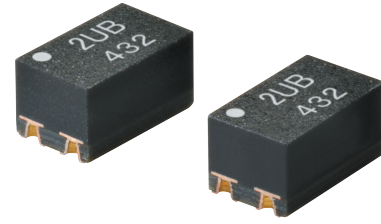


# G3VM-41UR□/51UR

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

## A Lineup of Compact VSONs with a Mounting Area of 3.55 mm<sup>2</sup> MOS FET Relays with Low Output Capacitance and Low ON Resistance

- 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-41UR4: Low C × R = 10 pF·Ω, C<sub>OFF</sub> (standard) = 5 pF, R<sub>ON</sub> (standard) = 2 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



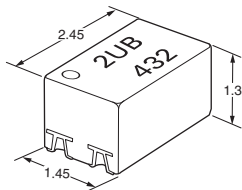
Note: The actual product is marked differently from the image shown here.

### 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) *	Stick 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)	
				250 mA	G3VM-41UR4		G3VM-41UR4(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-41UR4	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	6	5	V						
	Junction temperature	TJ					125	°C					
Output	Load voltage (AC peak/DC)	VOFF				40	50	V					
	Continuous load current (AC peak/DC)	Io	100	120	140	250	300	mA					
	ON current reduction rate	ΔIo/°C					-1.0	-1.2	-1.4	-2.5	-3	mA/°C	Ta≥25°C
	Pulse ON current	Iop					300	360	420	750	900	mA	t=100 ms, Duty=1/10
Junction temperature	TJ					125	°C						
Dielectric strength between I/O *1 *2	VI-o					500	Vrms	AC for 1 min					
Ambient operating temperature	Ta					-40 to +110	°C	With no icing or condensation					
Ambient storage temperature	Tstg					-40 to +125							
Soldering temperature	-					260			10 s				

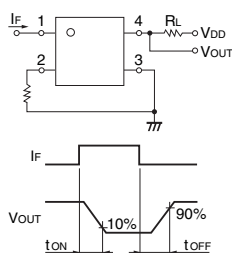
\*1. In terms of its structure, this product is sensitive to static electricity. Therefore, be sure to take measures against static electricity for the workbenches, people, soldering iron, solder mounting equipment, etc.

\*2. 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.

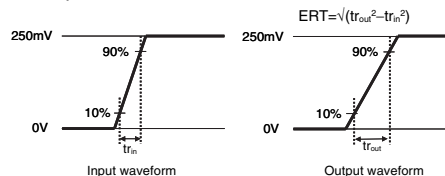
## Electrical Characteristics (Ta = 25°C)

Item	Symbol	G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-41UR4	G3VM-51UR	Unit	Measurement conditions		
Input	LED forward voltage	VF	Minimum				1.1	V	IF=10 mA	
		Typical				1.27				
		Maximum				1.4				
	Reverse current	IR	Maximum				10	μA	VR=5 V	
	Capacitance between terminals	CT	Typical				30	pF	V=0 V, f=1 MHz	
	Trigger LED forward current	IFT	Typical	0.9	-	0.7	0.8	-	mA	G3VM-41UR12/41UR10/ 41UR11/51UR:Io=100 mA G3VM-41UR4:Io=250 mA
Maximum			3							
Release LED forward current	IFC	Minimum				0.1	mA	IOFF=10 μA		
Output	Maximum resistance with output ON	RON	Typical	15	12	5	2	1	Ω	IF=5 mA, t<1 s, Io=Continuous load current ratings
		Maximum	20	14	10	3	1.5			
	Current leakage when the relay is open	ILEAK	Maximum				1	nA	G3VM-41UR12/41UR10/ 41UR11/51UR: VOFF=Load voltage ratings, G3VM-41UR4: VOFF=30 V, Ta=50°C	
Capacitance between terminals	COFF	Typical	0.3	0.45	0.7	5	12	pF	G3VM-41UR12/41UR10/ 41UR11/51UR: V=0 V, f=100 MHz, t<1 s G3VM-41UR4: V=0 V, f=1 MHz	
		Maximum	0.6	0.8	1.3	7	20			
Capacitance between I/O terminals	CI-o	Typical				1	pF	Vs=0 V, f=1 MHz		
Insulation resistance between I/O terminals	RI-o	Typical				10 <sup>8</sup>	MΩ	VI-o=500 VDC, RoH≤60%		
Turn-ON time	ton	Typical	0.05	-	0.06	0.08	-	ms	IF=5 mA, RL=200 Ω, VDD=20 V *1	
		Maximum	0.2				0.3			0.5
Turn-OFF time	toff	Typical	0.03	-	0.03	0.04	-	ms	IF=5 mA, RL=200 Ω, VDD=20 V *1	
		Maximum	0.2	0.3	0.2	0.3	0.4			
Equivalent rise time	ERT	Typical	-				40	ps	IF=5 mA, VDD=0.25 V, Tr(in)=25 ps *2	
		Maximum	-				90			

