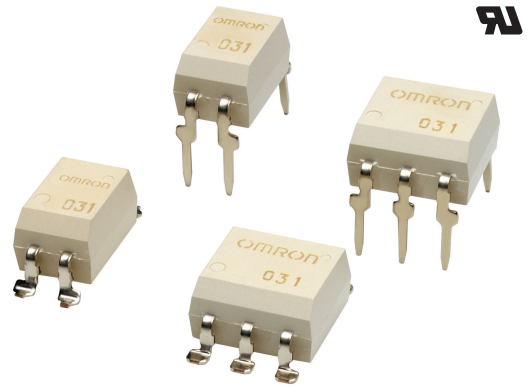


# G3VM-□A□/□D□/□B□/□E□

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

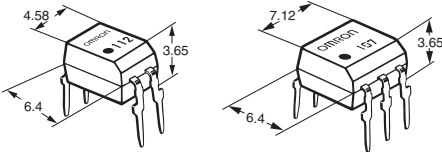
### Package

(Unit : mm, Average)

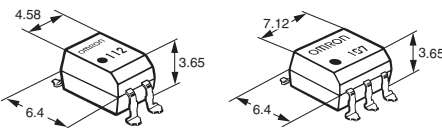
DIP 4-pin

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			
DIP4	1a (SPST-NO)	60 V	500 mA	G3VM-61A1	G3VM-61D1	100 pcs.	G3VM-61D1(TR)	1,500 pcs.
				G3VM-351A	G3VM-351D		G3VM-351D(TR)	
	1b (SPST-NC)	350 V	150 mA	G3VM-353A	G3VM-353D		G3VM-353D(TR)	
				G3VM-401A	G3VM-401D		G3VM-401D(TR)	

Package	Contact form	Load voltage (peak value) *	Continuous load current (peak value) *		Stick packaging			Tape packaging	
			Connection A, B	Connection C	Model		Minimum package quantity	Model	Minimum package quantity
					PCB 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.
					G3VM-351B	G3VM-351E		G3VM-351E(TR)	
	1b (SPST-NC)	350 V	150 mA	300 mA	G3VM-353B	G3VM-353E		G3VM-353E(TR)	
					G3VM-401B	G3VM-401E		G3VM-401E(TR)	

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

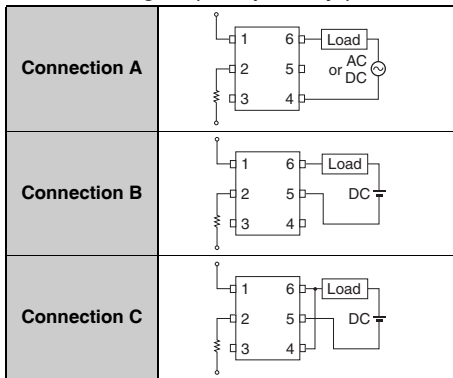
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

### ■ Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	G3VM-61A1	G3VM-61B1	G3VM-351A	G3VM-351B	G3VM-353A	G3VM-353B	G3VM-401A	G3VM-401B	Unit	Measurement conditions	
		G3VM-61D1	G3VM-61E1	G3VM-351D	G3VM-351E	G3VM-353D	G3VM-353E	G3VM-401D	G3VM-401E			
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)	V <sub>OFF</sub>		60	350			400		V		
	Continuous load current (AC peak/DC)	Connection A	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	-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	lop		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 *	V <sub>I-O</sub>		2,500								V <sub>rms</sub>	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

\* 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.

