

Introduction
General-purpose
High-foot-voltage
Multi-contact-type
(2A, 2A, and 1A)
High-current and
Low-ON-resistance
Small and high-
insulative strength
High-electric-
strength
Current-limiting
Low-voltage
and Low-ON-resistance
Small and high-
insulative strength
Standard models with
certification

G3VM-41PR□/51PR

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

USOP Package with Low Output Capacitance and ON Resistance

- Load voltage: 40 V or 50 V
- G3VM-41PR12: Low $C \times R = 4.5 \text{ pF} \cdot \Omega$, C_{OFF} (standard) = 0.3 pF, R_{ON} (standard) = 15 Ω
- G3VM-41PR6: Low $C \times R = 10 \text{ pF} \cdot \Omega$, C_{OFF} (standard) = 1 pF, R_{ON} (standard) = 10 Ω
- G3VM-41PR10: Low $C \times R = 5.4 \text{ pF} \cdot \Omega$, C_{OFF} (standard) = 0.45 pF, R_{ON} (standard) = 12 Ω
- G3VM-41PR11: Low $C \times R = 4.9 \text{ pF} \cdot \Omega$, C_{OFF} (standard) = 0.7 pF, R_{ON} (standard) = 7 Ω
- G3VM-41PR5: Low $C \times R = 10 \text{ pF} \cdot \Omega$, C_{OFF} (standard) = 10 pF, R_{ON} (standard) = 1 Ω
- G3VM-51PR: Low $C \times R = 12 \text{ pF} \cdot \Omega$, C_{OFF} (standard) = 12 pF, R_{ON} (standard) = 1 Ω

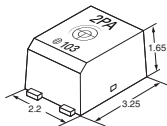
RoHS Compliant

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

4: 40 V
5: 50 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	40 V	100 mA	G3VM-41PR12	1 pc.	G3VM-41PR12(TR05)	500 pcs.
				120 mA	G3VM-41PR6		G3VM-41PR6(TR05)	
				140 mA	G3VM-41PR11		G3VM-41PR10(TR05)	
				300 mA	G3VM-41PR5		G3VM-41PR11(TR05)	
				300 mA	G3VM-51PR		G3VM-41PR5(TR05)	
			50 V	300 mA			G3VM-51PR(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)

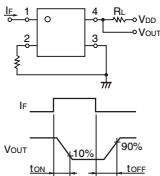
Item	Symbol	G3VM-41PR12	G3VM-41PR6	G3VM-41PR10	G3VM-41PR11	G3VM-41PR5	G3VM-51PR	Unit	Measurement conditions
Input	LED forward current	IF	50					mA	
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.5					mA/°C	Ta≥25°C
	LED reverse voltage	VR	5					V	
Output	Connection temperature	TJ	125					°C	
	Load voltage (AC peak/DC)	V _{OFF}	40				50	V	
	Continuous load current (AC peak/DC)	Io	100	120	140	300		mA	
	ON current reduction rate	$\Delta I_O/^\circ\text{C}$	-1.0	-1.2	-1.4	-3		mA/°C	Ta≥25°C
	Pulse ON current	Iop	300	360	420	900		mA	t=100 ms, Duty=1/10
	Connection temperature	TJ	125					°C	
	Dielectric strength between I/O (See note 1.)	V _{IO}	500					Vrms	AC for 1 min
Ambient operating temperature		Ta	-40 to +85					°C	
Ambient storage temperature		Tstg	-40 to +125					°C	With no icing or condensation
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.

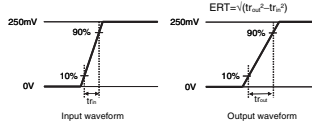
■Electrical Characteristics (Ta = 25°C)

