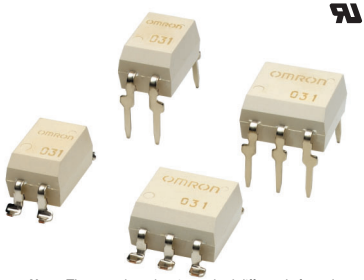
G3VM-□A□/□D□/□B□/□E□

MOS FET Relays DIP, General-purpose Type

General-purpose MOS FET Relays in DIP packages for a wide range of applications

- **Package: DIP 4-pin or DIP 6-pin**
- **Contact form: 1a (SPST-NO) or 1b (SPST-NC)**
- **Load voltage: 60 V, 350 V, or 400 V**



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

RoHS Compliant

■Application Examples

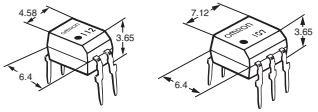
- **Communication equipment**
- **Security equipment**
- **Power circuit**
- **Test & Measurement equipment**
- **Industrial equipment**

■Package

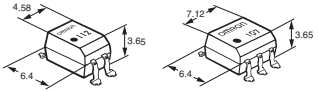
(Unit : mm, Average)

DIP 4-pin DIP 6-pin

PCB Terminals



Surface-mounting Terminals



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

■Model Number Legend

G3VM-□□□□
1 2 3 4

1. Load Voltage
6 : 60 V
35 : 350 V
40 : 400 V

2. Contact form
1 : 1a (SPST-NO)
3 : 1b (SPST-NC)

3. Package
A : DIP 4-pin with PCB terminals
B : DIP 6-pin with PCB terminals
D : DIP 4-pin with surface-mounting terminals
E : DIP 6-pin with surface-mounting terminals

4. Other informations
When specifications overlap, serial code is added recorded order.

■Ordering Information

Package	Contact form	Load voltage (peak value) ✻	Continuous load current (peak value) ✻	Stick packaging			Tape packaging	
				Model		Minimum package quantity	Model	Minimum package quantity
				PCB Terminals	Surface-mounting Terminals		Surface-mounting Terminals	
DIP4	1a (SPST-NO)	60 V	500 mA	G3VM-61A1	G3VM-61D1	100 pcs.	G3VM-61D1(TR)	1,500 pcs.
		350 V	120 mA	G3VM-351A	G3VM-351D		G3VM-351D(TR)	
	1b (SPST-NC)		150 mA	G3VM-353A	G3VM-353D		G3VM-353D(TR)	
	1a (SPST-NO)	400 V	120 mA	G3VM-401A	G3VM-401D		G3VM-401D(TR)	

Package	Contact form	Load voltage (peak value) ✻	Continuous load current (peak value) ✻		Stick packaging			Tape packaging	
					Model		Minimum package quantity	Model	Minimum package quantity
			Connection A, B	Connection C	PCB Terminals	Surface-mounting Terminals		Surface-mounting Terminals	
DIP6	1a (SPST-NO)	60 V	500 mA	1000 mA	G3VM-61B1	G3VM-61E1	50 pcs.	G3VM-61E1(TR)	1,500 pcs.
		350 V	120 mA	240 mA	G3VM-351B	G3VM-351E		G3VM-351E(TR)	
	1b (SPST-NC)		150 mA	300 mA	G3VM-353B	G3VM-353E		G3VM-353E(TR)	
	1a (SPST-NO)	400 V	120 mA	240 mA	G3VM-401B	G3VM-401E		G3VM-401E(TR)	

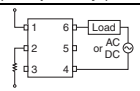
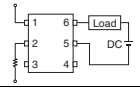
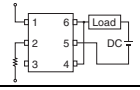
✻ The AC peak and DC value are given for the load voltage and continuous load current.
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

■Absolute Maximum Ratings (Ta = 25°C)

