

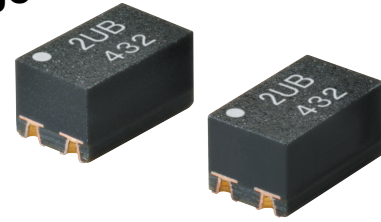
# G3VM-41UR□/51UR

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

## World's smallest \* class New VSON Package with Low Output Capacitance and Low ON Resistance

\* As of November 2016 Survey by OMRON.

- Load voltage: 40 V or 50 V
- G3VM-41UR12: Low C × R = 4.5 pF·Ω, C<sub>OFF</sub> (standard) = 0.3 pF, R<sub>ON</sub> (standard) = 15 Ω
- G3VM-41UR10: Low C × R = 5.4 pF·Ω, C<sub>OFF</sub> (standard) = 0.45 pF, R<sub>ON</sub> (standard) = 12 Ω
- G3VM-41UR11: Low C × R = 4.9 pF·Ω, C<sub>OFF</sub> (standard) = 0.7 pF, R<sub>ON</sub> (standard) = 7 Ω
- G3VM-51UR: Low C × R = 12 pF·Ω, C<sub>OFF</sub> (standard) = 12 pF, R<sub>ON</sub> (standard) = 1 Ω
- High Ambient operating temperature: -40°C to +110°C



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

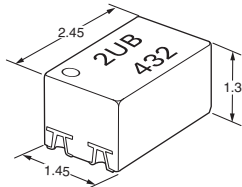
RoHS Compliant

### Application Examples

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

### Package (Unit : mm, Average)

VSON 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

- 4: 40 V
- 5: 50 V

#### 2. Contact form

- 1: 1a (SPST-NO)

#### 3. Package

- U: VSON 4-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) *	Tape cut packaging		Tape packaging	
					Model	Minimum package quantity	Model	Minimum package quantity
VSON4	1a (SPST-NO)	Surface-mounting Terminals	40 V	100 mA	G3VM-41UR12	1 pc.	G3VM-41UR12(TR05)	500 pcs.
				120 mA	G3VM-41UR10		G3VM-41UR10(TR05)	
			140 mA	G3VM-41UR11	G3VM-41UR11(TR05)			
			50 V	300 mA	G3VM-51UR		G3VM-51UR(TR05)	

Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.

Tape-cut VSONs are packaged without humidity resistance. Use manual soldering to mount them.

Refer to common precautions.

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

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

Item		Symbol	G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-51UR	Unit	Measurement conditions
Input	LED forward current	IF	30				mA	
	LED forward current reduction rate	ΔIF/°C	-0.3				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>	40			50	V	
	Continuous load current (AC peak/DC)	Io	100	120	140	300	mA	
	ON current reduction rate	ΔIo/°C	-1.0	-1.2	-1.4	-3	mA/°C	Ta≥25°C
	Pulse ON current	I <sub>op</sub>	300	360	420	900	mA	t=100 ms, Duty=1/10
	Connection temperature	TJ	125				°C	
Dielectric strength between I/O (See note 1.) (See note 2.)		V <sub>I-O</sub>	500				V <sub>RMS</sub>	AC for 1 min
Ambient operating temperature		Ta	-40 to +110				°C	With no icing or condensation
Ambient storage temperature		T <sub>stg</sub>	-40 to +125				°C	
Soldering temperature		-	260				°C	10 s

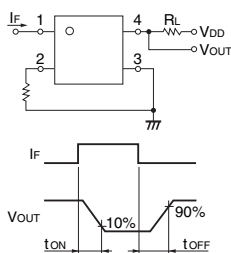
**Note: 1.** The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

**2.** Dielectric strength between I/O 500V<sub>RMS</sub> is applied from production in December 2016. (Before changes are 300V<sub>RMS</sub>.)