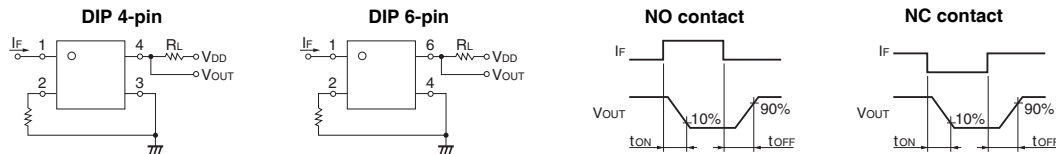
#### Connection Diagram (DIP 6-pin Relays)



## Electrical Characteristics (Ta = 25°C)

Item	Symbol	G3VM-61A1		G3VM-61B1		G3VM-351A		G3VM-351B		G3VM-353A		G3VM-353B		G3VM-401A		G3VM-401B		Unit	Measurement conditions
		G3VM-61D1	G3VM-61E1	G3VM-351D	G3VM-351E	G3VM-353D	G3VM-353E	G3VM-401D	G3VM-401E										
LED forward voltage	V <sub>F</sub>	Minimum								1.0								V	I <sub>F</sub> =10 mA
		Typical								1.15									
		Maximum								1.3									
Reverse current	I <sub>R</sub>	Maximum								10								μA	V <sub>R</sub> =5 V
Capacitance between terminals	C <sub>T</sub>	Typical								30								pF	V=0, f=1 MHz
Trigger LED forward current	I <sub>FT</sub> (I <sub>FC</sub> ) *2	Typical		1.6						1								mA	G3VM-353A/353D/353B/353E : I <sub>OFF</sub> =10 μA Others : I <sub>o</sub> =Continuous load current ratings
		Maximum								3									
Release LED forward current	I <sub>FC</sub> (I <sub>FT</sub> ) *2	Minimum								0.1								mA	G3VM-353A/353D/353B/353E : I <sub>o</sub> =150 mA Others : I <sub>OFF</sub> =100 μA
Maximum resistance with output ON	R <sub>ON</sub>	Typical	Connection A	1		35 (25)		15		18		17		Ω	G3VM-61A1/61D1/61B1/61E1/351A/351D/351B/351E/401A/401D/401B/401E : I <sub>F</sub> =5 mA, I <sub>o</sub> =Continuous load current ratings Values in parentheses are for t < 1 s. G3VM-353A/353D/353B/353E : I <sub>o</sub> =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	I <sub>LEAK</sub>	Maximum								1						μA	G3VM-353A/353D/353B/353E : I <sub>F</sub> =5 mA, V <sub>OFF</sub> =Load voltage ratings Others : V <sub>OFF</sub> =Load voltage ratings		
Capacitance between terminals	C <sub>OFF</sub>	Typical		130		30		85		40				pF	V=0, f=1 MHz				
Capacitance between I/O terminals	C <sub>I-O</sub>	Typical								0.8				pF	f=1 MHz, V <sub>s</sub> =0 V				
Insulation resistance between I/O terminals	R <sub>I-O</sub>	Minimum								1000				MΩ	V <sub>I-O</sub> =500 VDC, R <sub>oH</sub> ≤60%				
		Typical								10 <sup>8</sup>									
Turn-ON time	t <sub>ON</sub>	Typical		0.8		0.3		0.1		-		0.3		ms	I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω, V <sub>DD</sub> =10 V *1				
		Maximum		2				1											
Turn-OFF time	t <sub>OFF</sub>	Typical		0.1				1		-		0.1							
		Maximum		0.5		1		3		1									

\*1. Turn-ON and Turn-OFF Times



\*2. 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.

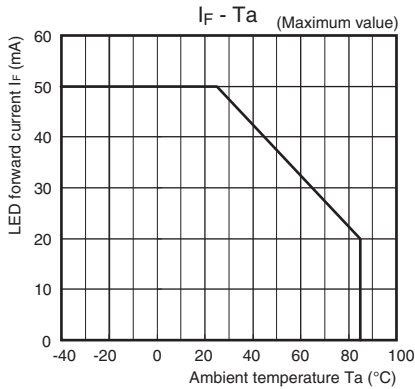
Item	Symbol	G3VM-61A1		G3VM-61B1		G3VM-351A		G3VM-351B		G3VM-353A		G3VM-353B		G3VM-401A		G3VM-401B		Unit
		G3VM-61D1	G3VM-61E1	G3VM-351D	G3VM-351E	G3VM-353D	G3VM-353E	G3VM-401D	G3VM-401E									
Load voltage (AC peak/DC)	V <sub>DD</sub>	Maximum		48				280						320				V
Operating LED forward current	I <sub>F</sub>	Minimum						5										mA
		Typical		7.5		10		-		7.5								
		Maximum						25										
Continuous load current (AC peak/DC)	I <sub>o</sub>	Maximum		500		100		150		100		120						
Ambient operating temperature	T <sub>a</sub>	Minimum						-20										°C
		Maximum						65										

