

# G3VM-41LR

MOS FET Relays SSOP, Low-output-capacitance and Low-ON-resistance Type (with Low C × R)

## MOS FET Relays in SSOP packages that achieve a low C × R

- Load voltage : 40 V
- G3VM-41LR10 : Low C × R = 5.4 pF·Ω, C<sub>OFF</sub> (standard) = 0.45 pF, R<sub>ON</sub> (standard) = 12 Ω
- G3VM-41LR6 : Low C × R = 10 pF·Ω, C<sub>OFF</sub> (standard) = 1 pF, R<sub>ON</sub> (standard) = 10 Ω
- G3VM-41LR11 : Low C × R = 4.9 pF·Ω, C<sub>OFF</sub> (standard) = 0.7 pF, R<sub>ON</sub> (standard) = 7 Ω
- G3VM-41LR4 : Low C × R = 10 pF·Ω, C<sub>OFF</sub> (standard) = 5 pF, R<sub>ON</sub> (standard) = 2 Ω
- G3VM-41LR5 : Low C × R = 10 pF·Ω, C<sub>OFF</sub> (standard) = 10 pF, R<sub>ON</sub> (standard) = 1 Ω



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

RoHS Compliant

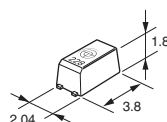
### Application Examples

- Semiconductor test equipment
- Communication equipment
- Test & Measurement equipment
- Data loggers

### Package

(Unit : mm, Average)

SSOP 4-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. Contact form    3. Package  
4 : 40 V            1 : 1a (SPST-NO)    L : SSOP 4-pin

4. Additional functions    5. Other informations  
R: Low ON resistance    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) *	Tape cut packaging		Tape packaging	
					Model	Minimum package quantity	Model	Minimum package quantity
SSOP4	1a (SPST-NO)	Surface-mounting Terminals	40 V	120 mA	G3VM-41LR10	1 pc.	G3VM-41LR10(TR05)	500 pcs.
				140 mA	G3VM-41LR6		G3VM-41LR6(TR05)	
				250 mA	G3VM-41LR11		G3VM-41LR11(TR05)	
				300 mA	G3VM-41LR4		G3VM-41LR4(TR05)	
					G3VM-41LR5		G3VM-41LR5(TR05)	

\* 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 "(TR05)" to the end of the model number.

Tape-cut SSOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

### Absolute Maximum Ratings (T<sub>a</sub> = 25°C)

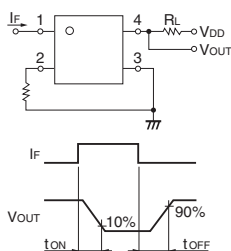
Item	Symbol	G3VM-41LR10	G3VM-41LR6	G3VM-41LR11	G3VM-41LR4	G3VM-41LR5	Unit	Measurement conditions
Input	LED forward current	I <sub>F</sub>	30	50	30	50	mA	
	LED forward current reduction rate	ΔI <sub>F</sub> /°C	-0.3	-0.5	-0.3	-0.5	mA/°C	T <sub>a</sub> ≥ 25°C
	LED reverse voltage	V <sub>R</sub>	5				V	
	Connection temperature	T <sub>J</sub>	125				°C	
Output	Load voltage (AC peak/DC)	V <sub>OFF</sub>	40				V	
	Continuous load current (AC peak/DC)	I <sub>O</sub>	120	140	250	300	mA	
	ON current reduction rate	ΔI <sub>O</sub> /°C	-1.2	-1.4	-2.5	-3.0	mA/°C	T <sub>a</sub> ≥ 25°C
	Pulse ON current	I <sub>OP</sub>	360	420	750	900	mA	t=100 ms, Duty=1/10
	Connection temperature	T <sub>J</sub>	125				°C	
	Dielectric strength between I/O *	V <sub>I-O</sub>	1500				Vrms	AC for 1 min
Ambient operating temperature	T <sub>a</sub>	-20 to +85				°C	With no icing or condensation	
Ambient storage temperature	T <sub>stg</sub>	-40 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.