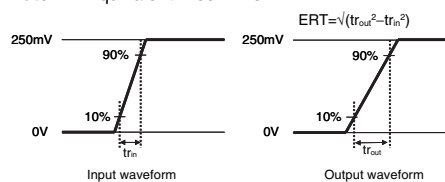
## Electrical Characteristics (Ta = 25°C)

Item		Symbol	G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-51UR	Unit	Measurement conditions	
Input	LED forward voltage	Minimum	1.1				V	I <sub>F</sub> =10 mA	
		Typical	1.27						
		Maximum	1.4						
	Reverse current	I <sub>R</sub>	10				μA	V <sub>R</sub> =5 V	
	Capacitance between terminals	C <sub>T</sub>	30				pF	V=0, f=1 MHz	
Trigger LED forward current	I <sub>FT</sub>	Typical	0.9	-	0.7	-	mA	I <sub>o</sub> =100 mA	
		Maximum	3						
Release LED forward current	I <sub>FC</sub>	Minimum	0.1				mA	I <sub>OFF</sub> =10 μA	
Output	Maximum resistance with output ON	Typical	15	12	7	1	Ω	I <sub>F</sub> =5 mA, t<1 s, I <sub>o</sub> =Continuous load current ratings	
		Maximum	20	14	10	1.5			
	Current leakage when the relay is open	I <sub>LEAK</sub>	1				nA	V <sub>OFF</sub> =Load voltage ratings	
Capacitance between terminals	C <sub>OFF</sub>	Typical	0.3	0.45	0.7	12	pF	V=0, f=100 MHz, t<1 s	
		Maximum	0.6	0.8	1.3	20			
Capacitance between I/O terminals	C <sub>I-O</sub>	Typical	1				pF	f=1 MHz, V <sub>S</sub> =0 V	
Insulation resistance between I/O terminals	R <sub>I-O</sub>	Typical	10 <sup>8</sup>				MΩ	V <sub>I-O</sub> =500 VDC, RoH≤60%	
Turn-ON time	t <sub>ON</sub>	Typical	0.05	-	0.06	-	ms	I <sub>F</sub> =5 mA, R <sub>L</sub> =200 Ω, V <sub>DD</sub> =20 V (See note 2.)	
		Maximum	0.2						
Turn-OFF time	t <sub>OFF</sub>	Typical	0.03	-	0.03	-	ms	I <sub>F</sub> =5 mA, V <sub>DD</sub> =0.25 V, T <sub>r(in)</sub> =25 ps (See Note.3)	
		Maximum	0.2	0.3	0.2	0.4			
Equivalent rise time	ERT	Typical	-				40	ps	I <sub>F</sub> =5 mA, V <sub>DD</sub> =0.25 V, T <sub>r(in)</sub> =25 ps (See Note.3)
		Maximum	-				90		

**Note: 3.** Turn-ON and Turn-OFF Times



**Note: 4.** Equivalent Rise Time



## Recommended Operating Conditions

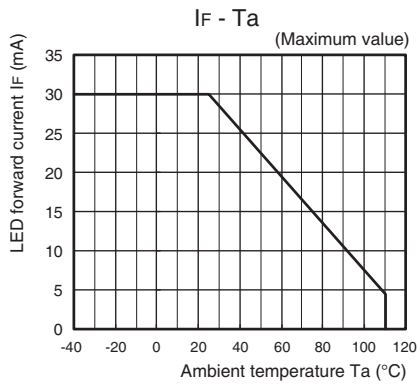
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

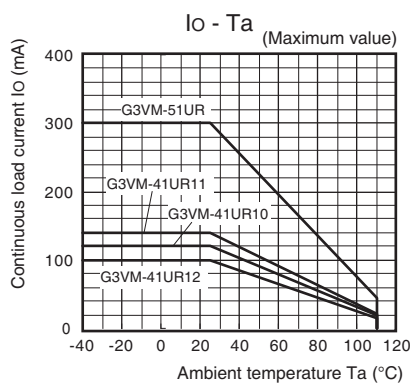
Item	Symbol		G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-51UR	Unit	
Load voltage (AC peak/DC)	V <sub>DD</sub>	Maximum	32				40	V
		Minimum	5					
Operating LED forward current	I <sub>F</sub>	Typical	7.5				mA	
		Maximum	20					
		Maximum	100	120	140	300		
Ambient operating temperature	Ta	Minimum	-20				°C	
		Maximum	85					

