

# G3VM-61PR□/71PR/81PR/101PR

MOS FET Relays USOP, Small and High-load-voltage Type

## USOP Package with High Load voltage

- Load voltage: 60 V, 75 V, 80 V, or 100 V
- G3VM-61PR1: Low  $C \times R = 7 \text{ pF}\cdot\Omega$ ,  $C_{OFF}$  (standard) = 0.7 pF,  $R_{ON}$  (standard) = 10  $\Omega$

RoHS Compliant



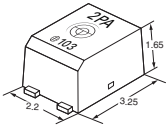
**Note:** The actual product is marked differently from the image shown here.

### Application Examples

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

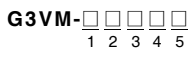
### Package (Unit : mm, Average)

USOP 4-pin



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

### Model Number Legend



- |  |   |  |
|--|---|--|
| <b>1. Load Voltage</b><br>6: 60 V<br>7: 75 V<br>8: 80 V<br>10: 100 V | <b>2. Contact form</b><br>1: 1a (SPST-NO) | <b>3. Package</b><br>P: USOP 4-pin   |
| <b>4. Additional functions</b><br>R: Low On-resistance               |   | <b>5. Other informations</b><br>When specifications overlap, serial code is added in the recorded order. |

### Ordering Information

Package	Contact form	Terminals	Load voltage (peak value) *	Continuous load current (peak value) *	Tape cut packaging		Tape packaging	
					Model	Minimum package quantity	Model	Minimum package quantity
USOP4	1a (SPST-NO)	Surface-mounting Terminals	60 V	120 mA	G3VM-61PR1	1 pc.	G3VM-61PR1(TR05)	500 pcs.
			75 V	400 mA	G3VM-61PR		G3VM-61PR(TR05)	
			80 V	120 mA	G3VM-71PR		G3VM-71PR(TR05)	
			100 V	100 mA	G3VM-81PR		G3VM-81PR(TR05)	
						G3VM-101PR	G3VM-101PR(TR05)	

**Note:** To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.  
 Tape-cut USOPs are packaged without humidity resistance. Use manual soldering to mount them.  
 Refer to common precautions.  
 \* The AC peak and DC value are given for the load voltage and continuous load current.

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

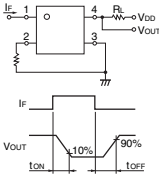
Item	Symbol	G3VM-61PR1	G3VM-61PR	G3VM-71PR	G3VM-81PR	G3VM-101PR	Unit	Measurement conditions	
LED forward current	IF	50						mA	
LED forward current reduction rate	$\Delta I_f/^\circ C$	-0.5						mA/°C	Ta≥25°C
LED reverse voltage	VR	5						V	
Connection temperature	TJ	125						°C	
Load voltage (AC peak/DC)	Voff	60		75	80	100	V		
Continuous load current (AC peak/DC)	Io	120	400	120	100		mA		
ON current reduction rate	$\Delta I_o/^\circ C$	-1.2	-4	-1.2	-1		mA/°C	Ta≥25°C	
Pulse ON current	Iop	360	1,200	360	300		mA	t=100 ms, Duty=1/10	
Connection temperature	TJ	125						°C	
Dielectric strength between I/O (See note 1.)	VI-o	500						Vrms	AC for 1 min
Ambient operating temperature	Ta	-40 to +85						°C	With no icing or condensation
Ambient storage temperature	Tstg	-40 to +125						°C	
Soldering temperature	-	260						°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		G3VM-61PR1	G3VM-61PR	G3VM-71PR	G3VM-81PR	G3VM-101PR	Unit	Measurement conditions
LED forward voltage	VF	Minimum	1.0				V	IF=10 mA	
		Typical	1.15						
		Maximum	1.3						
Reverse current	IR	Maximum	10				μA	VR=5 V	
Capacitance between terminals	CT	Typical	15				pF	V=0, f=1 MHz	
Trigger LED forward current	IFT	Typical	1.0	0.5	0.6	0.5	mA	Io=100 mA	
		Maximum	3						
Release LED forward current	IFC	Minimum	0.1	0.2	0.1		mA	IOFF=10 μA	
		Typical	10	1	7	8			
Maximum resistance with output ON	RON	Maximum	15	1.5	12	14	Ω	G3VM-61PR : IF=5 mA, Io=400 mA Others : IF=5 mA, Io=Continuous load current ratings, t<1 s	
		Typical	10	1	7	8			
Current leakage when the relay is open	I <sub>LEAK</sub>	Maximum	1				nA	Voff=Load voltage ratings	
Capacitance between terminals	COFF	Typical	0.7	20	30	5	6	pF	G3VM-61PR : V=0, f=1 MHz, t<1 s Others : V=0, f=100 MHz, t<1 s
		Maximum	1.3	30	-	7	8		
Capacitance between I/O terminals	CI-O	Typical	0.4	0.3	0.4		pF	f=1 MHz, Vs=0 V	
Insulation resistance between I/O terminals	RI-O	Maximum	1000				MΩ	VI-o=500 VDC, RoHs:60%	
		Typical	10 <sup>8</sup>						
Turn-ON time	TON	Typical	0.04	0.3	0.4	0.14	0.12	ms	IF=5 mA, RL=200 Ω, VDD=20 V (See note 2.)
		Maximum	0.2	0.5	2	0.5	0.3		
Turn-OFF time	TOFF	Typical	0.12	0.3	0.2	0.16	0.18	ms	IF=5 mA, RL=200 Ω, VDD=20 V (See note 2.)
		Maximum	0.2	0.5	1	0.2	0.3		

