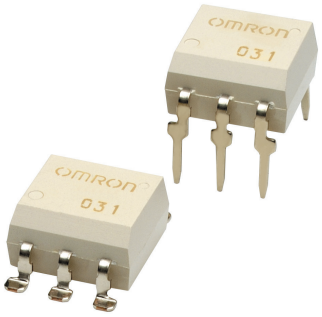
G3VM-□1BR□/□1ER□

MOSFET Relays DIP 6-pin, High-current and Low-ON-resistance Type

MOSFET Relays in DIP 6-pin packages that achieve the low ON resistance and high switching capacity of a mechanical relay

- **Load voltage: 20 V, 30 V, 40 V, 60 V, or 100 V**
- **20-V Relay: Continuous load current of 4 A (8 A) max. ✻**
- **30-V Relay: Continuous load current of 5 A (10 A) max. ✻**
- **40-V Relay: Continuous load current of 3.5 A (7 A) max. ✻**
- **60-V Relay: Continuous load current of 4 A (8 A) max. ✻**
- **100-V Relay: Continuous load current of 3.5 A (7 A) max. ✻**

✻ Values in parentheses are for connection C.



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

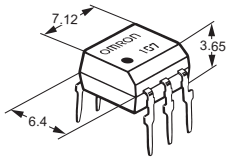
■Application Examples

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

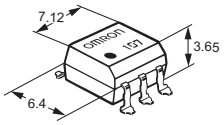
■Package (Unit : mm, Average)

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 5

1. Load Voltage
3 : 30 V
6 : 60 V
10 : 100 V

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

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

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	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)	30 V	5 A	10 A	G3VM-31BR	G3VM-31ER	50 pcs.	G3VM-31ER(TR05)	500 pcs.
		60 V	4 A	8 A	G3VM-61BR2	G3VM-61ER2		G3VM-61ER2(TR05)	
		100 V	3.5 A	7 A	G3VM-101BR1	G3VM-101ER1		G3VM-101ER1(TR05)	

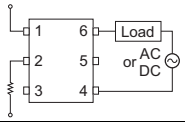
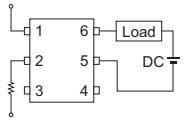
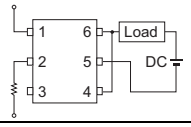
✻ The AC peak and DC value are given for the load voltage and continuous load current.
Note: 1. To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.

■Absolute Maximum Ratings (Ta = 25°C)

Item			Symbol	G3VM-31BR G3VM-31ER	G3VM-61BR2 G3VM-61ER2	G3VM-101BR1 G3VM-101ER1	Unit	Measurement conditions
Input	LED forward current		I_F	30			mA	
	Repetitive peak LED forward current		I_{FP}	1			A	100 μs pulses, 100 pps
	LED forward current reduction rate		ΔI_F/°C	-0.3			mA/°C	Ta ≥ 25°C
	LED reverse voltage		V_R	6			V	
	Connection temperature		T_J	125			°C	
Output	Load voltage (AC peak/DC)		V_{OFF}	30	60	100	V	
	Continuous load current	Connection A	I_O	5	4	3.5	A	Connection A: AC peak/DC Connection B and C: DC
		Connection B						
		Connection C		10	8	7		
	ON current reduction rate	Connection A	ΔI_O/°C	-50	-40	-35	mA/°C	Ta ≥ 25°C
		Connection B						
		Connection C		-100	-80	-70		
	Pulse ON current		Iop	15	12	10.5	A	t=100 ms, Duty=1/10
	Connection temperature		T_J	125			°C	
Dielectric strength between I/O ✻			V_{I-O}	2,500			Vrms	AC for 1 min
Ambient operating temperature			Ta	-40 to +110			°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.

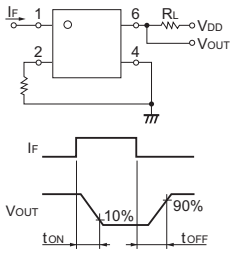
Connection Diagram

Connection A	
Connection B	
Connection C	

■ Electrical Characteristics (Ta = 25°C)