Item		Symbol	G3VM-41PR12 G3VM-41PR6 G3VM-41PR10 G3VM-41PR11 G3VM-41PR5 G3VM-51PR								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	0.6	0.5	1.0	0.6	0.5	mA	I _O =100 mA		
Maximum	3												
Release LED forward current	I _{FC}	Minimum	0.1						0.2	mA	I _{OFF} =10 μA		
Output	Maximum resistance with output ON	R _{ON}	Typical	15	10	12	7	1		Ω	I _F =5 mA, t<1 s I _O =Continuous load current ratings		
		Maximum	20	15	14	10	1.5						
	Current leakage when the relay is open	I _{LEAK}	Maximum	1	0.2	1					nA	V _{OFF} =Load voltage ratings	
	Capacitance between terminals	C _{OFF}	Typical	0.3	1	0.45	0.7	10	12	pF	V=0, f=100 MHz, t<1 s		
		Maximum	0.6	2	0.8	1.3	14	—					
	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} =500 VDC, R _{oH} ≤60%
		Typical	10 ⁸										
Turn-ON time	t _{ON}	Typical	0.04	0.05	0.03	0.04	0.2			ms	I _F =5 mA, R _L =200 Ω, V _{OD} =20 V (See note2.)		
		Maximum	0.2					0.5					
Turn-OFF time	t _{OFF}	Typical	0.12	0.16	0.2	0.14	0.2	0.1					
		Maximum	0.2	0.3			0.2	0.3	0.4				
Equivalent rise time	ERT	Typical	—							40	ps	I _F =5 mA, V _{OD} =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.

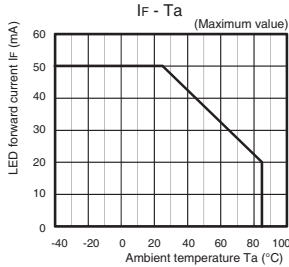
Item	Symbol		G3VM-41PR12	G3VM-41PR6	G3VM-41PR10	G3VM-41PR11	G3VM-41PR5	G3VM-51PR	Unit
Load voltage (AC peak/DC)	V _{OD}	Maximum	32					40	V
Operating LED forward current	IF	Minimum	5					mA	
		Typical	7.5						
		Maximum	20						
Continuous load current (AC peak/DC)	Io	Maximum	100	120	140	300			
Ambient operating temperature	Ta	Minimum	-20					°C	
		Maximum	65						

G3VM-41PR□/51PR

MOS FET Relays

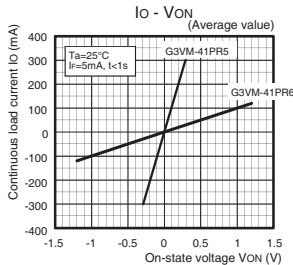
■Engineering Data

●LED forward current vs. Ambient temperature



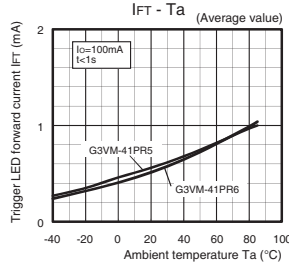
●Continuous load current vs. On-state voltage

G3VM-41PR6/41PR5



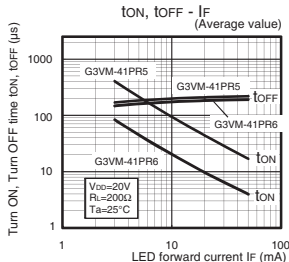
●Trigger LED forward current vs. Ambient temperature

G3VM-41PR6/41PR5

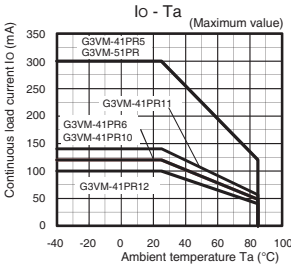


●Turn ON, Turn OFF time vs. LED forward current

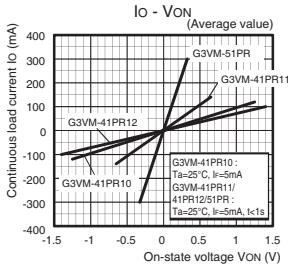
G3VM-41PR6/41PR5



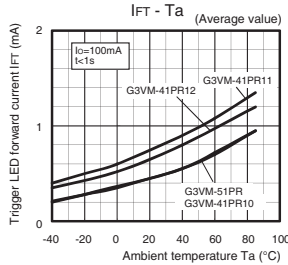
●Continuous load current vs. Ambient temperature