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



## Recommended Operating Conditions

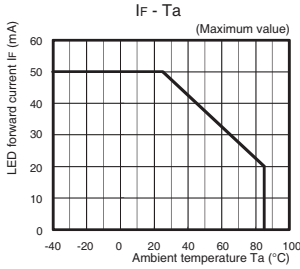
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

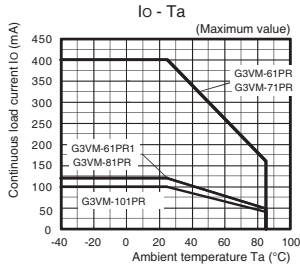
Item	Symbol		G3VM-61PR1	G3VM-61PR	G3VM-71PR	G3VM-81PR	G3VM-101PR	Unit
Load voltage (AC peak/DC)	VDD	Maximum	48		60	64	80	V
		Minimum	5					
Operating LED forward current	IF	Typical	7.5				mA	
		Maximum	20					
		Minimum						
Continuous load current (AC peak/DC)	Io	Maximum	120	400	120	100	mA	
		Minimum	-20					
Ambient operating temperature	Ta	Minimum	-40				°C	
		Maximum	65					

### Engineering Data

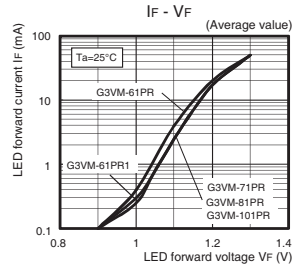
#### LED forward current vs. Ambient temperature



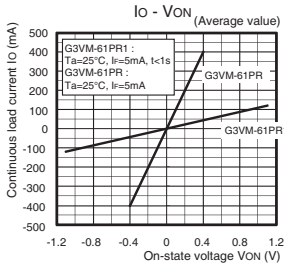
#### Continuous load current vs. Ambient temperature



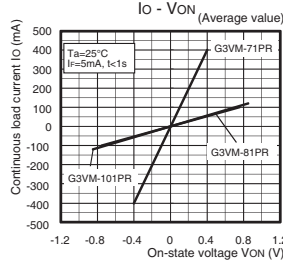
#### LED forward current vs. LED forward voltage



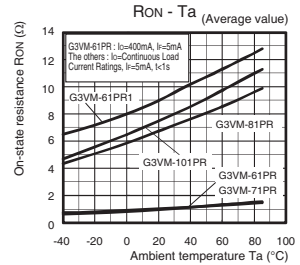
#### Continuous load current vs. On-state voltage



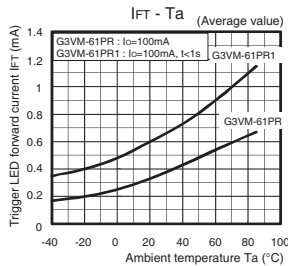
#### G3VM-71PR/81PR/101PR



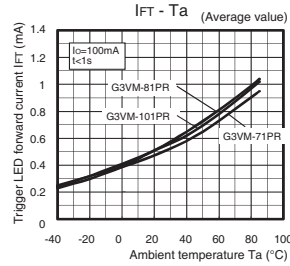
#### On-state resistance vs. Ambient temperature



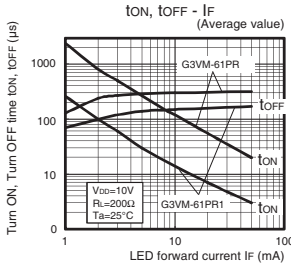
#### Trigger LED forward current vs. Ambient temperature



