

G3VM-41GR8/61GR2/61VR

MOS FET Relays SOP 4-pin, High-current and Low-ON-resistance Type

MOS FET Relays in SOP4-pin that featuring the low ON resistance and high switching capacity as a mechanical relay.

- Load voltage: 40 V or 60 V
- 40-V Relay: Continuous load current of 1 A max.
- 60-V Relay: Continuous load current of 1.7 A max.

RoHS Compliant

Application Examples

- Semiconductor test equipment
- Security equipment
- Amusement equipment
- Test & Measurement equipment
- Industrial equipment
- Power circuit
- Communication equipment

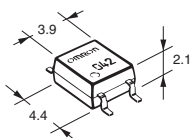


Note: The actual product is marked differently from the image shown here.

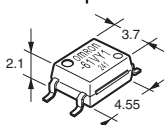
Package

(Unit : mm, Average)

SOP 4-pin



Special SOP 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

6 : 60 V

4. Additional function

R: Low ON resistance

2. Contact form

1 : 1a (SPST-NO)

3. Package

G : SOP 4-pin

V: Special SOP 4-pin

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) *	Stick packaging		Tape packaging	
					Model	Minimum package quantity	Model	Minimum package quantity
SOP4	1a (SPST-NO)	Surface-mounting Terminals	40 V	1000 mA	G3VM-41GR8	100 pcs.	G3VM-41GR8(TR)	2,500 pcs.
			60 V	1400 mA	G3VM-61VR	125 pcs.	G3VM-61VR(TR05)	500 pcs.
				1700 mA	G3VM-61GR2	100 pcs.	G3VM-61GR2(TR05)	500 pcs.

* The AC peak and DC value are given for the load voltage and continuous load current.

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" or "(TR05)" to the end of the model number.

Absolute Maximum Ratings (Ta = 25°C)

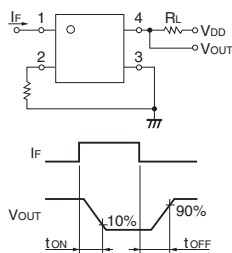
Item		Symbol	G3VM-41GR8	G3VM-61VR	G3VM-61GR2	Unit	Measurement conditions
Input	LED forward current	IF	30	50	30	mA	
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.3	-0.5	-0.3	mA/°C	Ta ≥ 25°C
	LED reverse voltage	VR	5	6	5	V	
Output	Connection temperature	TJ	125			°C	
	Load voltage (AC peak/DC)	V _{OFF}	40	60		V	
	Continuous load current (AC peak/DC)	I _o	1000	1400	1700	mA	
	ON current reduction rate	$\Delta I_o/^\circ\text{C}$	-13.3	-14	-17	mA/°C	G3VM-41GR8/61GR1: Ta ≥ 50°C G3VM-61VR/61GR2: Ta ≥ 25°C
	Pulse ON current	I _{op}	2	4.2	5	A	t=100 ms, Duty=1/10
	Connection temperature	TJ	125			°C	
	Dielectric strength between I/O *	V _{I-O}	1500	3750	1500	V _{rms}	AC for 1 min
Ambient operating temperature		Ta	-40 to +85	-40 to +110	-40 to +85	°C	With no icing or condensation
Ambient storage temperature		T _{stg}	-55 to +125	-40 to +125	-55 to +125	°C	
Soldering temperature		—	260			°C	10 s

* 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-41GR8	G3VM-61VR	G3VM-61GR2	Unit	Measurement conditions	
Input	LED forward voltage	V _F	Minimum	1.18	1.1	1.18	V	I _F =10 mA	
			Typical	1.33	1.27	1.33			
			Maximum	1.48	1.4	1.48			
	Reverse current	I _R	Maximum	10			μA	V _R =5 V	
	Capacitance between terminals	C _T	Typical	70			pF	V=0, f=1 MHz	
	Trigger LED forward current	I _{FT}	Typical	1		0.6	mA	G3VM-41GR8/61GR2: I _o =100 mA G3VM-61VR: I _o =1400 mA	
Maximum			3						
Release LED forward current		I _{FC}	Minimum	0.1			mA	I _{OFF} =100 μA	
Output	Maximum resistance with output ON	R _{ON}	Typical	0.1	0.13	0.08	Ω	G3VM-41GR8: I _F =5mA, I _o = Continuous load current ratings G3VM-61GR2/61VR: I _F =5mA, I _o = Continuous load current ratings, t<1s	
			Maximum	0.13	0.25	0.13			
	Current leakage when the relay is open	I _{LEAK}	Typical	—	2	1	nA	G3VM-41GR8: V _{OFF} =30 V G3VM-61VR/61GR2: V _{OFF} =60 V	
			Maximum	1	1000	10			
	Capacitance between terminals	C _{OFF}	Typical	300	100	250	pF	V=0, f=1 MHz	
	Capacitance between I/O terminals		C _{I-O}	Typical	0.8			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	1.2	2	0.7	ms	I _F =5 mA, R _L =200 Ω, V _{DD} =20 V *	
			Maximum	3					
Turn-OFF time	t _{OFF}	Typical	0.2	0.1	0.1				
		Maximum	0.5	1	0.5				

* Turn-ON and Turn-OFF Times



■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.