Item			Symbol	G3VM-61A1 G3VM-61D1	G3VM-61B1 G3VM-61E1	G3VM-351A G3VM-351D	G3VM-351B G3VM-351E	G3VM-353A G3VM-353D	G3VM-353B G3VM-353E	G3VM-401A G3VM-401D	G3VM-401B G3VM-401E	Unit	Measurement conditions
Input	LED forward current		IF	50								mA	
	Repetitive peak LED forward current		IFP	1								A	100 μs pulses, 100 pps
	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	60		350				400		V	
	Continuous load current (AC peak/DC)	Connection A	IO	500		120		150		120		mA	Connection A: AC peak/DC Connection B and C: DC
		Connection B		–	500	–	120	–	150	–	120		
		Connection C		–	1000	–	240	–	300	–	240		
	ON current reduction rate	Connection A	ΔIO/°C	-5		-1.2		-1.5		-1.2		mA/°C	Ta ≥ 25°C
		Connection B		–	-5	–	-1.2	–	-1.5	–	-1.2		
		Connection C		–	-10	–	-2.4	–	-3	–	-2.4		
	Pulse ON current		IOP	1.5		0.36		0.45		0.36		A	t=100 ms, Duty=1/10
	Connection temperature		TJ	125								°C	
Dielectric strength between I/O (See note 1.)			VI-O	2,500								Vrms	AC for 1 min
Ambient operating temperature			Ta	-40 to +85								°C	With no icing or condensation
Ambient storage temperature			Tstg	-55 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.

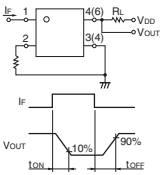
Connection Diagram (DIP 6-pin Relays)

Connection A	
Connection B	
Connection C	

■Electrical Characteristics (Ta = 25°C)

	Item	Symbol			G3VM-61A1 G3VM-61D1	G3VM-61B1 G3VM-61E1	G3VM-351A G3VM-351D	G3VM-351B G3VM-351E	G3VM-353A G3VM-353D	G3VM-353B G3VM-353E	G3VM-401A G3VM-401D	G3VM-401B G3VM-401E	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		30								pF	V=0, f=1 MHz
	Trigger LED forward current	IFT (IFC) (See note 3.)	Typical		1.6		1						mA	G3VM-353A/353D/353B/353E : IOFF=10 μA Others : IO=Continuous load current ratings
			Maximum		3									
	Release LED forward current	IFC (IFT) (See note 3.)	Minimum		0.1								mA	G3VM-353A/353D/353B/353E : IO=150 mA Others : IOFF=100 μA
Output	Maximum resistance with output ON	RON	Typical	Connection A	1		35 (25)		15		18	17	Ω	G3VM-61A1/61D1/61B1/61E1/351A/351D/351B/351E/401A/401D/401B/401E : IF=5 mA, IO=Continuous load current ratings Values in parentheses are for t < 1 s. G3VM-353A/353D/353B/353E : IO=Continuous load current ratings
				Connection B	–	0.5	–	28	–	8	–	11		
				Connection C		0.25		14		4		6		
			Maximum	Connection A	2		50 (35)		25		35			
				Connection B	–	1	–	40	–	14	–	20		
				Connection C	–			20		7		10		
	Current leakage when the relay is open	ILEAK	Maximum		1								μA	G3VM-353A/353D/353B/353E : IF=5mA, VOFF=Load voltage ratings Others : VOFF=Load voltage ratings
	Capacitance between terminals	COFF	Typical		130		30		85		40		pF	V=0, f=1 MHz
Capacitance between I/O terminals		CI-O	Typical		0.8								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		0.8		0.3		0.1		–	0.3	ms	IF=5 mA, RL=200 Ω, VDD=10 V (See note 2.)
			Maximum		2		1							
Turn-OFF time		tOFF	Typical		0.1			1		–	0.1			
			Maximum		0.5		1		3		1			

Note: 2. Turn-ON and Turn-OFF Times



Note: 3. These values are for Relays with NC contacts

■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.

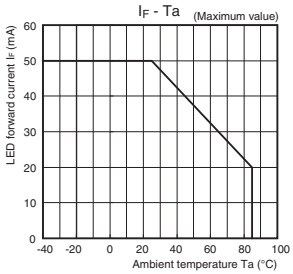
Item	Symbol		G3VM-61A1 G3VM-61D1	G3VM-61B1 G3VM-61E1	G3VM-351A G3VM-351D	G3VM-351B G3VM-351E	G3VM-353A G3VM-353D	G3VM-353B G3VM-353E	G3VM-401A G3VM-401D	G3VM-401B G3VM-401E	Unit
Load voltage (AC peak/DC)	VDD	Maximum	48		280				320		V
Operating LED forward current	IF	Minimum	5								mA
		Typical	7.5			10		–	7.5		
		Maximum	25								
Continuous load current (AC peak/DC)	IO	Maximum	500		100		150		100	120	
Ambient operating temperature	Ta	Minimum	-20								°C
		Maximum	65								

■Spacing and Insulation

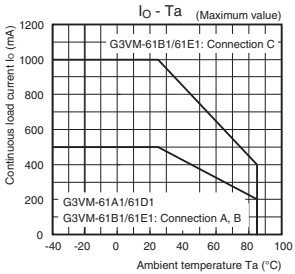
Item	Minimum	Unit
Creepage distances	7.0	mm
Clearance distances	7.0	
Internal isolation thickness	0.4	