## Engineering Data

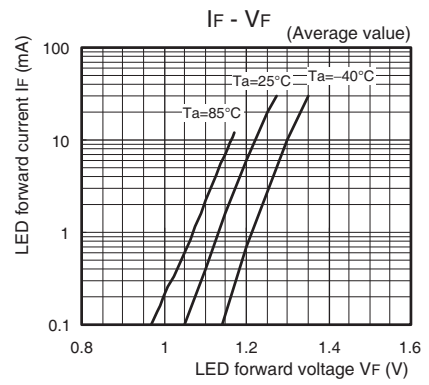
### LED forward current vs. Ambient temperature



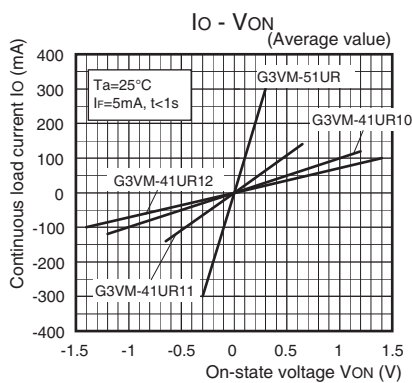
### Continuous load current vs. Ambient temperature



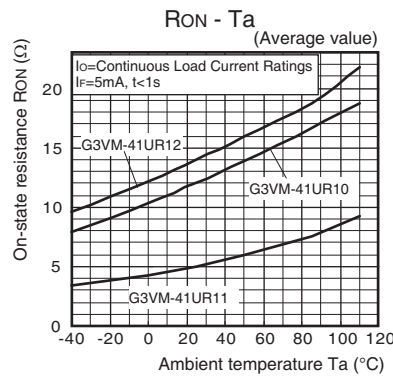
### LED forward current vs. LED forward voltage



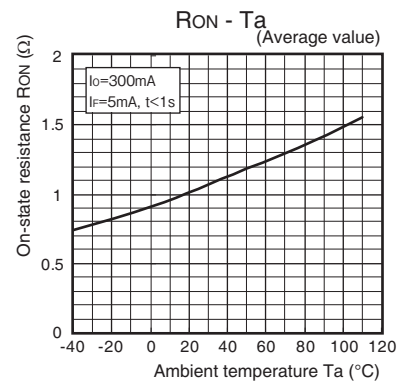
### Continuous load current vs. On-state voltage



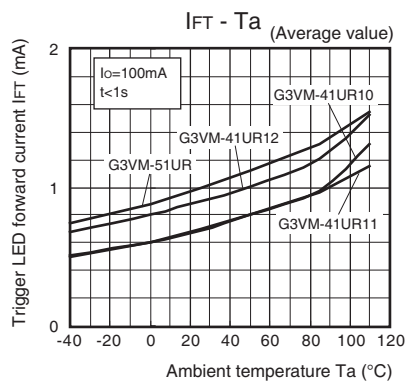
### On-state resistance vs. Ambient temperature



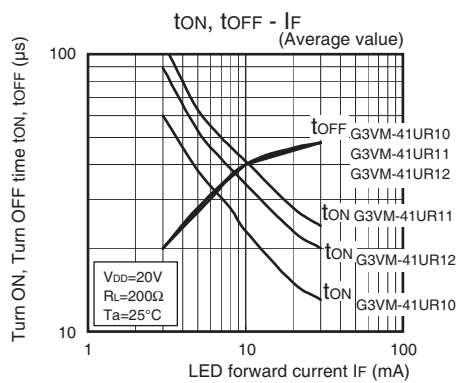
### G3VM-51UR



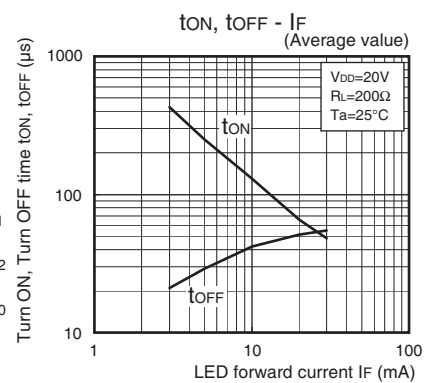
### Trigger LED forward current vs. Ambient temperature