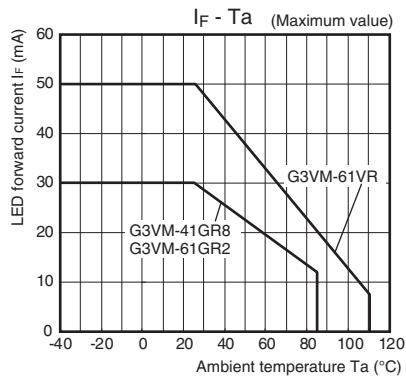
Item	Symbol		G3VM-41GR8	G3VM-61VR	G3VM-61GR2	Unit
Load voltage (AC peak/DC)	V _{DD}	Maximum	32	48		V
Operating LED forward current	I _F	Maximum	5			mA
		Typical	10	7.5	10	
		Maximum	20	25		
Continuous load current (AC peak/DC)	I _o	Maximum	1000	1400	1300	
Ambient operating temperature	T _a	Minimum	-20			°C
		Maximum	60	100	65	

■Spacing and Insulation

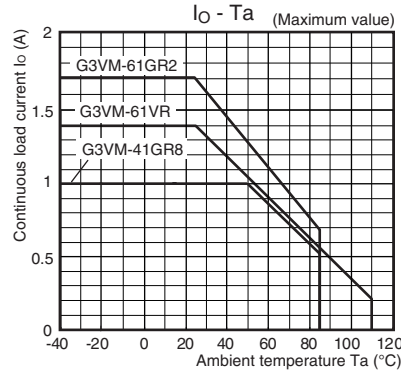
Item	G3VM-□GR□	G3VM-61VR	Unit
	Minimum		
Creepage distances	4.0	5.0	mm
Clearance distances	4.0	5.0	
Internal isolation thickness	0.1	0.2	

Engineering Data

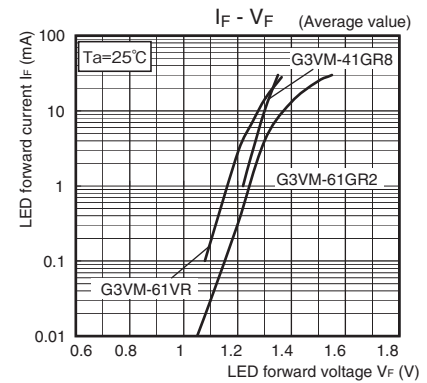
LED forward current vs. Ambient temperature



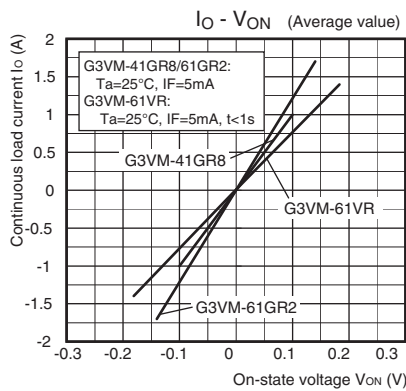
Continuous load current vs. Ambient temperature



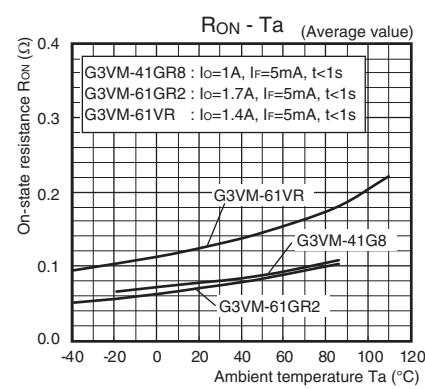
LED forward current vs. LED forward voltage



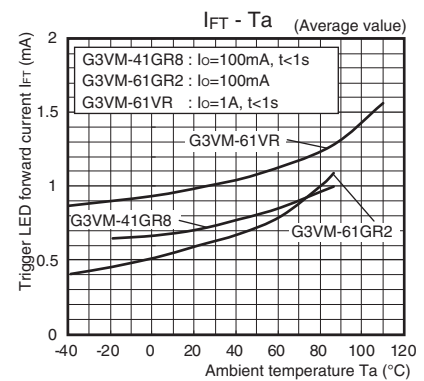
Continuous load current vs. On-state voltage



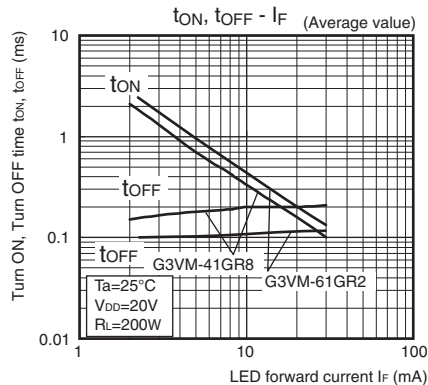
On-state resistance vs. Ambient temperature