Item			Symbol		G3VM-31BR G3VM-31ER	G3VM-61BR2 G3VM-61ER2	G3VM-101BR1 G3VM-101ER1	Unit	Measurement conditions
Input	LED forward voltage		V_F	Minimum	1.5			V	I_F=10 mA
				Typical	1.64				
				Maximum	1.8				
	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	0.2	0.3	0.2	mA	I_O=1 A
				Maximum	3				
	Release LED forward current		I_{FC}	Minimum	0.01			mA	I_{OFF}=10 μA
Output	Maximum resistance with output ON	Connection A	R_{ON}	Typical	20	35	50	mΩ	G3VM-31BR/31ER/61BR2/ 61ER2/101BR1/101ER1: I_F=5 mA Io=3 A t < 1s
				Maximum	40	60	80		
		Connection B		Typical	10	18	24		G3VM-31BR/31ER: I_F=5 mA, Io=5 A, t < 1s G3VM-61BR2/61ER2: I_F=5 mA, Io=4 A, t < 1s G3VM-101BR1/101ER1: I_F=5 mA, Io=3.5 A, t < 1s
		Connection C		Typical	5	9	12		G3VM-31BR/31ER: I_F=5 mA, Io=10 A, t < 1s G3VM-61BR2/61ER2: I_F=5 mA, Io=8 A, t < 1s G3VM-101BR1/101ER1: I_F=5 mA, Io=7 A, t < 1s
	Current leakage when the relay is open		I_{LEAK}	Typical	0.01			μA	V_{OFF}=Load voltage ratings
				Maximum	1				
	Capacitance between terminals		C_{OFF}	Typical	1,100	640	450	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	1,000			MΩ	V_{I-O}=500 VDC, RoH ≤ 60%
				Typical	10^8				
Turn-ON time			t_{ON}	Typical	0.8	1.2	0.8	ms	I_F=5 mA, R_L=200 Ω, V_{DD}=20 V ✻
				Maximum	5				
Turn-OFF time			t_{OFF}	Typical	0.1				
				Maximum	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.

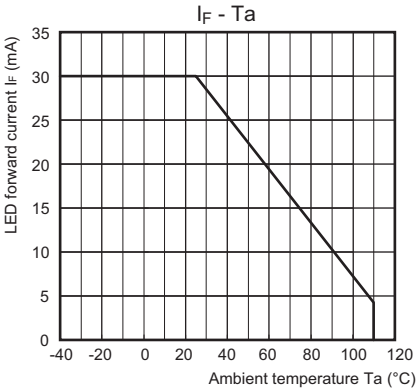
Item	Symbol		G3VM-31BR G3VM-31ER	G3VM-61BR2 G3VM-61ER2	G3VM-101BR1 G3VM-101ER1	Unit
Load voltage (AC peak/DC)	V_{DD}	Maximum	24	48	80	V
Operating LED forward current	I_F	Minimum	5			mA
		Typical	10			
		Maximum	25			
Continuous load current (AC peak/DC)	I_O	Maximum	5	4	3.5	A
Ambient operating temperature	Ta	Minimum	-40			°C
		Maximum	85			

■Spacing and Insulation

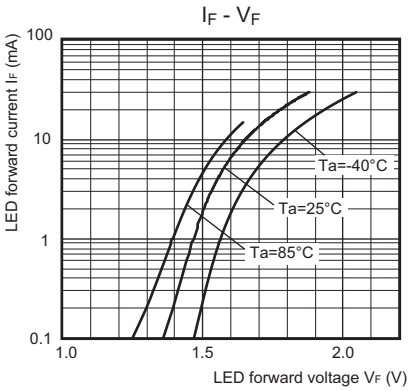
Item	Minimum	Unit
Creepage distances	7.0	mm
Clearance distances	7.0	
Internal isolation thickness	0.4	

■Engineering Data

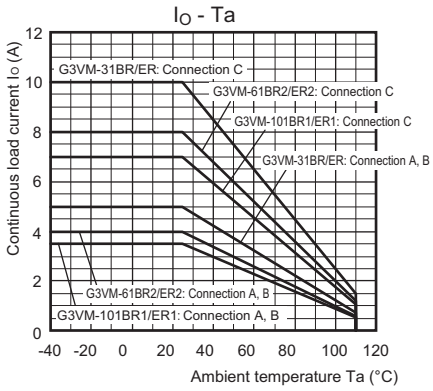
● **LED forward current vs. Ambient temperature**



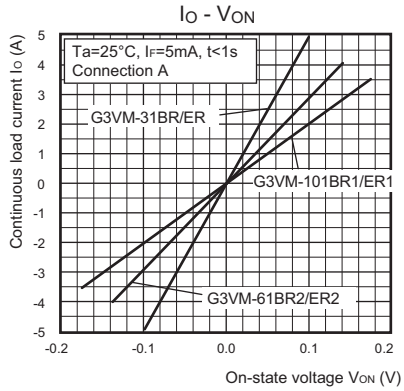
● **LED forward current vs. LED forward voltage**



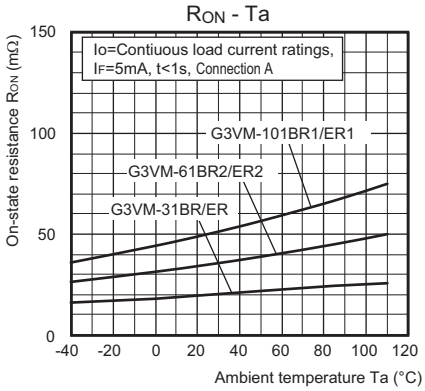
● **Continuous load current vs. Ambient temperature**



