

Introduction
General-purpose
High-voltage
Multi-voltage
(2A, 2A, and 1A)
High-current and
Low-ON-resistance
Small and high-
integrated strength
High-electric-
strength
Current-limiting
Low-voltage-capacitance
and low-ON-resistance
Small and high-
integrated strength
Standard models with
certification

G3VM-□□HR

MOS FET Relays SOP 6-pin, High-current and Low-ON-resistance Type

MOS FET Relays in SOP 6-pin packages that achieve the low ON resistance and high switching capacitance of a mechanical relay

- Load voltage: 20 V, 40 V, 60 V, 80 V, or 100 V
- 20-V Relay: Continuous load current of 2.5 A (5 A) max.*
- 40-V Relay: Continuous load current of 2.5 A (5 A) max.*
- 60-V Relay: Continuous load current of 2.3 A (4.6 A) max.*
- 80-V Relay: Continuous load current of 1.25 A (2.5 A) max.*
- 100-V Relay: Continuous load current of 1.4 A (2.8 A) max.*

* Values in parentheses are for connection C.

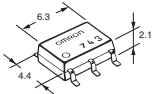
RoHS Compliant

Application Examples

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

Package (Unit : mm, Average)

SOP 6-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
2 : 20 V
4 : 40 V
6 : 60 V
8 : 80 V
10 : 100 V
2. Contact form
1 : 1a (SPST-NO)
3. Package
H : SOP 6-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) *		Stick packaging		Tape packaging	
				Connection A, B	Connection C	Model	Minimum package quantity	Model	Minimum package quantity
SOP6	1a (SPST-NO)	Surface-mounting Terminals	20 V	2.5 A	5 A	G3VM-21HR	75 pcs.	G3VM-21HR(TR)	2,500 pcs.
			40 V			G3VM-41HR		G3VM-41HR(TR)	
			60 V	2.3 A	4.6 A	G3VM-61HR		G3VM-61HR(TR)	
			80 V	1.25 A	2.5 A	G3VM-81HR		G3VM-81HR(TR)	
			100 V	1.4 A	2.8 A	G3VM-101HR		G3VM-101HR(TR)	

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

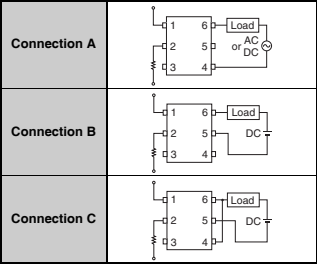
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR)" to the end of the model number.

■Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	G3VM-21HR	G3VM-41HR	G3VM-61HR	G3VM-81HR	G3VM-101HR	Unit	Measurement conditions
Input	LED forward current	IF	30			50	30	mA	
	LED forward current reduction rate	$\Delta I_F/\text{°C}$	-0.3			-0.5	-0.3	mA/°C	Ta ≥ 25°C
	LED reverse voltage	VR	5						V
	Connection temperature	TJ	125						°C
Output	Load voltage (AC peak/DC)	VOFF	20	40	60	80	100	V	
	Continuous load current	Connection A	2500			1250	1400	mA	Connection A: AC peak/DC Connection B and C: DC
		Connection B	5000			2500	2800		
	ON current reduction rate	Connection A	-33.3			-12.5	-18.7	mA/°C	G3VM-81HR : Ta ≥ 25°C Others : Ta ≥ 50°C
		Connection B	-66.6			-25.0	-37.3		
		Connection C	-66.7			-61.3	-73.3		
	Pulse ON current	lop	7.5			3.75	4	A	t=100 ms, Duty=1/10
	Connection temperature	TJ	125						°C
Dielectric strength between I/O (See note 1.)		VI-O	1500						Vrms AC for 1 min
Ambient operating temperature		Ta	-40 to +85			-20 to +85	-40 to +85	°C	With no icing or condensation
Ambient storage temperature		Tstg	-55 to +125			-40 to +125	-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



Introduction

General purpose

High-side-voltage

Multi-channel-relay (2A, 2A, and 1A)

High-current and Low-On-resistance

Small and high-impedance strength

High-impedance strength

Current-limiting

Low-voltage-capacitive load-voltage

Small and high-impedance strength

Certified models with Standards certification

DIP

SOP

SSOP

USOP

VSON

G3VM-CHR

G3VM-□HR

MOS FET Relays

■Electrical Characteristics (Ta = 25°C)