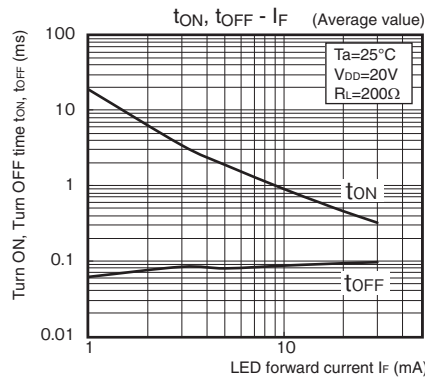
Trigger LED forward current vs. Ambient temperature



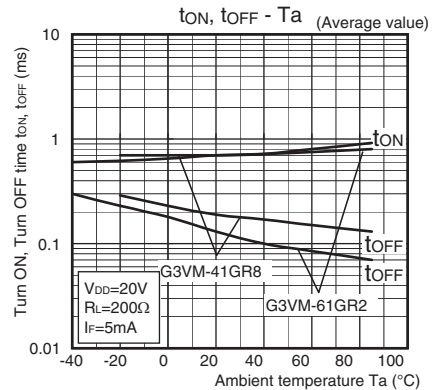
Turn ON, Turn OFF time vs. LED forward current



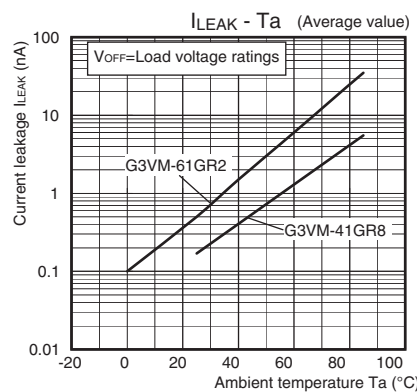
G3VM-61VR



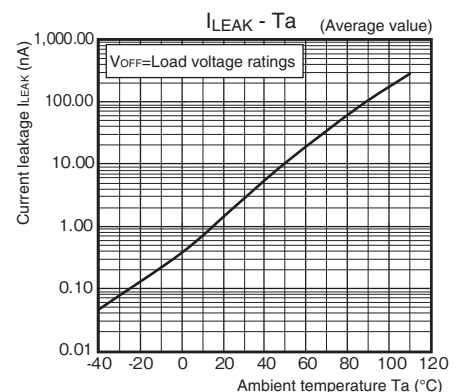
Turn ON, Turn OFF time vs. Ambient temperature



Current leakage vs. Ambient temperature



G3VM-61VR

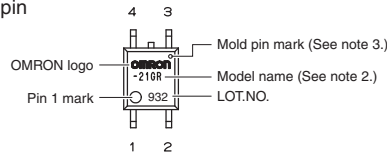


■Appearance / Terminal Arrangement / Internal Connections

●Appearance

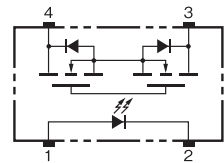
SOP (Small Outline Package)

SOP 4-pin



- 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.
Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

●Terminal Arrangement/Internal Connections (Top View)



■Dimensions (Unit: mm)

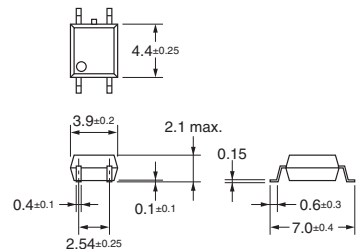
SOP (Small Outline Package)

SOP 4-pin

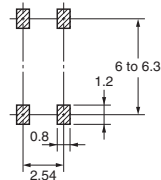


Surface-mounting Terminals

Weight: 0.1 g

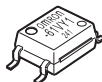


Actual Mounting Pad Dimensions (Recommended Value, Top View)



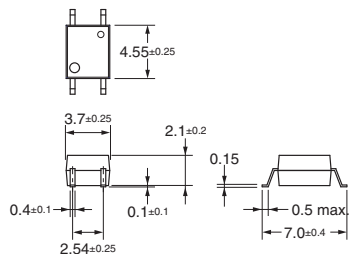
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Special SOP 4-pin * (G3VM-61VR)

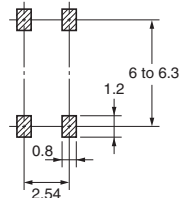


Surface-mounting Terminals

Weight: 0.1 g



Actual Mounting Pad Dimensions (Recommended Value, Top View)



* The external dimensions are different from those of the standard SOP 4-pin, but the mounting pad dimensions are the same.

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

■Approved Standards

UL recognized

Model	Approved Standards	Contact form	File No.
G3VM-41GR8 G3VM-61GR2 G3VM-61VR	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.

SOP

G3VM-41GR8/61GR2/61VR

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