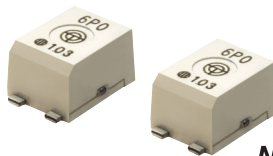


# G3VM-21PR□

MOS FET Relays USOP, Low-output-capacitance and Low-ON-resistance Type (with Low C × R)

## USOP Package with Low Output Capacitance and ON Resistance

- Load voltage: 20 V
- G3VM-21PR10: Low C × R = 2.4 pF·Ω, C<sub>OFF</sub> (standard) = 0.8 pF, R<sub>ON</sub> (standard) = 3 Ω
- G3VM-21PR1: Low C × R = 3 pF·Ω, C<sub>OFF</sub> (standard) = 5 pF, R<sub>ON</sub> (standard) = 0.6 Ω
- G3VM-21PR11: Low C × R = 7.2 pF·Ω, C<sub>OFF</sub> (standard) = 40 pF, R<sub>ON</sub> (standard) = 0.18 Ω



**NEW**

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

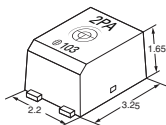
RoHS Compliant

### 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

G3VM-□□□□□  
 1 2 3 4 5

- 1. Load Voltage**  
 2: 20 V
- 2. Contact form**  
 1: 1a (SPST-NO)
- 3. Package**  
 P: USOP 4 pin
- 4. Additional functions**  
 R: Low On-resistance
- 5. Other informations**  
 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	20 V	200 mA	G3VM-21PR10	1 pc.	G3VM-21PR10(TR05)	500 pcs.
				450 mA	G3VM-21PR1		G3VM-21PR1(TR05)	
				900 mA	G3VM-21PR11		G3VM-21PR11(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)

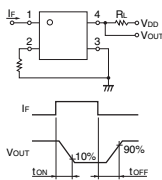
Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions		
Input	LED forward current	IF	50			mA	Ta≥25°C	
	LED forward current reduction rate	ΔIF/°C	-0.5			mA/°C		
	LED reverse voltage	VR	5			V		
	Connection temperature	TJ	125			°C		
Output	Load voltage (AC peak/DC)	V <sub>OFF</sub>	20			V	G3VM-21PR10/21PR1 : Ta ≥ 25°C G3VM-21PR11 : Ta ≥ 50°C	
	Continuous load current (AC peak/DC)	Io	200	450	900	mA		
	ON current reduction rate	ΔIo/°C	-2.0	-4.5	-12	mA/°C		
	Pulse ON current	I <sub>op</sub>	600	1,300	2,700	mA		I <sub>on</sub> =100 ms, Duty=1/10
	Connection temperature	TJ	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	Ta	-40 to +85			°C	With no icing or condensation		
Ambient storage temperature	Tstg	-40 to +125			°C			
Soldering temperature	-	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.

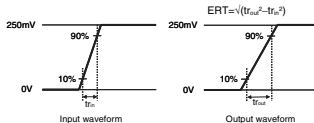
## ■Electrical Characteristics (Ta = 25°C)

Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions		
Input	LED forward voltage	VF	Minimum 1.0 Typical 1.15 Maximum 1.3			V	IF=10 mA	
		Reverse current	IR	Maximum 10			μA	VR=5 V
		Capacitance between terminals	CT	Typical 15			pF	V=0, f=1 MHz
Output	Trigger LED forward current	IFT	1	0.6		mA	I <sub>o</sub> =100 mA	
		Maximum	3					
	Release LED forward current	IFC	Minimum 0.1			mA	I <sub>OFF</sub> =10 μA	
		Maximum resistance with output ON	RON	3	0.6	0.18	Ω	IF=5 mA, t<1 s I <sub>o</sub> =Continuous load current ratings
	Current leakage when the relay is open	ILEAK	Maximum 1			nA	V <sub>OFF</sub> =20 V	
		Capacitance between terminals	COFF	0.8	5	40	pF	V=0, f=100 MHz, t<1 s
Capacitance between I/O terminals	CI-O	Typical 0.4			pF	f=1 MHz, VS=0 V		
Insulation resistance between I/O terminals	RI-O	Minimum	1000			MΩ	VI-O=500VDC, RoH=±60%	
		Typical	10 <sup>8</sup>					
Turn-ON time	tON	Typical	0.04	0.2	0.5	ms	IF=5 mA, RL=200 Ω, V <sub>DD</sub> =10 V (See note 2.)	
		Maximum	0.2	0.5	2			
Turn-OFF time	tOFF	Typical	0.13	0.2	0.1	ms	IF=5 mA, RL=200 Ω, V <sub>DD</sub> =10 V (See note 2.)	
		Maximum	0.2	0.5	1			
Equivalent rise time	ERT	Typical	-	40	-	ps	IF=5 mA, V <sub>DD</sub> =0.25 V, Tr(in)=25 ps (See note.3)	
		Maximum	-	90	-			

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



**Note: 3.** Equivalent Rise Time



## ■Recommended Operating Conditions

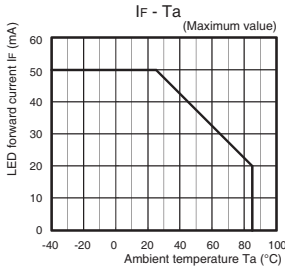
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