## ■Electrical Characteristics (Ta = 25°C)

Item		Symbol	G3VM-41LR10	G3VM-41LR6	G3VM-41LR11	G3VM-41LR4	G3VM-41LR5	Unit	Measurement conditions
LED forward voltage	VF	Minimum	1.15	1.0	1.15	1.0		V	G3VM-41LR4/41LR5/41LR6 : IF=10 mA G3VM-41LR10/41LR11 : IF=5 mA
		Typical	1.35	1.15	1.3	1.15			
		Maximum	1.45	1.3	1.45	1.3			
Reverse current	IR	Maximum	10					μA	VR=5 V
Capacitance between terminals	CT	Typical	70	15	70	15		pF	V=0, f=1 MHz
Trigger LED forward current	IFT	Maximum	3	4	3	4		mA	Io=100 mA
Release LED forward current	IFC	Minimum	0.1	0.2	0.1	0.2		mA	G3VM-41LR4/41LR5/41LR6/41LR10 : IOFF=10 μA G3VM-41LR11 : IOFF=1 μA
Maximum resistance with output ON	RON	Typical	12	10	7	2	1	Ω	G3VM-41LR4/41LR5/41LR6 : IF=5 mA, Io=Continuous load current ratings, t=10 ms G3VM-41LR5/41LR10/41LR11 : IF=5 mA, Io=Continuous load current ratings, t<1 s
		Maximum	14	15	10	3	1.5		
Current leakage when the relay is open	ILEAK	Typical	0.01	–	0.01	–		nA	G3VM-41LR4/41LR5/41LR6: VOFF=30 V, Ta=50°C G3VM-41LR10/41LR11 : VOFF=35 V
		Maximum	0.2	1	0.2	1			
Capacitance between terminals	COFF	Typical	0.45	1	0.7	5	10	pF	V=0, f=100 MHz, t<1 s
		Maximum	0.8	2	1.3	7	14		
Capacitance between I/O terminals	CI-O	Typical	0.3	0.8	0.3	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 <sup>8</sup>						
Turn-ON time	ton	Typical	–	0.05	–	0.12	0.2	ms	IF=5 mA, RL=200 Ω, VDD=10 V *
		Maximum	0.2	0.5	0.2	0.5			
Turn-OFF time	toff	Typical	–	0.12	–	0.14	0.2	ms	IF=5 mA, RL=200 Ω, VDD=10 V *
		Maximum	0.3	0.5	0.2	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.

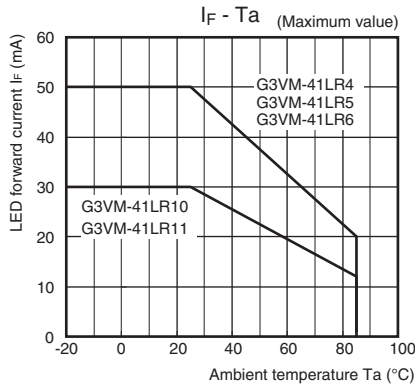
Item	Symbol		G3VM-41LR10	G3VM-41LR6	G3VM-41LR11	G3VM-41LR4	G3VM-41LR5	Unit
Load voltage (AC peak/DC)	VDD	Maximum	32					V
Operating LED forward current	IF	Minimum	–	10	–	10		mA
		Maximum	20	30	20	30		
Continuous load current (AC peak/DC)	Io	Maximum	120		140	250	300	
Ambient operating temperature	Ta	Minimum	-20					°C
		Maximum	60					

## ■Spacing and Insulation

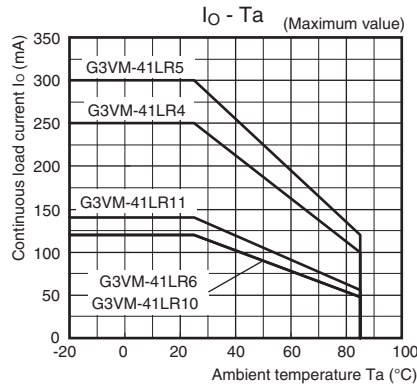
Item	Minimum	Unit
Creepage distances	2.5	mm
Clearance distances	2.5	
Internal isolation thickness	0.1	

## Engineering Data

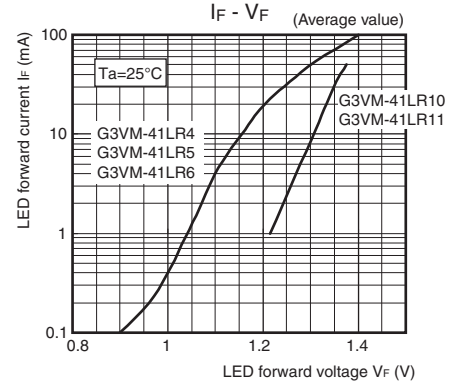
### LED forward current vs. Ambient temperature



