MOS FET Relays SOP 4-pin, General-purpose Type

General-purpose MOS FET Relays in SOP 4-pin packages for a wide range of applications

- Contact form: 1a (SPST-NO) or 1b (SPST-NC)
- Load voltage: 350 V or 400 V

RoHS Compliant

Application Examples

- Semiconductor test equipment
- Various battery-driven devices
- Security equipment

F

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

Test & Measurement equipment

Communication equipment

- Power circuit
 - Amusement equipment

Package SOP 4-pin

Special SOP 4-pin

Model Number Legend

G3VM-DDDD 1 2 3 4 5

ı 35 : 350 V)) 40:400 V ;)

4. Additional functions

None:Dielectric strength between I/O 1500 V Y:

Dielectric strength between I/O 3750 V

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.

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

Ordering Information

			Lond voltage Continuous		Stick p	backaging	Tape packaging			
Package	Contact form	Terminals	Load voltage (peak value) *	load current (peak value) *	Model	Minimum package quantity	Model	Minimum package quantity		
SOP4	4.5			100 mA	G3VM-351G1	100 pcs.	G3VM-351G1(TR)	2,500 pcs.		
Special SOP	1a (SPST-NO)		350 V	110 mA	G3VM-351VY	125 pcs.	G3VM-351VY(TR05)	500 pcs.		
4-PIN	(01 01 110)	Ounters					G3VM-351VY(TR)	3,000 pcs.		
	1b (SPST-NC)	Surface- mounting		120 mA	G3VM-353G		G3VM-353G(TR)			
SOP4		0	0	Terminals		100 mA	G3VM-401G1	100 pcs.	G3VM-401G1(TR)	2,500 pcs.
	1a (SPST-NO)		400 V	120 mA	G3VM-401G		G3VM-401G(TR)			
Special SOP 4-PIN			400 V	110mA	G3VM-401VY	125 pcs.	G3VM-401VY(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)", "(TR05)" to the end of the model number.

SO

VM-35_G_/351VY/401G_/401VY

 Industrial equipment (Unit:mm, Average)

1. Load Voltage

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



G3VM-35_G_/351VY/401G_/401VY

MOS FET Relays

■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-351G1	G3VM-351VY	G3VM-353G	G3VM-401G1	G3VM-401G	G3VM-401VY	Unit	Measurement conditions
	LED forward current	IF	50	30	50	30	50	30	mA	
Input	LED forward current reduction rate	∆IF/°C	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	mA/°C	Ta≥25°C
lnp	LED reverse voltage	VR	5	6		5		6	V	
	Connection temperature	TJ			1/	25		·	°C	
	Load voltage (AC peak/DC)	VOFF		350			400		V	
Ŧ	Continuous load current (AC peak/DC)	lo	100	110	120	100	120	110	mA	
Output	ON current reduction rate	∆lo/°C	-1.0	-1.1	-1.2	-1.0	-1.2	-1.1	mA/°C	Ta≥25°C
ō	Pulse ON current	Іор	300	330	360	300	360	330	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ		,	1/	25		•1	°C	
Die	Dielectric strength between I/O *		1500	3750		1500 3750		3750	Vrms	AC for 1 min
Am	nbient operating temperature	Та	-40 to +85	-40 to +110	110 -40 to +85 -40 to +110			°C	With no icing or	
Am	nbient storage temperature	Tstg			-55 tc	o +125			°C	condensation
So	oldering temperature	-			26	60			°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)

