G3VM-41PR□/51PR

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

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

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

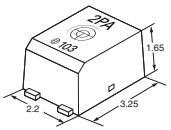
RoHS Compliant

■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**
   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)	
					G3VM-41PR10		G3VM-41PR10(TR05)	
				140 mA	G3VM-41PR11		G3VM-41PR11(TR05)	
				300 mA	G3VM-41PR5		G3VM-41PR5(TR05)	
			50 V	300 mA	G3VM-51PR		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.

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■Absolute Maximum Ratings (Ta = 25°C)

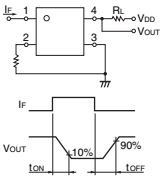
Item		Symbol	G3VM-41PR12	G3VM-41PR6	G3VM-41PR10	G3VM-41PR11	G3VM-41PR5	G3VM-51PR	Unit	Measurement conditions
Input	LED forward current	IF	50						mA	
	LED forward current reduction rate	ΔIF/°C	−0.5						mA/°C	Ta≥25°C
	LED reverse voltage	VR	5						V	
	Connection temperature	TJ	125						°C	
Output	Load voltage (AC peak/DC)	VOFF	40					50	V	
	Continuous load current (AC peak/DC)	Io	100	120		140	300		mA	
	ON current reduction rate	ΔIo/°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.)		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	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.

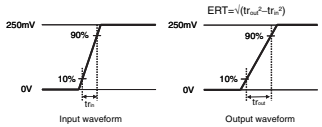
■Electrical Characteristics (Ta = 25°C)

Item		Symbol		G3VM-41PR12	G3VM-41PR6	G3VM-41PR10	G3VM-41PR11	G3VM-41PR5	G3VM-51PR	Unit	Measurement conditions
Input	LED forward voltage	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	0.6	0.5	1.0	0.6	0.5	mA	Io=100 mA
			Maximum	3							
	Release LED forward current	IFC	Minimum	0.1					0.2	mA	IOFF=10 μA
Output	Maximum resistance with output ON	RON	Typical	15	10	12	7	1		Ω	IF=5 mA, t<1 s Io=Continuous load current ratings
			Maximum	20	15	14	10	1.5			
	Current leakage when the relay is open	ILEAK	Maximum	1	0.2	1				nA	VOFF=Load voltage ratings
	Capacitance between terminals	COFF	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		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=500 VDC, RoH≤60%
			Typical	10^8							
Turn-ON time		tON	Typical	0.04	0.05	0.03	0.04	0.2		ms	IF=5 mA, RL=200 Ω, VDD=20 V (See note2.)
			Maximum	0.2				0.5			
Turn-OFF time		tOFF	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	IF=5 mA, VDD=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)	VDD	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						

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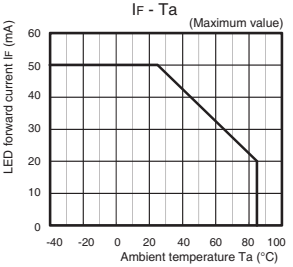
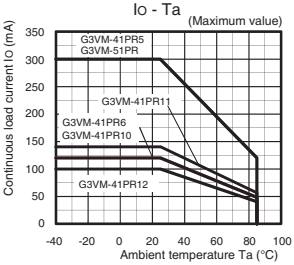
G3VM-41PR□/51PR

■Engineering Data

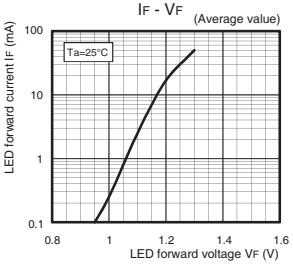
●LED forward current vs. Ambient temperature



