>stg</sub>	-40 ~ +125	°C	With no icing or condensation	
Soldering temperature	—	260	°C	10s	

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.

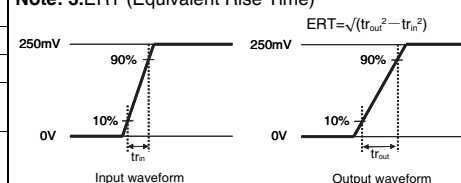
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	Minimum	Typical	Maximum	Unit	Measurement conditions	
Input	LED forward voltage	V <sub>F</sub>	1.0	1.15	1.3	V	I <sub>f</sub> =10mA
	Reverse current	I <sub>R</sub>	—	—	10	μA	V <sub>R</sub> =5V
	Capacity between terminals	C <sub>T</sub>	—	15	—	pF	V=0, f=1MHz
Output	Trigger LED forward current	I <sub>FT</sub>	—	0.5	3	mA	I <sub>o</sub> =100mA
	Maximum resistance with output ON	R <sub>ON</sub>	—	1	1.5	Ω	I <sub>f</sub> =5mA, I <sub>o</sub> =300mA, t<1s
	Current leakage when the relay is open	I <sub>LEAK</sub>	—	—	1	nA	V <sub>OFF</sub> =50V
	Capacity between terminals	C <sub>OFF</sub>	—	12	—	pF	V=0, f=100MHz, t<1s
	Capacity between I/O terminals	C <sub>I-O</sub>	—	0.4	—	pF	f=1MHz, V <sub>s</sub> =0V
	Insulation resistance between I/O terminals	R <sub>I-O</sub>	1000	—	—	MΩ	V <sub>I-O</sub> =500VDC, RoH≤60%
	Turn-ON time	t <sub>ON</sub>	—	0.2	0.5	ms	I <sub>f</sub> =5mA, R <sub>L</sub> =200Ω, V <sub>DD</sub> =20V (See note 2.)
Turn-OFF time	t <sub>OFF</sub>	—	0.1	0.4	ms		
Equivalent rise time	ERT	—	40	90	ps	I <sub>f</sub> =5mA, V <sub>DD</sub> =0.25V, Tr(in)=25ps (See Note.3)	

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



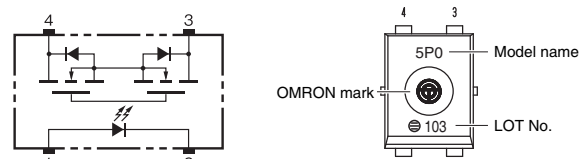
Note: 3. ERT (Equivalent Rise Time)



**NEW**

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

## Terminal Arrangement/Internal Connections



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

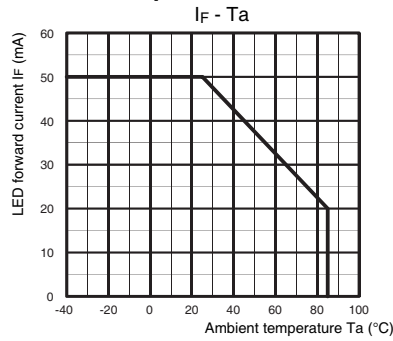
## Recommended Operating Conditions

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

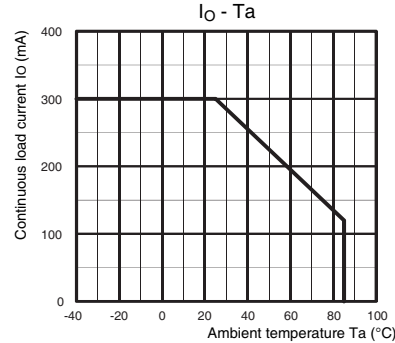
Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	V <sub>DD</sub>	-	-	40	V
Operating LED forward current	I <sub>F</sub>	5	7.5	20	mA
Continuous load current (AC peak/DC)	I <sub>O</sub>	-	-	300	mA
Ambient operating temperature	T <sub>a</sub>	-20	-	65	°C

## Engineering Data

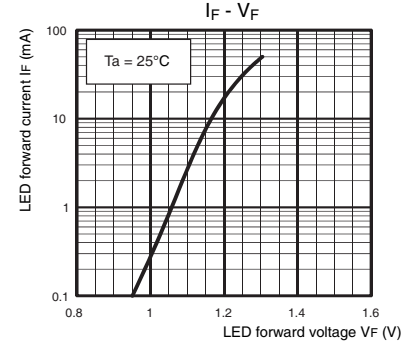
**LED forward current vs. Ambient temperature**