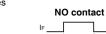
	Item	Symbol		G3VM- 351G1	G3VM- 351VY	G3VM- 353G	G3VM- 401G1	G3VM- 401G	G3VM- 401VY	Unit	Measurement conditions	
			Minimum	1.0	1.1	1.0	1.1	1.0	1.1			
	LED forward voltage	VF	Typical	1.15	1.27	1.15	1.27	1.15	1.27	V	IF=10 mA	
			Maximum	1.3	1.4	1.3	1.4	1.3	1.4			
	Reverse current	IR	Maximum			1	0			μA	Vr=5 V	
ŧ	Capacitance between terminals	Ст	Typical			3	0			pF	V=0, f=1 MHz	
Input	Trigger LED forward	IFT (IFC)	Typical	0.4	0.8	1	-	1	0.8	mA	G3VM-351G1/401G1 : lo=100 mA G3VM-351VY/401VY : lo=110 mA	
	current	(IFC) *2	Maximum	1	;	3	0.2	;	3	IIIA	G3VM-353G : loff=10 μA G3VM-401G : lo=120 mA	
	Release LED	IFC (IFT)	Minimum		0.1	1	-	0	.1	mA	G3VM-351G1/351VY/401G1/401G/ 401VY : IoFF=100 μA	
	torward current	*2	Typical	-	0.4	-	0.001	-	0.5		G3VM-353G : lo=120 mA	
	Maximum resistance	Ron	Typical	35 (25)	35 (22)	15	18	17	40 (30)	Ω	G3VM-351G1 : IF=2 mA, Io=100 mA Values in parentheses are for t < 1 s. G3VM-351VY/401VY: IF=5 mA, Io=110 mA	
Output	with output ON		Maximum	50	(35)	25	3	35	65 (45)	52	Values in parentheses are for t < 1 s. G3VM-353G : lo=120 mA G3VM-401G1 : l=0.5 mA, lo=100 mA, t < 1 s G3VM-401G : l=5 mA, lo=120 mA	
OUI	Current leakage when the relay is	ILEAK	Typical	1	1	-	1	-	1	nA	G3VM-351G1/351VY : Voff=350 V G3VM-353G : Voff=350 V, If=5 mA	
	open	ILEAK	Maximum			1,(000				G3VM-401G1/401G/401VY : VoFF=400 V	
	Capacitance between terminals	COFF	Typical	35	30	65	7	70		pF	G3VM-351G1/351VY/401G1/401G/ 401VY : V=0, f=1 MHz G3VM-353G : V=0, f=1 MHz, IF=5 mA	
	Capacitance between I/ O terminals CI-O Typical		Typical	0.8					pF	f=1 MHz, Vs=0 V		
Ins	sulation resistance	Ri-o	Minimum	1000						MΩ	V⊦o=500 VDC, RoH≤60%	
be	tween I/O terminals		Typical			1	08				vi-0=300 vDC, n0⊓≥00%	
Tu	rn-ON time	ton	Typical	1	0.5	-	2	0.3	0.5		G3VM-351G1 :	
			Maximum	5		1	10		1	ms	I⊧=2 mA, R∟=200 Ω, Vɒɒ=20 V G3VM-401G1 :	
Tu	rn-OFF time	toff	Typical	1	0.1	-	1	0	.1	1113	IF=0.5 mA, RL=200 Ω, VDD=20 V	
Tu		IUFF	Maximum	3	0.5	3	5	1	0.5		Others : IF=5 mA, RL=200 Ω , VDD=20 V *1	

*1. Turn-ON and Turn-OFF Times

 $\frac{1}{m}$

2

0



ton

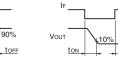
109

Vout

NC contact

90%

toff



*2. These values are for Relays with NC contacts

R∟ ₩VDD

Vout

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-351G1	G3VM-351VY	G3VM-353G	G3VM-401G1	G3VM-401G	G3VM-401VY	Unit	
Load voltage (AC peak/DC)	Vdd	Maximum		280		320			V	
		Minimum	-	5	5	-		5		
Operating LED forward current	IF	Typical	2	7.5	-	0.5	7	.5	1	
		Maximum	25						mA	
Continuous load current (AC peak/DC)	lo	Maximum	80	110	120	80	120	110		
Ambient operating temperature	Та	Minimum	-20					°C		
Ambient operating temperature	ia	Maximum	65	100	6	5		100		

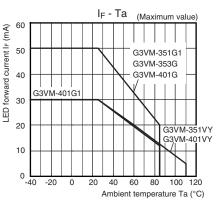
Spacing and Insulation

Itom	Item G3VM-35□G□/401G□ G3VM-351VY/401VY			
nem	Mini	Unit		
Creepage distances	4.0	5.0		
Clearance distances	4.0	5.0	mm	
Internal isolation thickness	0.1	0.2		

G3VM-35_G_/351VY/401G_/401VY

Engineering Data

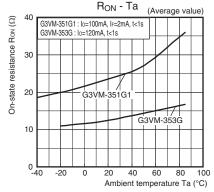
LED forward current vs. Ambient temperature



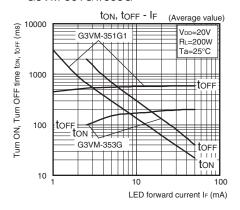
 Continuous load current vs. On-state voltage G3VM-351G1/353G

Io - Von (Average value) 150 Continuous load current lo (mA) G3VM-351G1 : Ta=25°C, IF=2mA G3VM-351G1 G3VM-353G : Ta=25°C 100 50 0 -50 -100 G3VM-353G -150 2 -3 -2 -1 0 1 3 On-state voltage Von (V)

On-state resistance vs. Ambient temperature G3VM-351G1/353G



Turn ON, Turn OFF time vs. LED forward current G3VM-351G1/353G



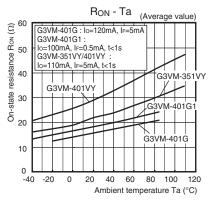
 Continuous load current vs. Ambient temperature

I_O - Ta (Maximum value) 1 current lo (mA) 100 G3VM-353G G3VM-401G Continuous load G3VM-351G1 G3VM-401G1 G3VM-351VY 50 G3VM-401VY 0 -20 40 60 80 100 0 20 120 -40 Ambient temperature Ta (°C)

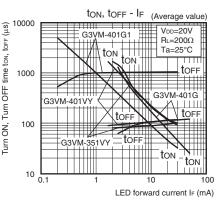
G3VM-351VY/401G/401G1/401VY

IO - VON (Average value) 150 (mA) G3VM-351VY G3VM-401G 0 100 G3VM-401G1 Continuous load current 50 G3VM-401VY 0 G3VM-401G/351VY : Ta=25°C, IF=5mA G3VM-401G1 : Ta=25°C, IF=1mA, t<1s G3VM-401VY : Ta=25°C, IF=5mA, t<1s -50 -100 -150 -3.5 -3 -2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 On-state voltage Von (V)