## ■ Spacing and Insulation

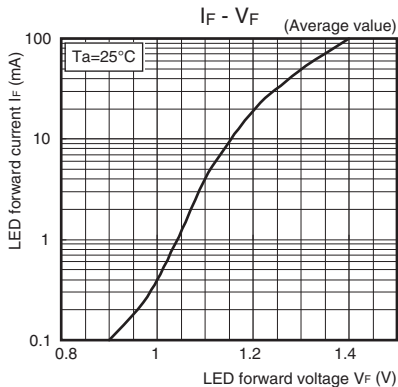
Item	Minimum	Unit
Creepage distances	7.0	mm
Clearance distances	7.0	
Internal isolation thickness	0.4	

## ■ Engineering Data

### ● LED forward current vs. Ambient temperature

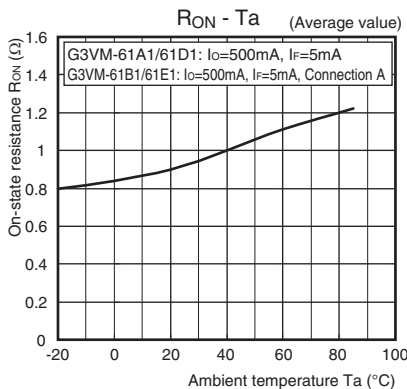


### ● LED forward current vs. LED forward voltage



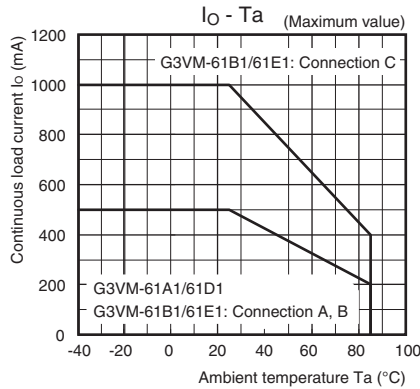
### ● On-state resistance vs. Ambient temperature

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



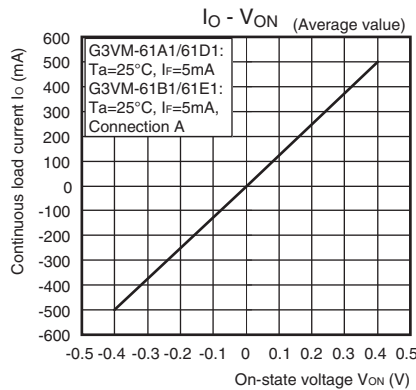
### ● Continuous load current vs. Ambient temperature