Item

Symbol

G3VM-21HR

G3VM-41HR

G3VM-61HR

G3VM-81HR

G3VM-101HR

Unit

Measurement conditions

LED forward voltage

V_F

Minimum

1.18

1.33

1.15

1.33

V

I_F=10 mA

Reverse current

I_R

Maximum

1.48

1.3

1.48

μA

V_R=5 V

Capacitance between terminals

C_T

Typical

70

15

70

pF

V=0, f=1 MHz

Trigger LED forward current

I_{FT}

Typical

—

0.4

2

0.4

mA

G3VM-21HR/41HR/61HR/101HR : I_O=100 mA
G3VM-81HR : I_O=1250 mA

Release LED forward current

I_{FC}

Minimum

0.1

0.2

0.1

mA

I_{OFF}=10 μA

Maximum resistance with output ON

Connection A

Connection B

Connection C

Connection A

Connection B

Connection C

R_{ON}

Typical

0.02

0.03

0.04

0.11

0.1

Ω

G3VM-21HR/41HR/61HR : I_F=5 mA, I_O=2 A (A or B connections), t < 1 s
G3VM-81HR : I_F=5 mA, I_O=Continuous load current ratings
G3VM-101HR : I_F=5 mA, I_O=Continuous load current ratings, t < 1 s

Current leakage when the relay is open

I_{LEAK}

Typical

—

1.2

—

nA

G3VM-21HR/41HR/61HR/101HR : V_{OFF}=Load voltage ratings
G3VM-81HR : V_{OFF}=20 V, Ta=50°C

Capacitance between terminals

C_{OFF}

Typical

1000

460

1000

pF

G3VM-21HR/41HR/61HR/101HR : V=0, f=1 MHz
G3VM-81HR : V=0, f=100 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

10⁸

MΩ

V_{I-O}=500 VDC, RoH≤80%

Turn-ON time

t_{ON}

Typical

1.5

1.0

2.0

1.0

ms

G3VM-21HR : I_F=5 mA, R_L=200 Ω, V_{DD}=10 V (See note 2.)
G3VM-41HR/61HR/81HR/101HR : I_F=5 mA, R_L=200 Ω, V_{DD}=20 V (See note 2.)

Turn-OFF time

t_{OFF}

Typical

0.1

0.15

0.7

0.15

ms

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

1

6

4

I_F

R_L

V_{DD}

V_{OUT}

I_F

V_{OUT}

10%

90%

t_{ON}

t_{OFF}

■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-21HR

G3VM-41HR

G3VM-61HR

G3VM-81HR

G3VM-101HR

Unit

Load voltage (AC peak/DC)

V_{DD}

Maximum

20

40

60

64

100

V

Operating LED forward current

I_F

Minimum

5

10

7.5

—

7.5

mA

Continuous load current (AC peak/DC)

I_O

Maximum

2000

20

1800

1250

1100

mA

Ambient operating temperature

Ta

Minimum

—20

65

60

65

°C

■Spacing and Insulation

Item

Minimum

Unit

Creepage distances

4.0

mm

Clearance distances

4.0

mm

Internal isolation thickness

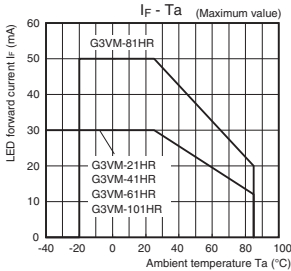
0.1

mm

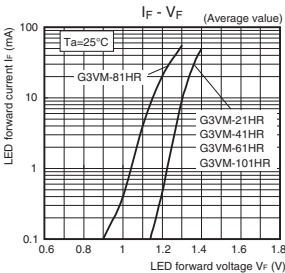
120

Engineering Data

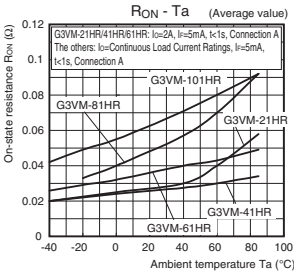
LED forward current vs. Ambient temperature



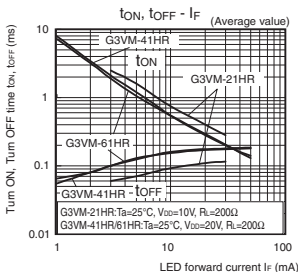
LED forward current vs. LED forward voltage



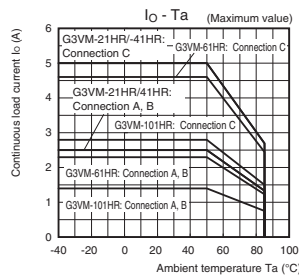
On-state resistance vs. Ambient temperature



