

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_{OFF} (standard) = 0.8 pF, R_{ON} (standard) = 3 Ω
- G3VM-21PR1: Low C × R = 3 pF·Ω, C_{OFF} (standard) = 5 pF, R_{ON} (standard) = 0.6 Ω
- G3VM-21PR11: Low C × R = 7.2 pF·Ω, C_{OFF} (standard) = 40 pF, R_{ON} (standard) = 0.18 Ω



NEW

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

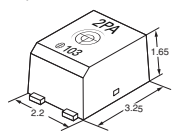
RoHS Compliant

Application Examples

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

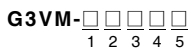
Package (Unit : mm, Average)

USOP 4-pin



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

Model Number Legend



- 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)

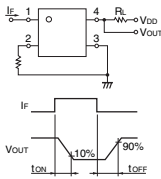
Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions		
Input	LED forward current	IF	50			mA	Ta≥25°C	
	LED forward current reduction rate	ΔIF/°C	-0.5			mA/°C		
	LED reverse voltage	VR	5			V		
	Connection temperature	TJ	125			°C		
Output	Load voltage (AC peak/DC)	V _{OFF}	20			V	G3VM-21PR10/21PR1 : 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	Iop	600	1,300	2,700	mA		
	Connection temperature	TJ	125			°C		
	Dielectric strength between I/O (See note 1.)	V _{I-O}	500			V _{rms}		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.

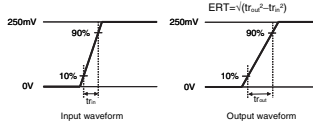
Electrical Characteristics (Ta = 25°C)

Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	Measurement conditions	
Input	LED forward voltage	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	1	0.6		mA
Release LED forward current	IFC	Minimum	0.1			mA	IOFF=10 μA
		Maximum resistance with output ON	RON	3	0.6	0.18	Ω
Current leakage when the relay is open	ILEAK	Maximum	1			nA	V _{OFF} =20 V
		Capacitance between terminals	COFF	Typical 0.8	5	40	pF
Capacitance between I/O terminals	C _{I-O}	Typical	0.4			pF	f=1 MHz, VS=0 V
		Insulation resistance between I/O terminals	R _{I-O}	Minimum 1000	1000		MΩ
Turn-ON time	t _{ON}	Typical	0.04	0.2	0.5	ms	If=5 mA, RL=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	ms	If=5 mA, RL=200 Ω, V _{DD} =10 V (See note 2.)
		Maximum	0.2	0.5	1		
Equivalent rise time	ERT	Typical	40			ps	If=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

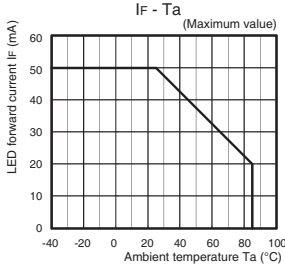
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

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

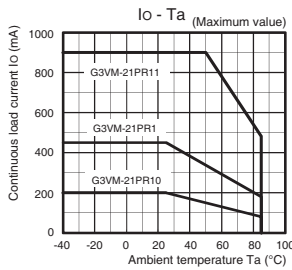
Item	Symbol	G3VM-21PR10	G3VM-21PR1	G3VM-21PR11	Unit	
Load voltage (AC peak/DC)	V _{DD}	16			V	
Operating LED forward current	IF	Minimum	5			mA
		Typical	7.5			
		Maximum	20			
Continuous load current (AC peak/DC)	Io	Maximum	200	450	900	°C
		Ambient operating temperature	Ta	Minimum -20		
			Maximum 65			

Engineering Data

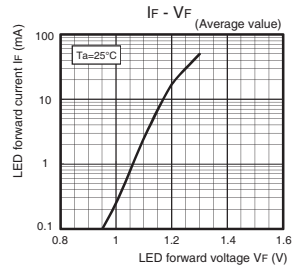
LED forward current vs. Ambient temperature