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

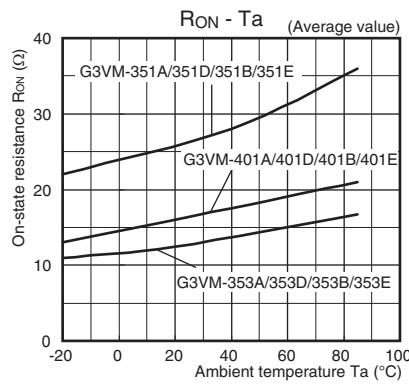


### ● Continuous load current vs. On-state voltage

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

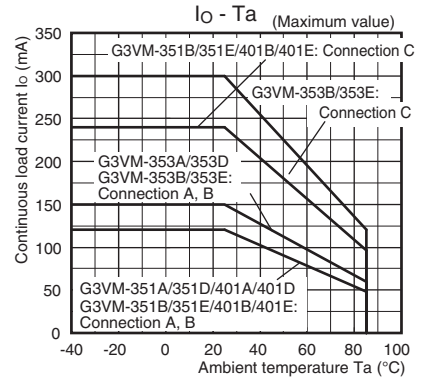


### G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E

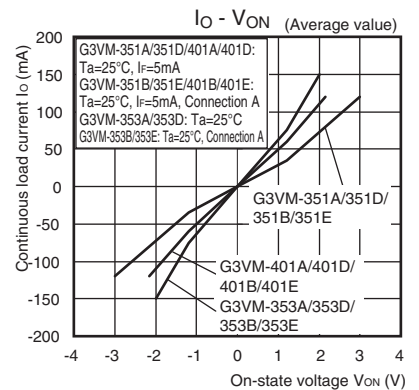


G3VM-351A/351D/401A/401D:  
 $I_o=120\text{mA}$ ,  $I_f=5\text{mA}$ ,  $t<1\text{s}$   
G3VM-351B/351E/401B/401E:  
 $I_o=120\text{mA}$ ,  $I_f=5\text{mA}$ ,  $t<1\text{s}$ , Connection A  
G3VM-353A/353D:  $I_o=150\text{mA}$ ,  $t<1\text{s}$   
G3VM-353B/353E:  $I_o=150\text{mA}$ ,  $t<1\text{s}$ , Connection A

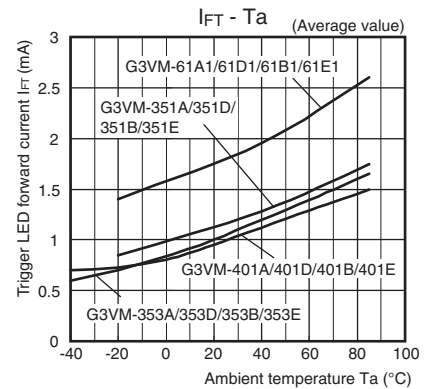
### G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E



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



### ● Trigger LED forward current vs. Ambient temperature

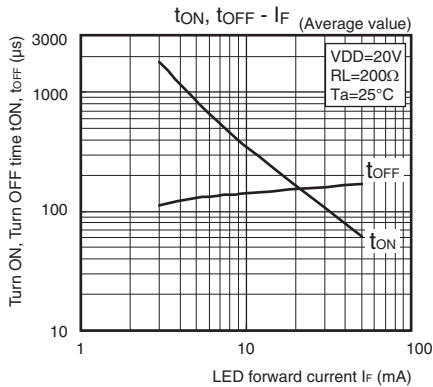


G3VM-61A1/61D1/351A/351D/401A/401D:  
 $I_o=\text{Continuous Load Current Ratings}$ ,  $t<1\text{s}$   
G3VM-61B1/61E1/351B/351E/401B/401E:  
 $I_o=\text{Continuous Load Current Ratings}$ ,  $t<1\text{s}$ , Connection A  
G3VM-353A/353D:  $I_{OFF}=10\mu\text{A}$   
G3VM-353B/353E:  $I_{OFF}=10\mu\text{A}$ , Connection A