●Continuous load current vs. Ambient temperature

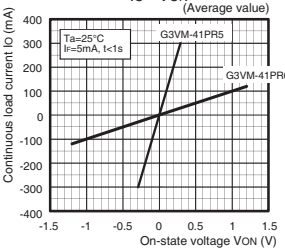


●LED forward current vs. LED forward voltage

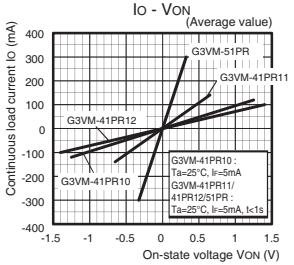


●Continuous load current vs. On-state voltage

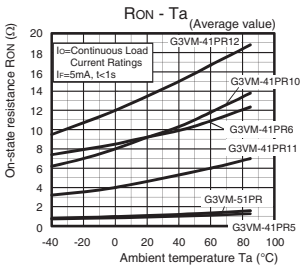
G3VM-41PR6/41PR5



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

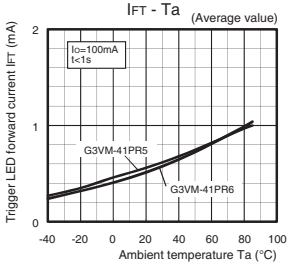


●On-state resistance vs. Ambient temperature

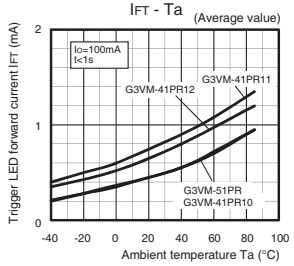


●Trigger LED forward current vs. Ambient temperature

G3VM-41PR6/41PR5

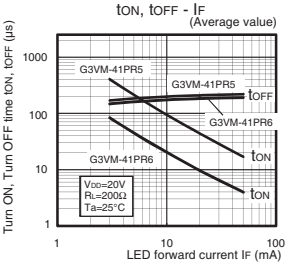


G3VM-41PR12/41PR10/41PR11/51PR

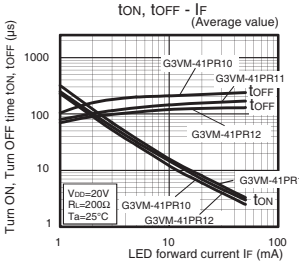


●Turn ON, Turn OFF time vs. LED forward current

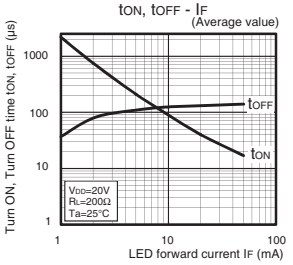
G3VM-41PR6/41PR5



G3VM-41PR12/41PR10/41PR11



G3VM-51PR



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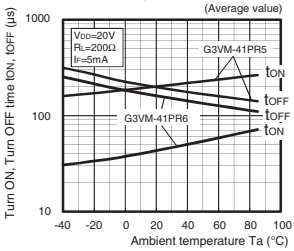
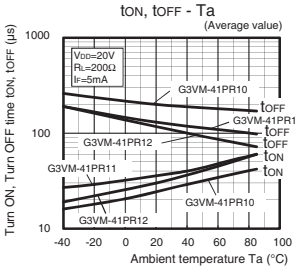
■Engineering Data

●Turn ON, Turn OFF time vs. Ambient temperature

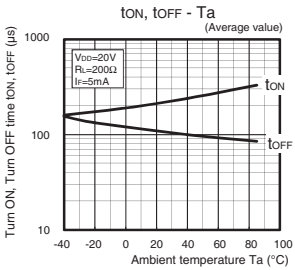
G3VM-41PR6/41PR5



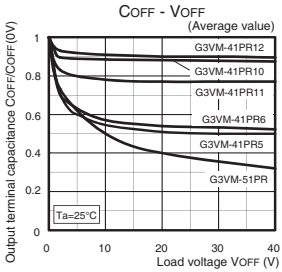
G3VM-41PR12/41PR10/41PR11



G3VM-51PR

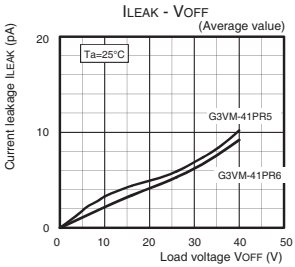


●Output terminal capacitance vs. Load voltage

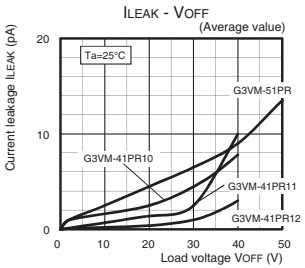


●Current leakage vs. Load voltage

G3VM-41PR6/41PR5



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



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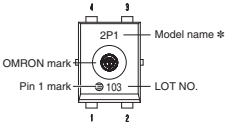
G3VM-41PR□/51PR

■Appearance / Terminal Arrangement / Internal Connections

●Appearance

USOP (Ultra Small Outline Package)

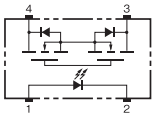
USOP 4-pin



✻ 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)



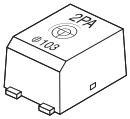
Note: 1. The actual product is marked differently from the image shown here.

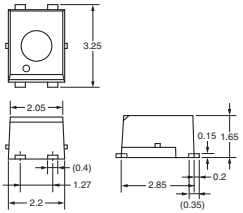
Note: 2. "G3VM" does not appear in the model number on the Relay.

■Dimensions (Unit: mm)

Surface-mounting Terminals

Weight: 0.03 g

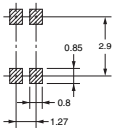




Unless otherwise specified, the dimensional tolerance is ± 0.2 mm.

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.

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