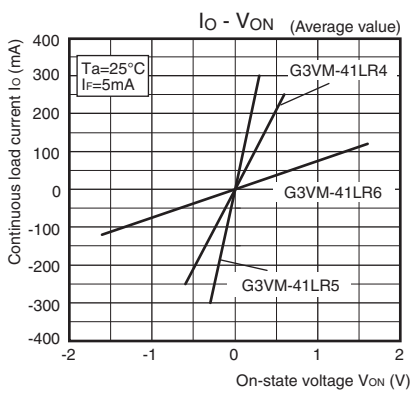
### Continuous load current vs. Ambient temperature



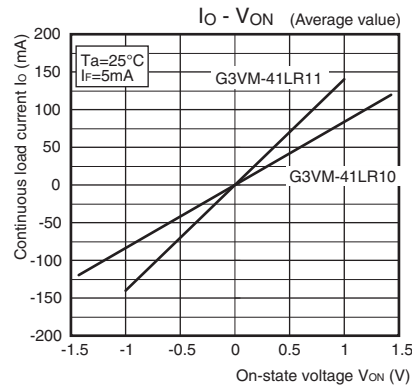
### LED forward current vs. LED forward voltage



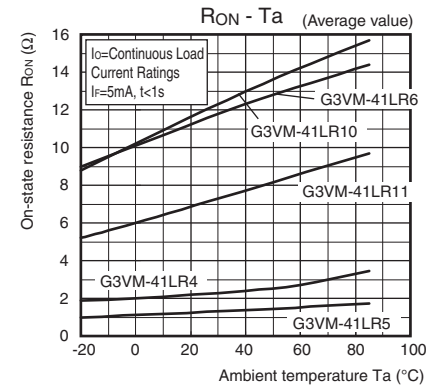
### Continuous load current vs. On-state voltage



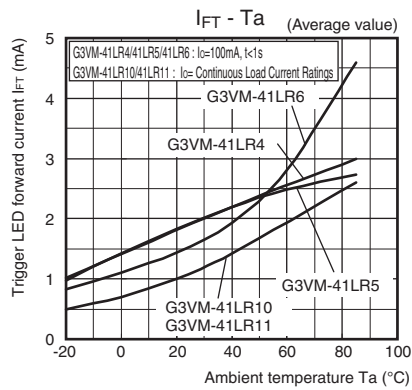
### G3VM-41LR10/41LR11



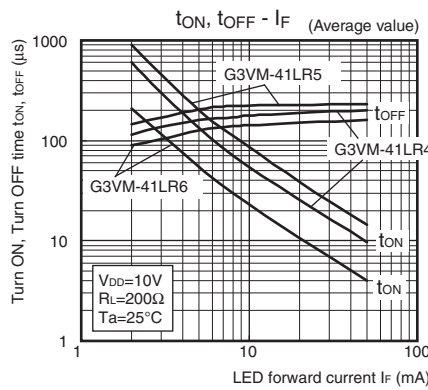
### On-state resistance vs. Ambient temperature



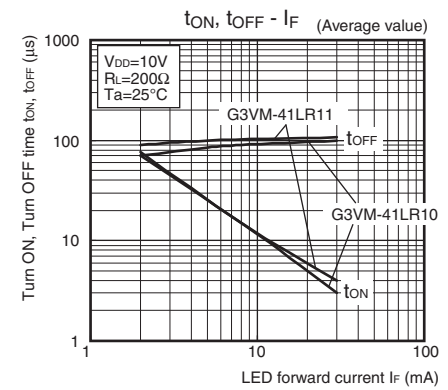
### Trigger LED forward current vs. Ambient temperature