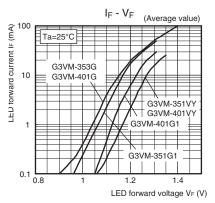
G3VM-351VY/401G/401G1/401VY



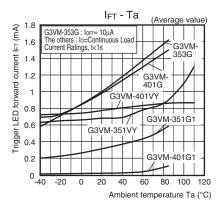
G3VM-351VY/401G/401G1/401VY



LED forward current vs. LED forward voltage



Trigger LED forward current vs.



Ambient temperature

MOS FET Relays

Engineering Data

• Turn ON, Turn OFF time vs. Ambient temperature G3VM-351G1/353G G3VM-351VY/401G/401G1/401VY ton, toff - Ta (Average value) t_{ON}, t_{OFF} - Ta (Average value) Turn ON, Turn OFF time ton, torr ($\mu s)$ 2000 5000 G3VM-351G1 : Vod=20V, RL=200Ω, IF=2mA ↓ ton Turn ON, Turn OFF time ton, toFF (µs) ton -G3VM-353G : VDD=20V, RL=200Ω, IF=5mA - toff G3VM-401G1 G3VM-351G1 1000 1000 ton 01VY ton ‡ton GSVM 401G tore torr G3VM-353G 100 ±torr TOFF E G3VM-351VY toff ton G3VM-351VY/401G/401VY : VDD=20V, RL=200Ω, IF=5mA 10 G3VM-401G1 : VbD=20V, RL=200Ω, IF=0.5mA ¹⁰⁰ -40 -20 0 20 40 60 80 100 -40 -20 0 20 40 60 80 100 120 Ambient temperature Ta (°C) Ambient temperature Ta (°C) • Current leakage vs. SOP Ambient temperature G3VM-351G1/353G/351VY/401G/ G3VM-401VY 401G1 I_{LEAK} - Ta I_{LEAK} - Ta (Average value) (Average value) 100 2 Current leakage ILEAK (nA) ILEAK (nA) G3VM-353G VOFF=400V 10 Current leakage I_L 5.1 5 G3VM-401G G3VM-351VY G3VM-G3VM-351G1 0.1 401G1 0.01 0.1

0.01

-40 -20 0

G3VM-353G : VOFF=350V, IF=5mA The others : VOFF=Load voltage ratings

60

80 100

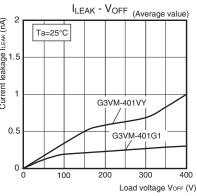
Ambient temperature Ta (°C)

120

100 120 20 40 60 80

Ambient temperature Ta (°C)





G3VM-35 G /351VY/401G /401VY

0.001

-40

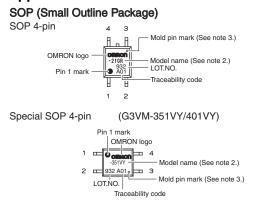
-20 0 20 40

5

G3VM-35_G_/351VY/401G_/401VY

Appearance / Terminal Arrangement / Internal Connections

Appearance

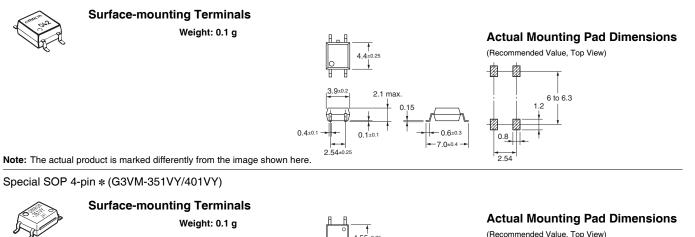


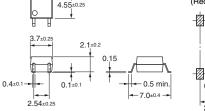
Note: 1. The actual product is marked differently from the image shown here. Note: 2. "G3VM" does not appear in the model number on the Relay.

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

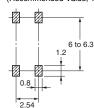
■Dimensions (Unit: mm)

SOP (Small Outline Package) SOP 4-pin





(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

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UL recognized	74		
Model	Approved Standards	Contact form	File No.
G3VM-351G1 G3VM-401G G3VM-351VY G3VM-401VY	UL (recognized)	1a (SPST-NO)	E80555
G3VM-353G		1b (SPST-NC)	

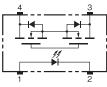
Models Certified by BSI for EN/IEC Standards

Model	Approved Standards	Contact form	File No.
G3VM-401G	EN62368-1 (BSI certified)	1a (SPST-NO)	VC669262

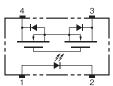
Terminal Arrangement/Internal Connections

(Top View)

G3VM-351G1/VY G3VM-401G1/G/VY







SOP

■Safety Precautions

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

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

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In the interest of product improvement, specifications are subject to change without notice.

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