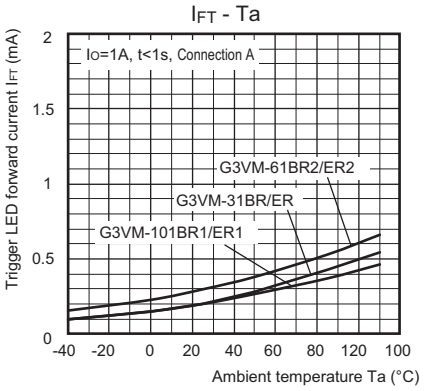
● **Continuous load current vs. On-state voltage**



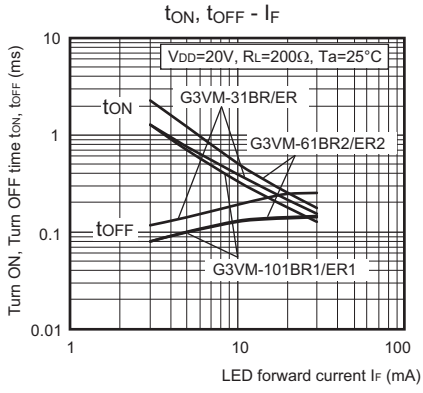
● **On-state resistance vs. Ambient temperature**



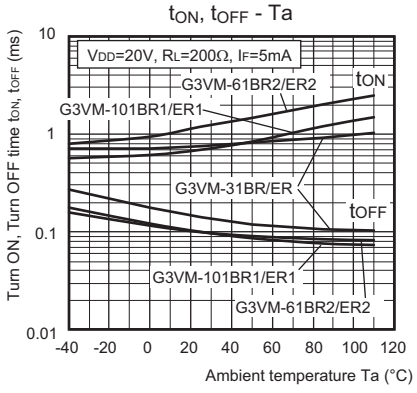
● **Trigger LED forward current vs. Ambient temperature**



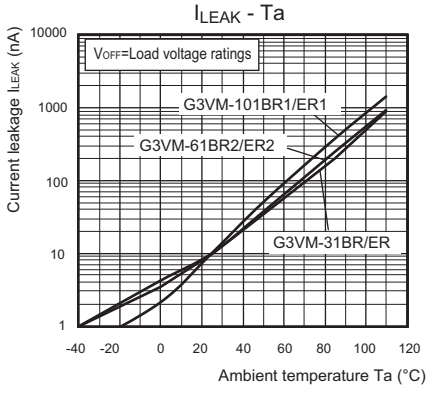
● **Turn ON, Turn OFF time vs. LED forward current**



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



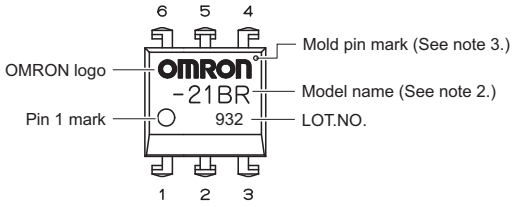
● **Current leakage vs. Ambient temperature**



■Appearance / Terminal Arrangement / Internal Connections

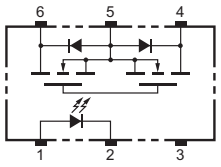
●Appearance

DIP (Dual Inline Package)
DIP 6-pin
G3VM-31BR/ER, -61BR2/ER2, -101BR1/ER1



●Terminal Arrangement/Internal Connections (Top View)

G3VM-31BR/ER, -61BR2/ER2, -101BR1/ER1



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

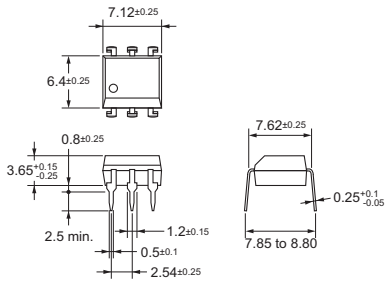
CAD Data marked products, 2D drawings and 3D CAD models are available.
For CAD information, please visit our website, which is noted on the last page.

(Unit: mm)

G3VM-31BR/61BR2/101BR1

PCB Terminals

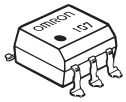
Weight: 0.4 g

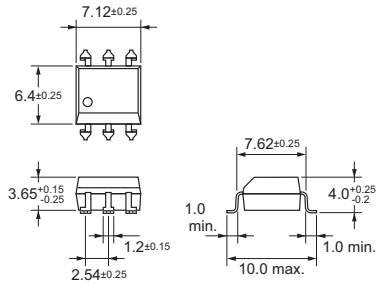


G3VM-31ER/61ER2/101ER1

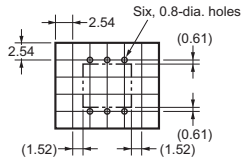
Surface-mounting Terminals

Weight: 0.4 g

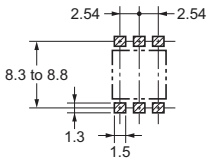




PCB Dimensions (BOTTOM VIEW)



Actual Mounting Pad Dimensions
(Recommended Value, Top View)



CAD Data

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 MOSFET Relays* (www.fa.omron.co.jp/) for precautions that apply to all MOSFET Relays.

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

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