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

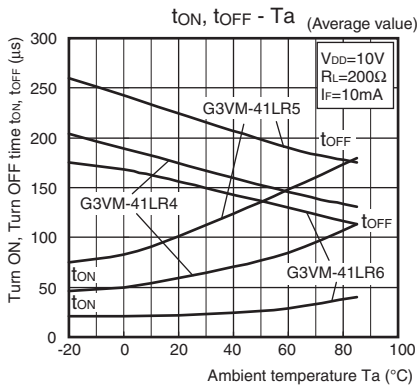


### G3VM-41LR10/41LR11

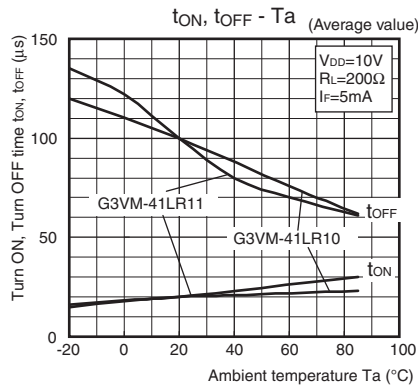


## Engineering Data

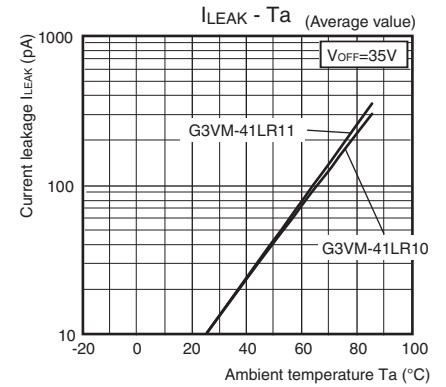
### Turn ON, Turn OFF time vs. Ambient temperature G3VM-41LR6/41LR4/41LR5



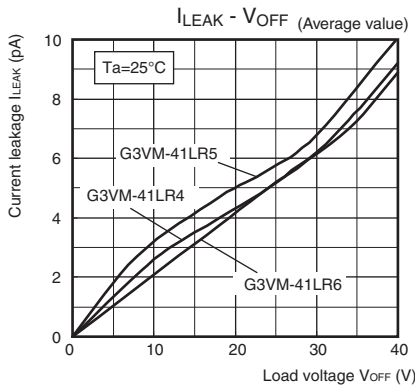
### G3VM-41LR10/41LR11



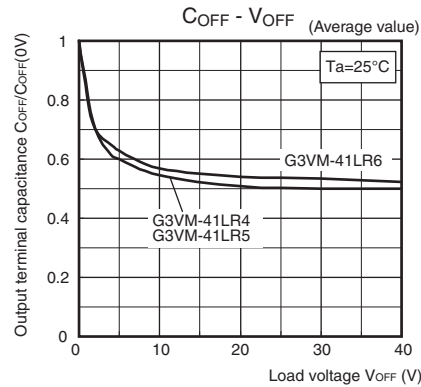
### Current leakage vs. Ambient temperature G3VM-41LR10/41LR11



### Current leakage vs. Load voltage G3VM-41LR6/41LR4/41LR5



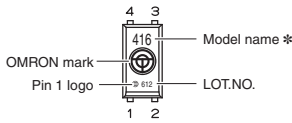
### Output terminal capacitance vs. Load voltage G3VM-41LR6/41LR4/41LR5



## ■ Appearance / Terminal Arrangement / Internal Connections

### ● Appearance

SSOP (Shrink Small Outline Package)  
SSOP 4-pin



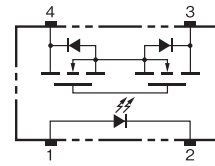
**Note: 1.** The actual product is marked differently from the image shown here.

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

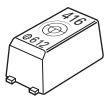
\* Actual model name marking for each model

Model	Marking
G3VM-41LR10	41A
G3VM-41LR6	416
G3VM-41LR11	41B
G3VM-41LR4	414
G3VM-41LR5	415

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

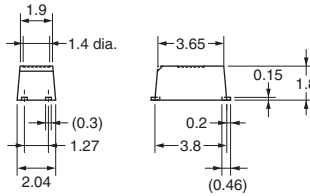
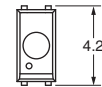


## ■ Dimensions (Unit: mm)



### Surface-mounting Terminals

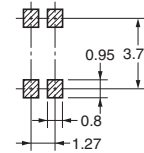
Weight: 0.03 g



Unless otherwise specified, the dimensional tolerance is  $\pm 0.1$  mm.

### 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.

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

## OMRON Corporation

Electronic and Mechanical Components Company

### Regional Contact

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