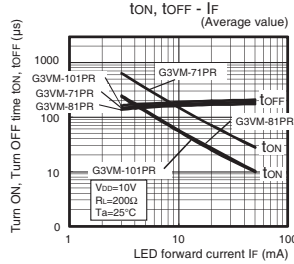
#### G3VM-71PR/81PR/101PR



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



#### G3VM-71PR/81PR/101PR

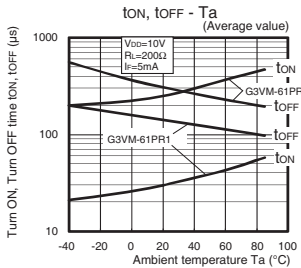


## Engineering Data

### Turn ON, Turn OFF time vs.

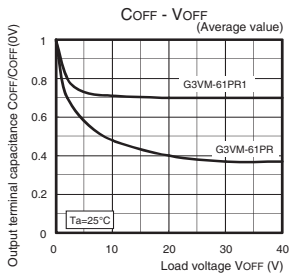
#### Ambient temperature

G3VM-61PR1/61PR

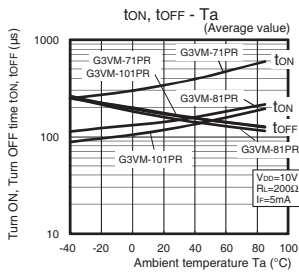


### Output terminal capacitance vs. Load voltage

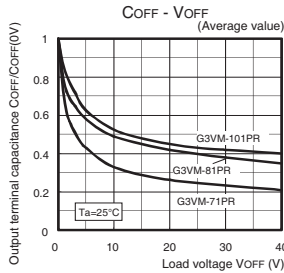
G3VM-61PR1/61PR



G3VM-71PR/81PR/101PR

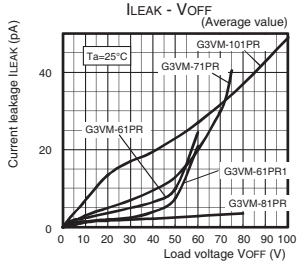


G3VM-71PR/81PR/101PR



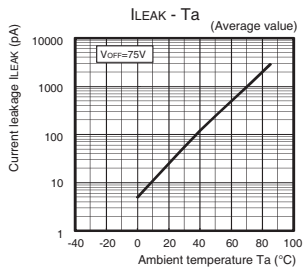
### Current leakage vs.

#### Load voltage



### Current leakage vs. Ambient temperature

G3VM-71PR

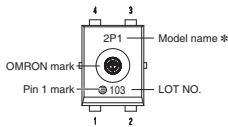


### ■ Appearance / Terminal Arrangement / Internal Connections

#### ● Appearance

##### USOP (Ultra Small Outline Package)

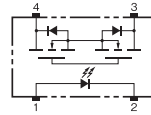
USOP 4-pin



\* Actual model name marking for each model

Model	Marking
G3VM-61PR1	6P1
G3VM-61PR	6P0
G3VM-71PR	7P0
G3VM-81PR	8P0
G3VM-101PR	AP0

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

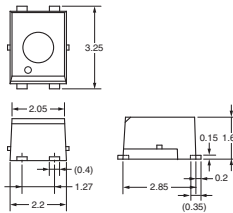
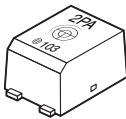


**Note:** 1. The actual product is marked differently from the image shown here.  
**Note:** 2. "G3VM" does not appear in the model number on the Relay.

### ■ Dimensions (Unit: mm)

#### Surface-mounting Terminals

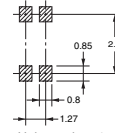
Weight: 0.03 g



Unless otherwise specified, the dimensional tolerance is  $\pm 0.2$  mm.

#### Actual Mounting Pad Dimensions


(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is  $\pm 0.2$  mm.

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### ■ 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.

Introduction  
General-purpose  
High-side-voltage  
Multi-contact pair  
(2a, 2b, and 1a1)  
High-current and  
Low-ON-resistance  
Small and high-  
dielectric-strength  
High-dielectric-  
strength  
Current-limiting  
Low-robot-sensitivity  
and low-ON-resistance  
Small and High-  
side-voltage  
Certified Models with  
Schematics Certification  
DIP  
SOP  
SSOP  
USOP  
VSON

G3VM-61PR□/71PR/81PR/101PR