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

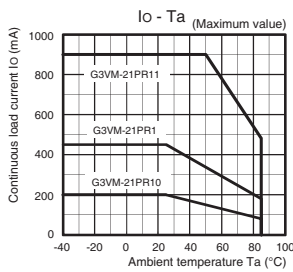
Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit
Load voltage (AC peak/DC)	V <sub>DD</sub>	Maximum	16		V
		Minimum	5		
Operating LED forward current	IF	Typical	7.5		mA
		Maximum	20		
		Minimum	-		
Continuous load current (AC peak/DC)	I <sub>o</sub>	Maximum	200	450	900
		Minimum	-		
Ambient operating temperature	Ta	Minimum	-20		
		Maximum	65		

## Engineering Data

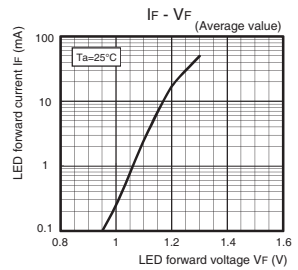
### LED forward current vs. Ambient temperature



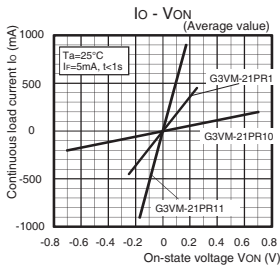
### Continuous load current vs. Ambient temperature



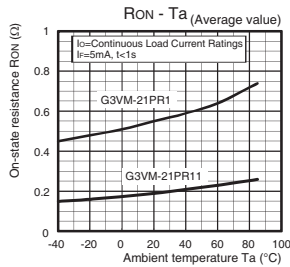
### LED forward current vs. LED forward voltage



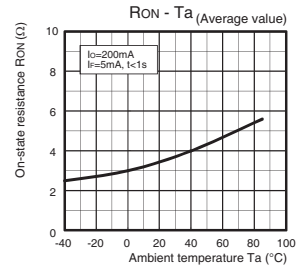
### Continuous load current vs. On-state voltage



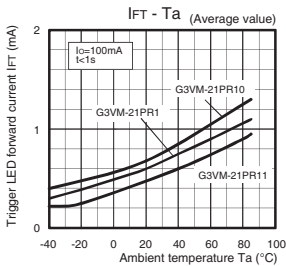
### On-state resistance vs. Ambient temperature



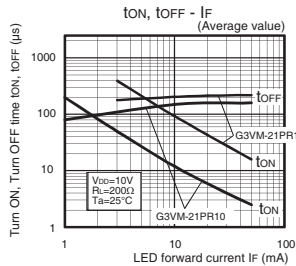
### G3VM-21PR10



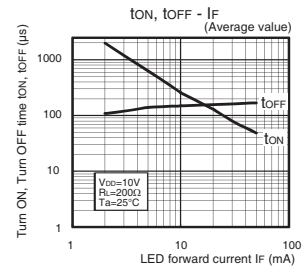
### Trigger LED forward current vs. Ambient temperature



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



### G3VM-21PR11

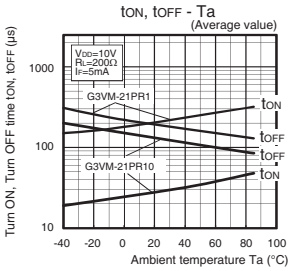


Introduction  
General purpose  
High-side-voltage  
Multi-contact pair  
(2a, 2b, and 1a1)  
High-current and  
Low-ON-resistance  
Small and high-  
inductive strength  
High-dielectric-  
strength  
Current-limiting  
Low-voltage  
Small and High-  
side-voltage  
Certified Models with  
Statistical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

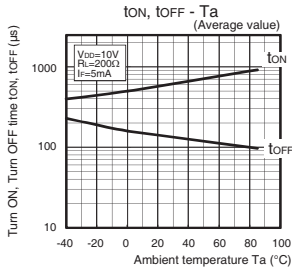
G3VM-21PR□

## Engineering Data

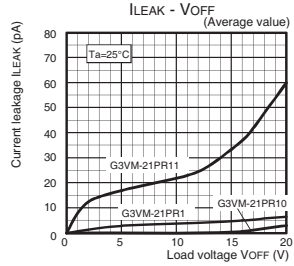
### Turn ON, Turn OFF time vs. Ambient temperature G3VM-21PR10/21PR1



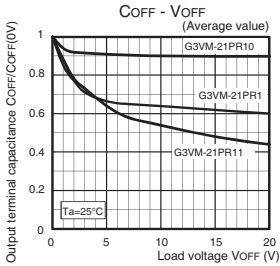
### G3VM-21PR11



### Current leakage vs. Load voltage



### Output terminal capacitance vs. Load voltage

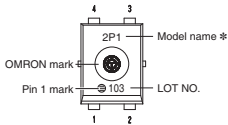


### ■ Appearance / Terminal Arrangement / Internal Connections

#### ● Appearance

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

USOP 4-pin

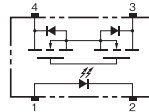


\* Actual model name marking for each model

Model	Marking
G3VM-21PR10	2PA
G3VM-21PR1	2P1
G3VM-21PR11	2PB

**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.

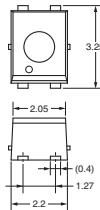
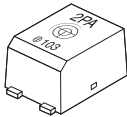
#### ● Terminal Arrangement/Internal Connections (Top View)



### ■ Dimensions (Unit: mm)

#### Surface-mounting Terminals

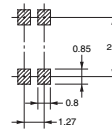
Weight: 0.03 g



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.

**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.