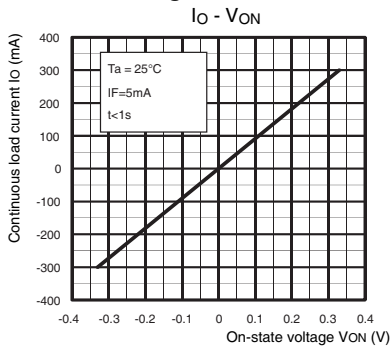
**Continuous load current vs. Ambient temperature**



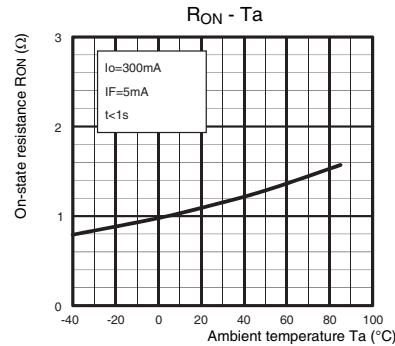
**LED forward current vs. LED forward voltage**



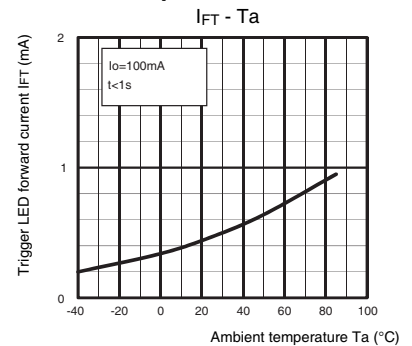
**Continuous load current vs. On-state voltage**



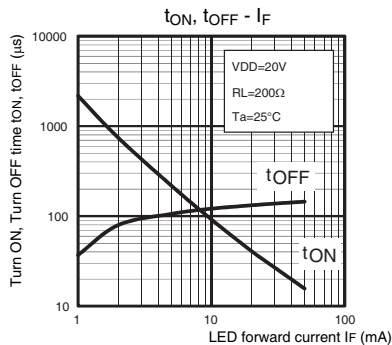
**On-state resistance vs. Ambient temperature**



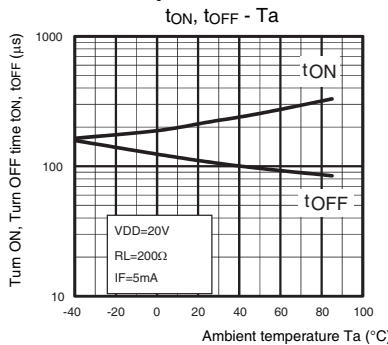
**Trigger LED forward current vs. Ambient temperature**



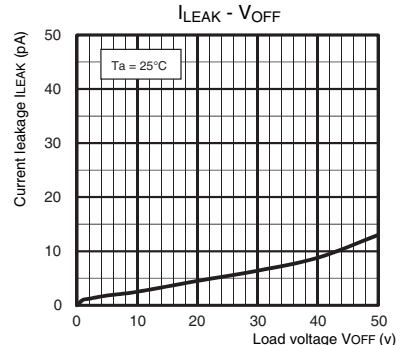
**Turn ON, Turn OFF time vs. LED forward current**



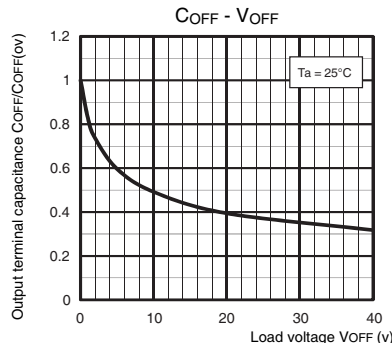
**Turn ON, Turn OFF time vs. Ambient temperature**



**Current leakage vs. Load voltage**



**Output terminal capacitance COFF/COFF(ov) vs. Load voltage**



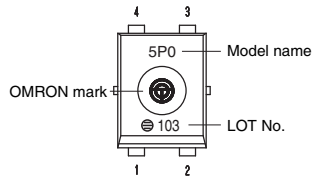
## Safety Precautions

- Refer to "Common Precautions" for all G3VM models.

## ■Appearance

### USOP (Ultra Small Outline Package)

USOP4



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

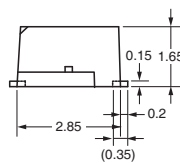
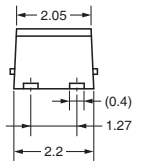
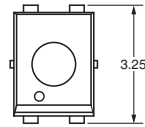
## ■Dimensions

(Unit: mm)



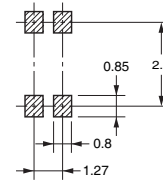
### Surface-mounting Terminals

Weight: 0.03g



### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



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

- Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
- Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

**Note:** Do not use this document to operate the Unit.