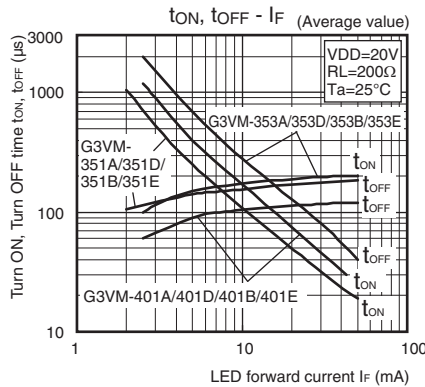
## Engineering Data

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

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

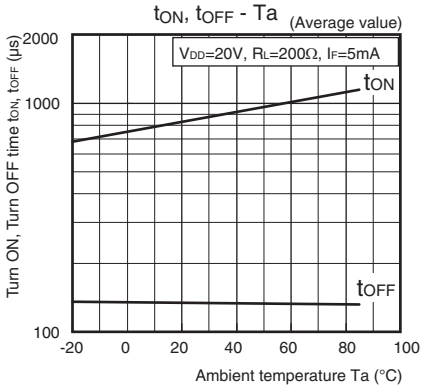


### G3VM-351A/351D/351B/351E G3VM-353A/353D/353B/353E G3VM-401A/401D/401B/401E

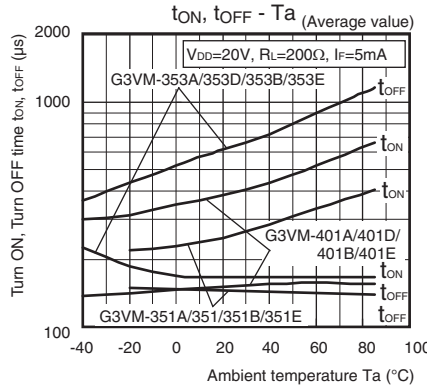


### ● Turn ON, Turn OFF time vs. Ambient temperature

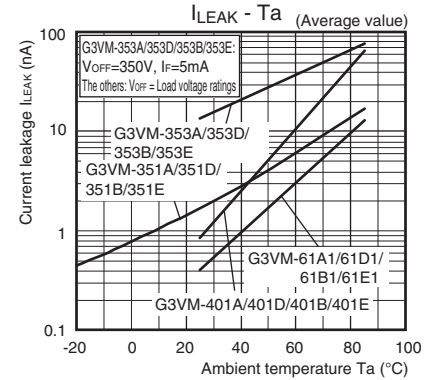
G3VM-61A1/61D1/61B1/61E1



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



### ● Current leakage vs. Ambient temperature

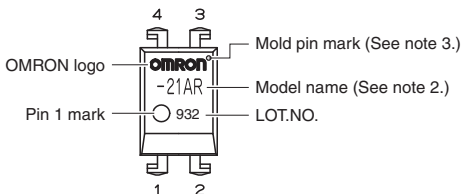


## Appearance / Terminal Arrangement / Internal Connections

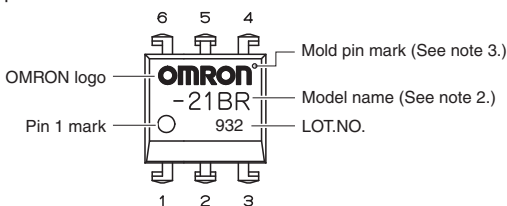
### ● Appearance

#### DIP (Dual Inline Package)

DIP 4-pin

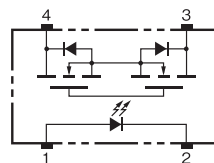


DIP 6-pin

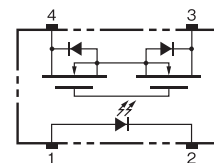


### ● Terminal Arrangement/Internal Connections (Top View)

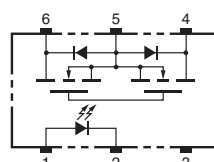
G3VM-61A1/61D1/401A/401D



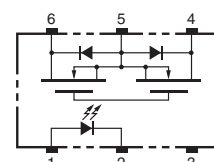
G3VM-353A/353D



G3VM-61B1/61E1/401B/401E



G3VM-353B/353E



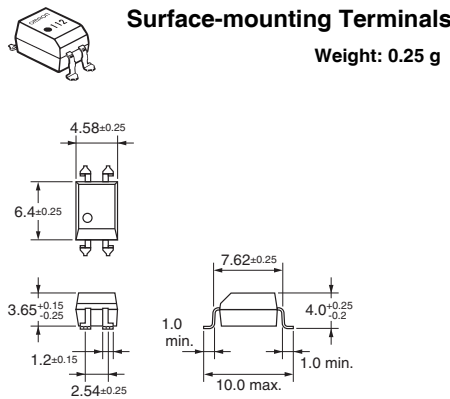
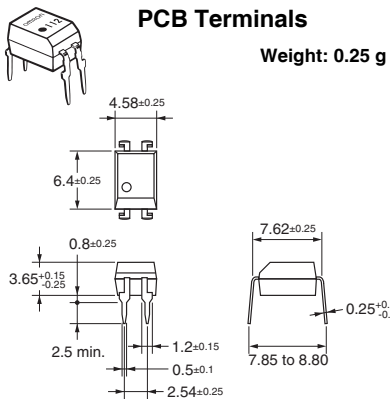
**Note: 1.** The actual product is marked differently from the image shown here.

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

