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 voltance: 20 V**
- **G3VM-21PR10: Low C × R = 2.4 pF·Ω, COFF (standard) = 0.8 pF, RON (standard) = 3 Ω**
- **G3VM-21PR1: Low C × R = 3 pF·Ω, COFF (standard) = 5 pF, RON (standard) = 0.6 Ω**
- **G3VM-21PR11: Low C × R = 7.2 pF·Ω, COFF (standard) = 40 pF, RON (standard) = 0.18 Ω**

RoHS Compliant

NEW

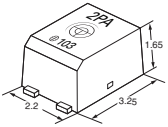
Note: The actual product is marked differently from the image shown here.

■Application Examples

- **Semiconductor test equipment**
- **Test & measurement equipment**
- **Communication 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.

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G3VM-21PR□

■Absolute Maximum Ratings (Ta = 25°C)

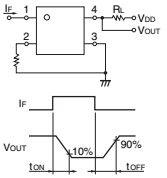
	Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions
Input	LED forward current	I_F	50			mA	
	LED forward current reduction rate	ΔI_F/°C	−0.5			mA/°C	Ta≥25°C
	LED reverse voltage	V_R	5			V	
	Connection temperature	T_J	125			°C	
Output	Load voltage (AC peak/DC)	V_{OFF}	20			V	
	Continuous load current (AC peak/DC)	I_O	200	450	900	mA	
	ON current reduction rate	ΔI_O/°C	−2.0	−4.5	−12	mA/°C	G3VM-21PR10/21PR1 : Ta ≥ 25°C G3VM-21PR11 : Ta ≥ 50°C
	Pulse ON current	I_{op}	600	1,300	2,700	mA	t=100 ms, Duty=1/10
	Connection temperature	T_J	125			°C	
Dielectric strength between I/O (See note 1.)		V_{I-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	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.

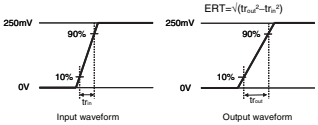
■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions
Input	LED forward voltage	V_F	Minimum	1.0			V	I_F=10 mA
			Typical	1.15				
			Maximum	1.3				
	Reverse current	I_R	Maximum	10			μA	V_R=5 V
	Capacitance between terminals	C_T	Typical	15			pF	V=0, f=1 MHz
	Trigger LED forward current	I_{FT}	Typical	1	0.6		mA	I_O=100 mA
			Maximum	3				
	Release LED forward current	I_{FC}	Minimum	0.1			mA	I_{OFF}=10 μA
Output	Maximum resistance with output ON	R_{ON}	Typical	3	0.6	0.18	Ω	I_F=5 mA, t<1 s I_O=Continuous load current ratings
			Maximum	5	1.2	0.22		
	Current leakage when the relay is open	I_{LEAK}	Maximum	1			nA	V_{OFF}=20 V
	Capacitance between terminals	C_{OFF}	Typical	0.8	5	40	pF	V=0, f=100 MHz, t<1 s
			Maximum	1.1	12	–		
Capacitance between I/O terminals		C_{I-O}	Typical	0.4			pF	f=1 MHz, V_S=0 V
Insulation resistance between I/O terminals		R_{I-O}	Minimum	1000			MΩ	V_{I-O}=500VDC, RoH≤60%
			Typical	10^8				
Turn-ON time		t_{ON}	Typical	0.04	0.2	0.5	ms	I_F=5 mA, R_L=200 Ω, V_{DD}=10 V (See note 2.)
			Maximum	0.2	0.5	2		
Turn-OFF time		t_{OFF}	Typical	0.13	0.2	0.1		
			Maximum	0.2	0.5	1		
Equivalent rise time		ERT	Typical	–	40	–	ps	I_F=5 mA, V_{DD}=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

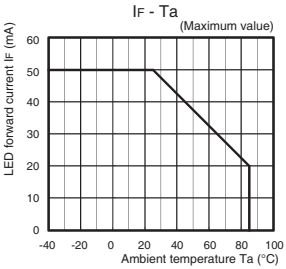
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

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

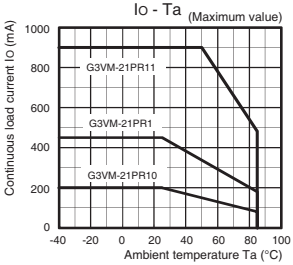
Item	Symbol		G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit
Load voltage (AC peak/DC)	V_{DD}	Maximum	16			V
Operating LED forward current	I_F	Minimum	5			mA
		Typical	7.5			
		Maximum	20			
Continuous load current (AC peak/DC)	I_O	Maximum	200	450	900	
Ambient operating temperature	Ta	Minimum	−20			°C
		Maximum	65			