■Engineering Data

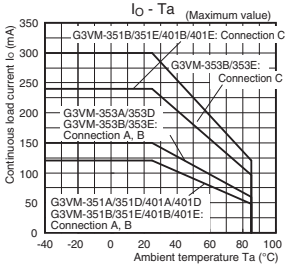
● LED forward current vs. Ambient temperature



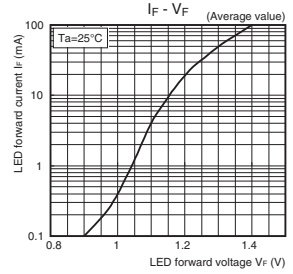
● Continuous load current vs. Ambient temperature
G3VM-61A1/61D1/61B1/61E1



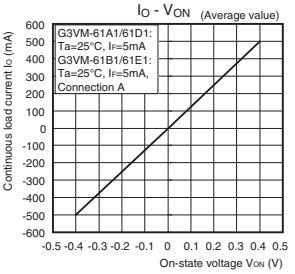
G3VM-351A/351D/351B/351E
G3VM-353A/353D/353B/353E
G3VM-401A/401D/401B/401E



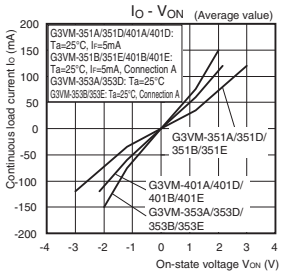
● LED forward current vs. LED forward voltage



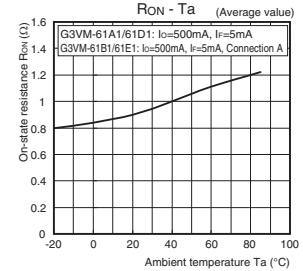
● Continuous load current vs. On-state voltage
G3VM-61A1/61D1/61B1/61E1



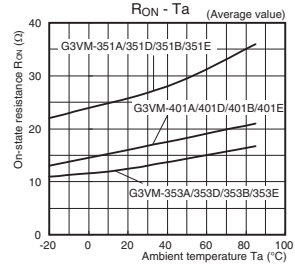
G3VM-351A/351D/351B/351E
G3VM-353A/353D/353B/353E
G3VM-401A/401D/401B/401E



● On-state resistance vs. Ambient temperature
G3VM-61A1/61D1/61B1/61E1

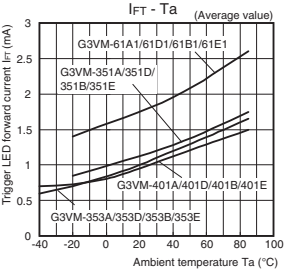


G3VM-351A/351D/351B/351E
G3VM-353A/353D/353B/353E
G3VM-401A/401D/401B/401E



G3VM-351A/351D/401A/401D:
IO=120mA, IF=5mA, t<1s
G3VM-351B/351E/401B/401E:
IO=120mA, IF=5mA, t<1s, Connection A
G3VM-353A/353D: IO=150mA, t<1s
G3VM-353B/353E: IO=150mA, t<1s, Connection A

● Trigger LED forward current vs. Ambient temperature



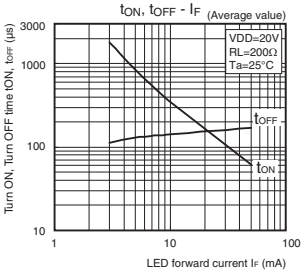
G3VM-61A1/61D1/351A/351D/401A/401D:
IO=Continuous Load Current Ratings, t<1s
G3VM-61B1/61E1/351B/351E/401B/401E:
IO=Continuous Load Current Ratings, t<1s, Connection A
G3VM-353A/353D: IOFF=10μA
G3VM-353B/353E: IOFF=10μA, Connection A