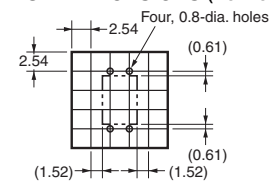
**Note: 3.** The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

## ■Dimensions (Unit: mm)

### DIP4

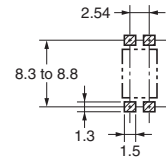


**PCB Dimensions (BOTTOM VIEW)**



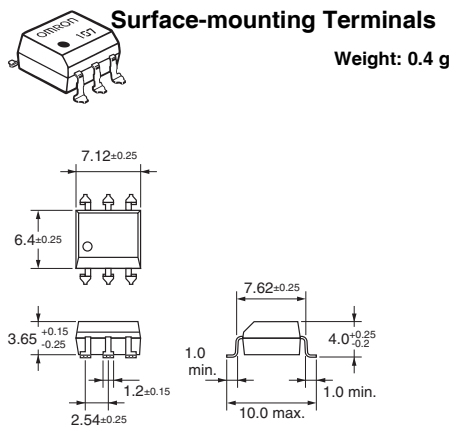
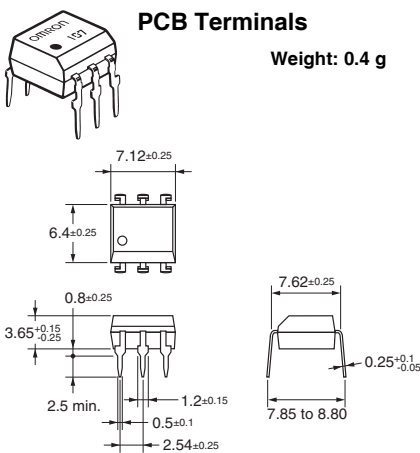
**Actual Mounting Pad Dimensions**

(Recommended Value, Top View)

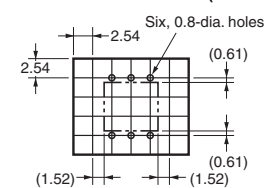


**Note:** The actual product is marked differently from the image shown here.

### DIP6

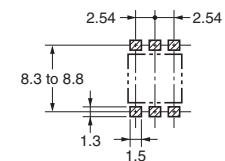


**PCB Dimensions (BOTTOM VIEW)**



**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-61D1	G3VM-61B1	G3VM-61E1	UL (recognized)	1a (SPST-NO)	E80555
G3VM-351A	G3VM-351D	G3VM-351B	G3VM-351E			
G3VM-401A	G3VM-401D	G3VM-401B	G3VM-401E		1b (SPST-NC)	
G3VM-353A	G3VM-353D	G3VM-353B	G3VM-353E			

Models Certified by SEMKO for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-351A G3VM-351D	EN62368-1 (SEMKO certified)	1a (SPST-NO)	SE-S-2001018

## ■Safety Precautions

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

DIP

G3VM-□A□/□D□/□B□/□E□

Please check each region's Terms & Conditions by region website.

## OMRON Corporation

Electronic and Mechanical Components Company

### Regional Contact

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