■Engineering Data

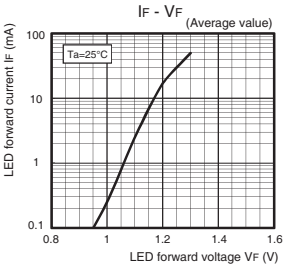
●**LED forward current vs. Ambient temperature**



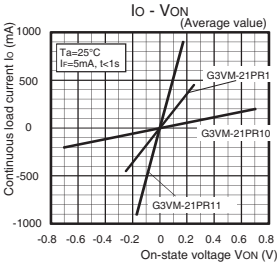
●**Continuous load current vs. Ambient temperature**



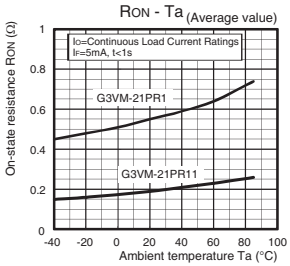
●**LED forward current vs. LED forward voltage**



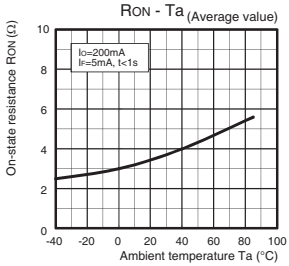
●**Continuous load current vs. On-state voltage**



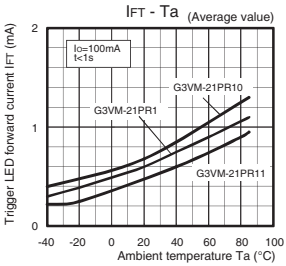
●**On-state resistance vs. Ambient temperature**
G3VM-21PR1/21PR11



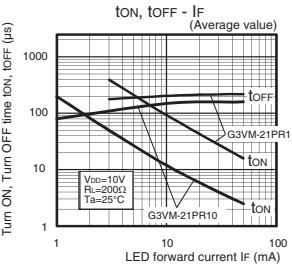
G3VM-21PR10



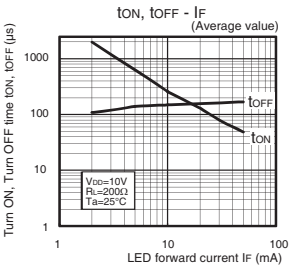
●**Trigger LED forward current vs. Ambient temperature**



●**Turn ON, Turn OFF time vs. LED forward current**
G3VM-21PR10/21PR1



G3VM-21PR11

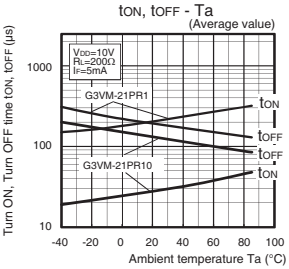


G3VM-21PR□

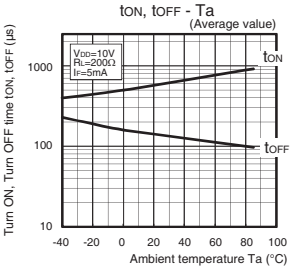
■Engineering Data

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

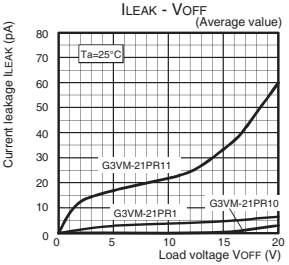
G3VM-21PR10/21PR1



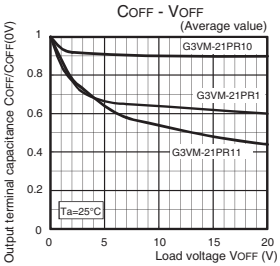
G3VM-21PR11



●**Current leakage vs. Load voltage**



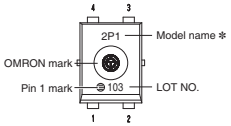
●**Output terminal capacitance vs. Load voltage**



■Appearance / Terminal Arrangement / Internal Connections

●Appearance

USOP (Ultra Small Outline Package)
USOP 4-pin

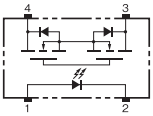


✻ Actual model name marking for each model

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.

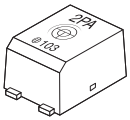
●Terminal Arrangement/Internal Connections (Top View)

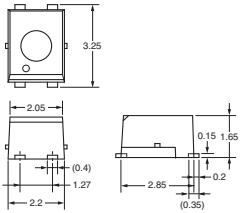


■Dimensions (Unit: mm)

Surface-mounting Terminals

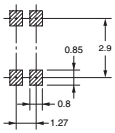
Weight: 0.03 g





Unless otherwise specified, the dimensional tolerance is ± 0.2 mm.

Actual Mounting Pad Dimensions
(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ± 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.

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G3VM-21PR1(TR05)