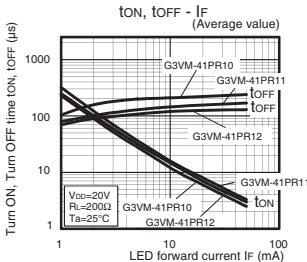
G3VM-41PR12/41PR10/41PR11/51PR



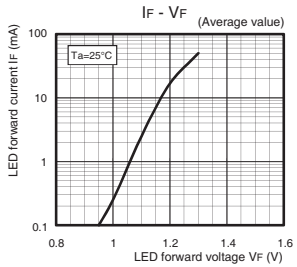
G3VM-41PR12/41PR10/41PR11/51PR



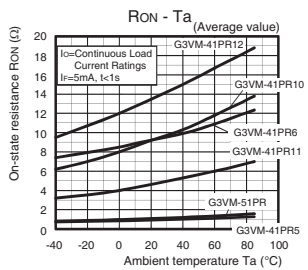
G3VM-41PR12/41PR10/41PR11



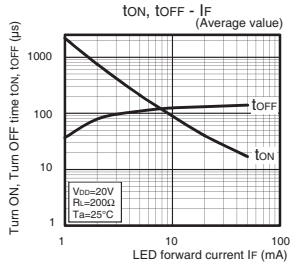
●LED forward current vs. LED forward voltage



●On-state resistance vs. Ambient temperature



G3VM-51PR

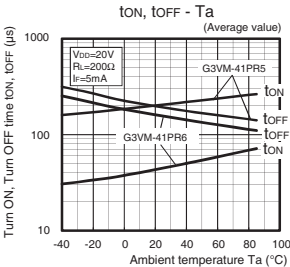


Engineering Data

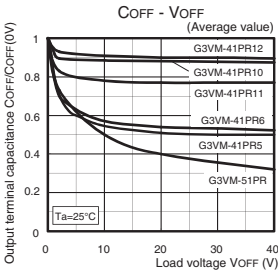
● Turn ON, Turn OFF time vs.

Ambient temperature

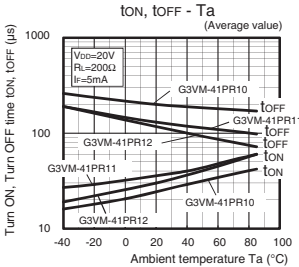
G3VM-41PR6/41PR5



● Output terminal capacitance vs. Load voltage

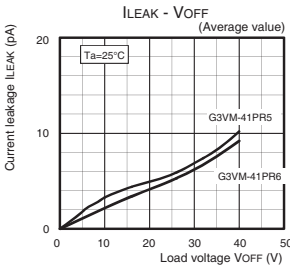


G3VM-41PR12/41PR10/41PR11

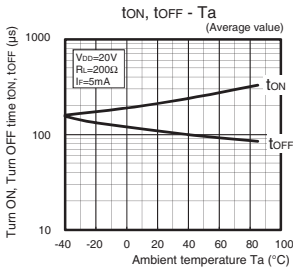


● Current leakage vs. Load voltage

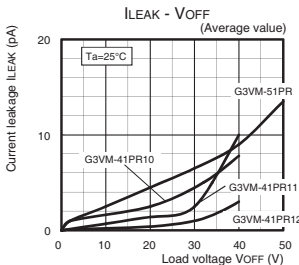
G3VM-41PR6/41PR5



G3VM-51PR



G3VM-41PR12/41PR10/41PR11/51PR



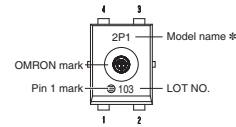
G3VM-41PR□/51PR

MOS FET Relays

■Appearance / Terminal Arrangement / Internal Connections

●Appearance

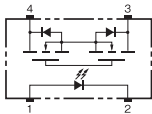
USOP (Ultra Small Outline Package)
USOP 4-pin



* Actual model name marking for each model

Model	Marking
G3VM-41PR12	4PC
G3VM-41PR6	4P6
G3VM-41PR10	4PA
G3VM-41PR11	4PB
G3VM-41PR5	4P5
G3VM-51PR	5P0

●Terminal Arrangement/Internal Connections (Top View)

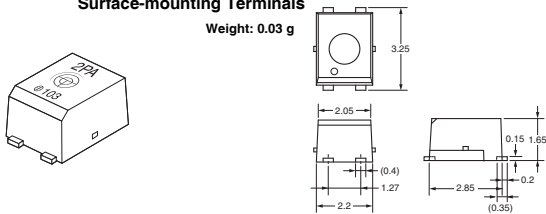


Note: 1. The actual product is marked differently from the image shown here.
Note: 2. "G3VM" does not appear in the model number on the Relay.

■Dimensions (Unit: mm)

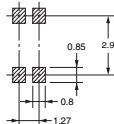
Surface-mounting Terminals

Weight: 0.03 g



Unless otherwise specified, the dimensional tolerance is ± 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.