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



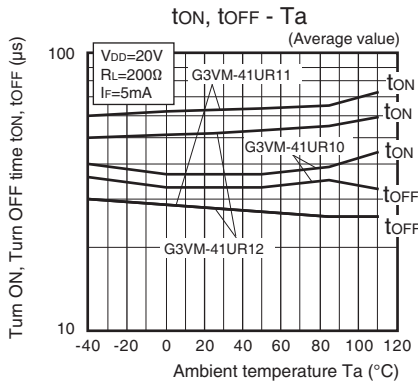
### G3VM-51UR



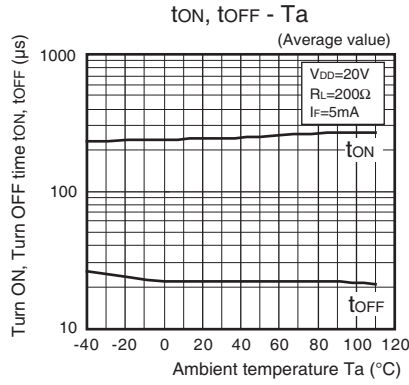
## Engineering Data

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

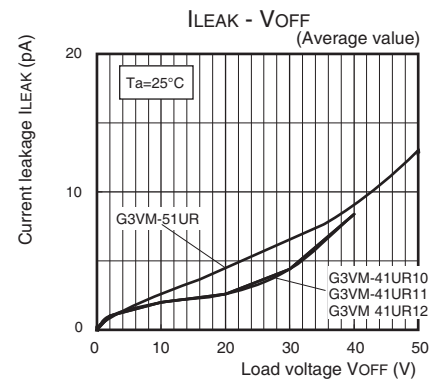
G3VM-41UR12/41UR10/41UR11



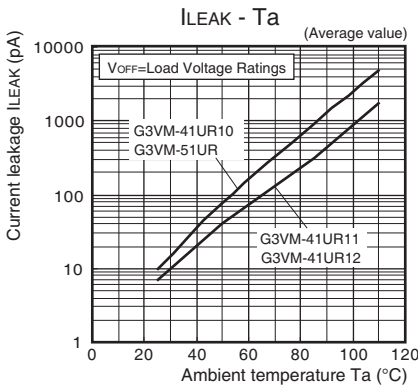
### G3VM-51UR



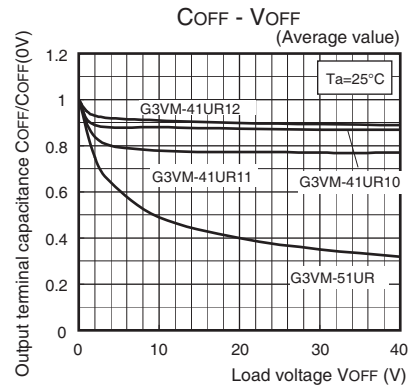
### Current leakage vs. Load voltage



### Current leakage vs. Ambient temperature



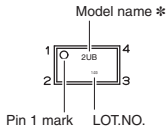
### Output terminal capacitance vs. Load voltage



## ■ Appearance / Terminal Arrangement / Internal Connections

### ● Appearance

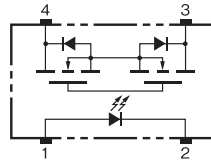
VSON (Very Small Outline Non-leaded)  
VSON 4-pin



\* Actual model name marking for each model

Model	Marking
G3VM-41UR12	4UC
G3VM-41UR10	4UA
G3VM-41UR11	4UB
G3VM-51UR	5U0

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

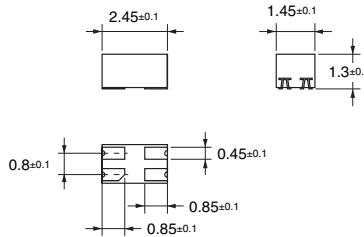
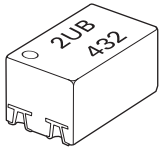


**Note: 1.** The actual product is marked differently from the image shown here.  
**Note: 2.** "G3VM" does not appear in the model number on the Relay.

## ■ Dimensions (Unit: mm)

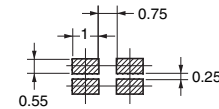
### Surface-mounting Terminals

Weight: 0.01 g



### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

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

## ■ Safety Precautions

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

• Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.  
• Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

**Note: Do not use this document to operate the Unit.**

**OMRON Corporation**

Electronic and Mechanical Components Company

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