G3VM-□A□/□D□/□B□/□E□ MOS FET Relays

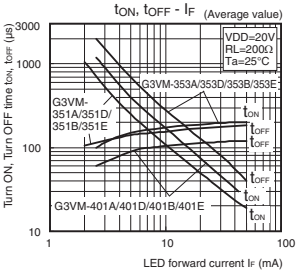
■Engineering Data

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

G3VM-61A1/61D1/61B1/61E1

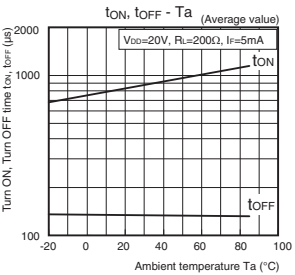


G3VM-351A/351D/351B/351E
G3VM-353A/353D/353B/353E
G3VM-401A/401D/401B/401E

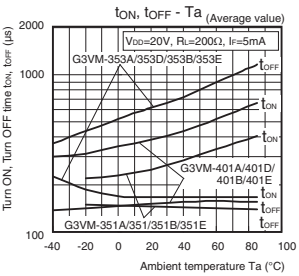


● Turn ON, Turn OFF time vs. Ambient temperature

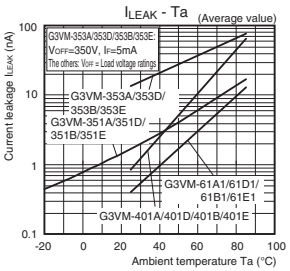
G3VM-61A1/61D1/61B1/61E1



G3VM-351A/351D/351B/351E
G3VM-353A/353D/353B/353E
G3VM-401A/401D/401B/401E



● Current leakage vs. Ambient temperature

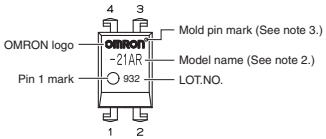


■Appearance / Terminal Arrangement / Internal Connections

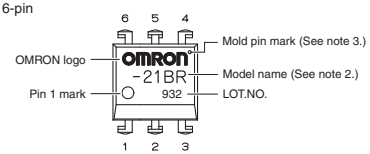
●Appearance

DIP (Dual Inline Package)

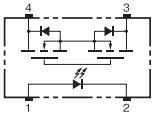
DIP 4-pin

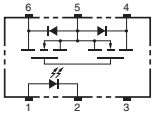


DIP 6-pin



●Terminal Arrangement/Internal Connections (Top View)





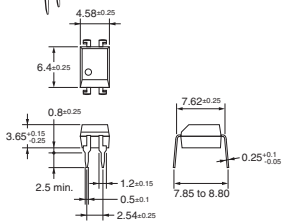
Note: 1. The actual product is marked differently from the image shown here.
Note: 2. "G3VM" does not appear in the model number on the Relay.
Note: 3. The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

■Dimensions (Unit: mm)

DIP4

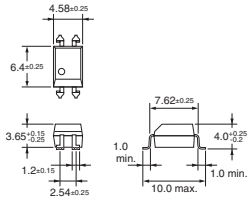
PCB Terminals

Weight: 0.25 g

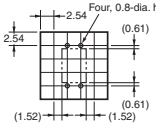


Surface-mounting Terminals

Weight: 0.25 g

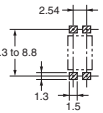


PCB Dimensions (BOTTOM VIEW)



Actual Mounting Pad Dimensions

(Recommended Value, Top View)

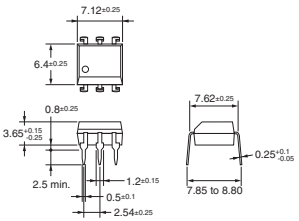


Note: The actual product is marked differently from the image shown here.

DIP6

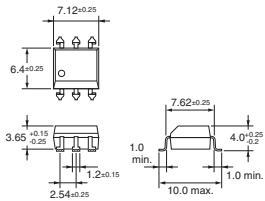
PCB Terminals

Weight: 0.4 g

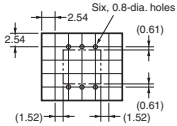


Surface-mounting Terminals

Weight: 0.4 g

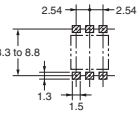


PCB Dimensions (BOTTOM VIEW)



Actual Mounting Pad Dimensions

(Recommended Value, Top View)



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

■Approved Standards

UL recognized

Model				Approved Standards	Contact form	File No.
G3VM-61A1 G3VM-351A G3VM-401A	G3VM-61D1 G3VM-351D G3VM-401D	G3VM-61B1 G3VM-351B G3VM-401B	G3VM-61E1 G3VM-351E G3VM-401E	UL (recognized)	1a (SPST-NO)	E80555
G3VM-353A	G3VM-353D	G3VM-353B	G3VM-353E		1b (SPST-NC)	

Models Certified by BSI for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-351A G3VM-351D	EN 60950/EN 60065 (BSI certified)	1a (SPST-NO)	8816 8817

■Safety Precautions

• Refer to the *Common Precautions for All MOS FET Relays* for precautions that apply to all MOS FET Relays.