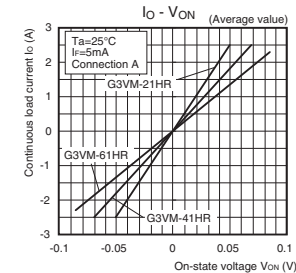
Turn ON, Turn OFF time vs. LED forward current



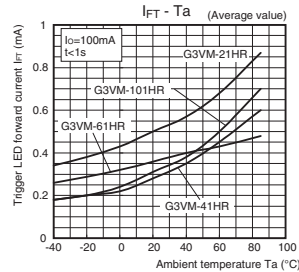
Continuous load current vs. Ambient temperature



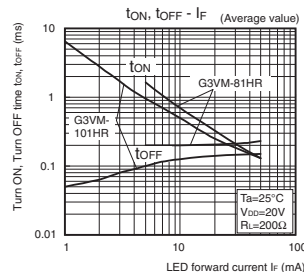
Continuous load current vs. On-state voltage



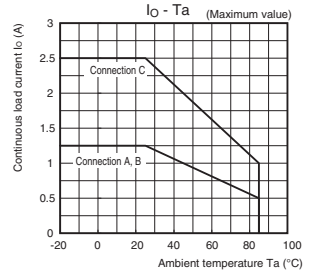
Trigger LED forward current vs. Ambient temperature



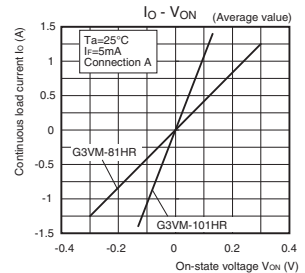
G3VM-81HR/101HR



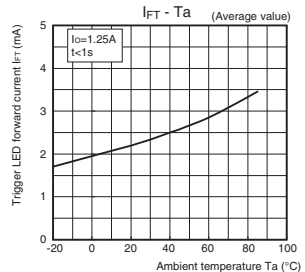
G3VM-81HR



G3VM-81HR/101HR



G3VM-81HR



G3VM- $\square$ HR

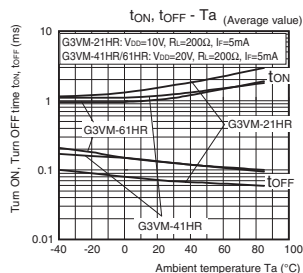
MOS FET Relays

Engineering Data

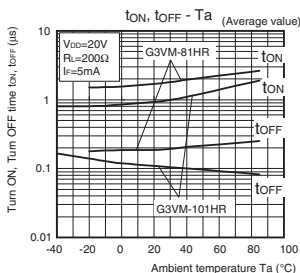
Turn ON, Turn OFF time vs.

Ambient temperature

G3VM-21HR/41HR/61HR

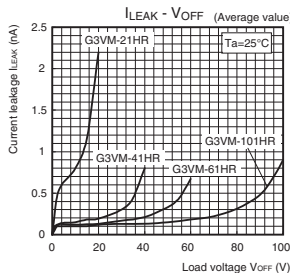


G3VM-81HR/101HR



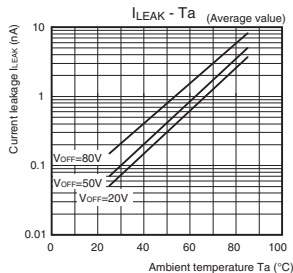
Current leakage vs. Load voltage

G3VM-21HR/41HR/61HR/101HR



Current leakage vs. Ambient temperature

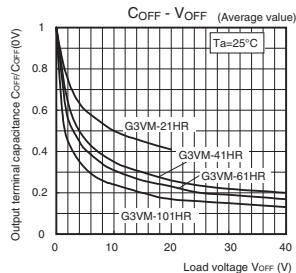
G3VM-81HR



Output terminal capacitance vs.

Load voltage

G3VM-21HR/41HR/61HR/101HR

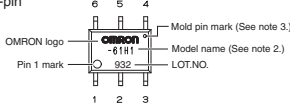


■Appearance / Terminal Arrangement / Internal Connections

●Appearance

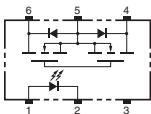
SOP (Small Outline Package)

SOP 6-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)

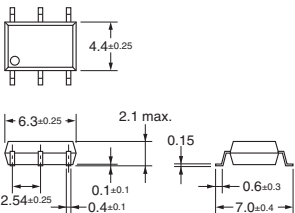


■Dimensions (Unit: mm)

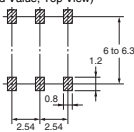


Surface-mounting Terminals

Weight: 0.13 g



Actual Mounting Pad Dimensions (Recommended Value, Top View)



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.