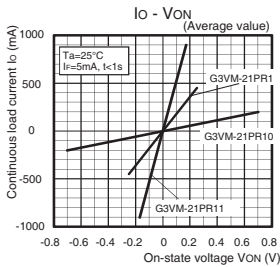
Continuous load current vs. Ambient temperature



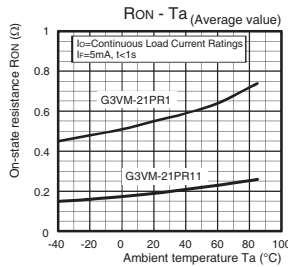
LED forward current vs. LED forward voltage



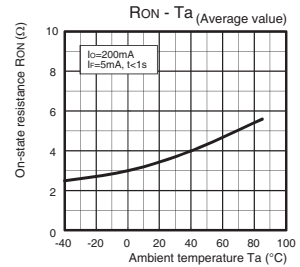
Continuous load current vs. On-state voltage



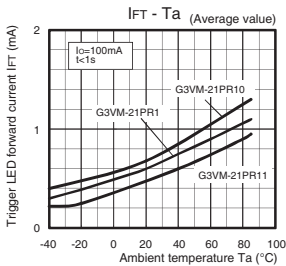
On-state resistance vs. Ambient temperature



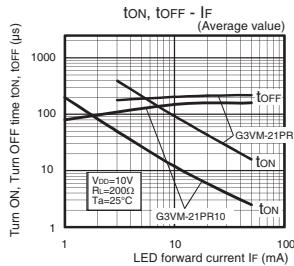
G3VM-21PR10



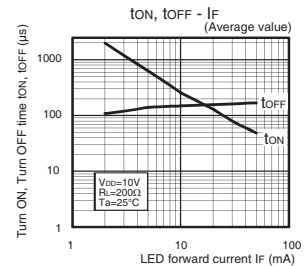
Trigger LED forward current vs. Ambient temperature



Turn ON, Turn OFF time vs. LED forward current

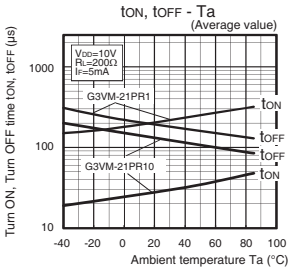


G3VM-21PR11

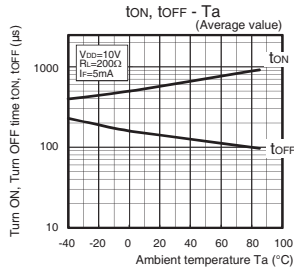


Engineering Data

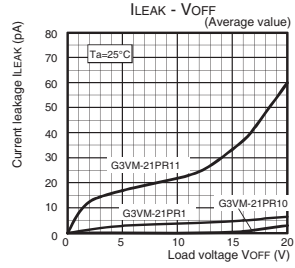
Turn ON, Turn OFF time vs. Ambient temperature G3VM-21PR10/21PR1



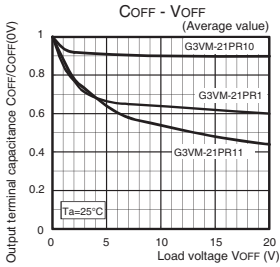
G3VM-21PR11



Current leakage vs. Load voltage



Output terminal capacitance vs. Load voltage

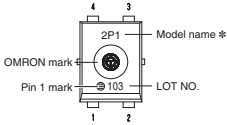


■ Appearance / Terminal Arrangement / Internal Connections

● Appearance

USOP (Ultra Small Outline Package)

USOP 4-pin

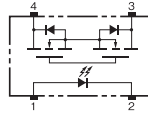


* Actual model name marking for each model

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.

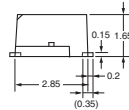
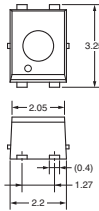
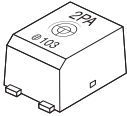
● Terminal Arrangement/Internal Connections (Top View)



■ Dimensions (Unit: mm)

Surface-mounting Terminals

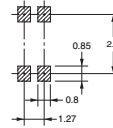
Weight: 0.03 g



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.

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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.