\*1. Turn-ON and Turn-OFF Times



\*2. Equivalent Rise Time



## Recommended Operating Conditions

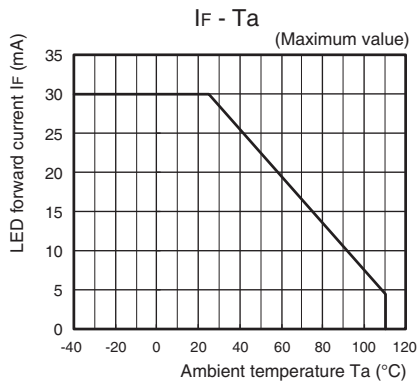
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

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

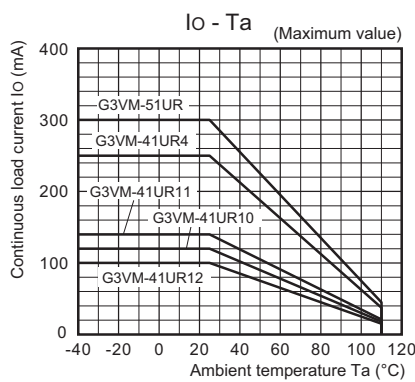
Item	Symbol		G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-41UR4	G3VM-51UR	Unit	
Load voltage (AC peak/DC)	$V_{DD}$	Maximum	32				40		V
Operating LED forward current	$I_F$	Minimum	5			–	5	mA	
		Typical	7.5			5	7.5		
		Maximum	20						
Continuous load current (AC peak/DC)	$I_O$	Maximum	100	120	140	250	300		
Ambient operating temperature	$T_a$	Minimum	–20						°C
		Maximum	85						

## Engineering Data

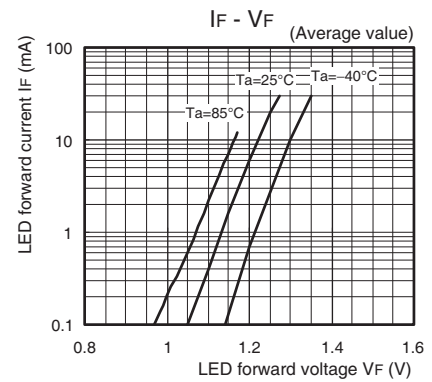
### LED forward current vs. Ambient temperature



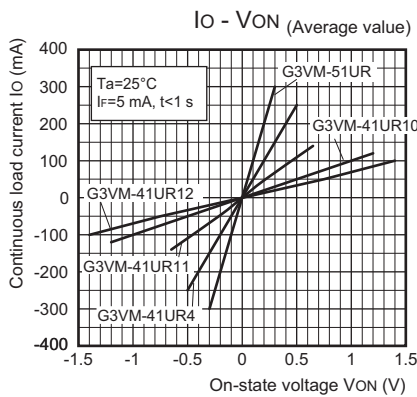
### Continuous load current vs. Ambient temperature



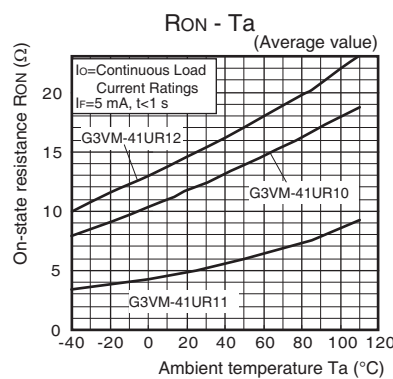
### LED forward current vs. LED forward voltage



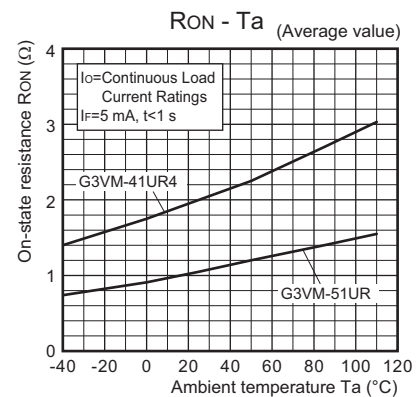
### Continuous load current vs. On-state voltage



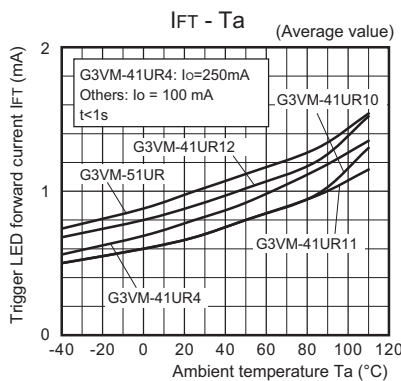
### On-state resistance vs. Ambient temperature



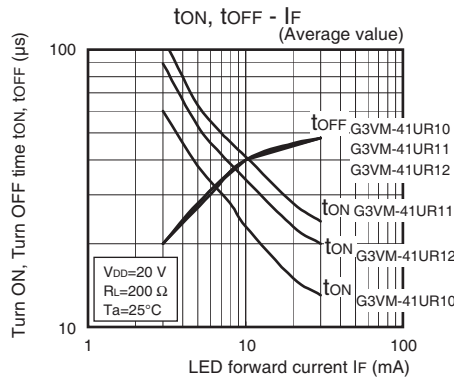
### G3VM-51UR/41UR4



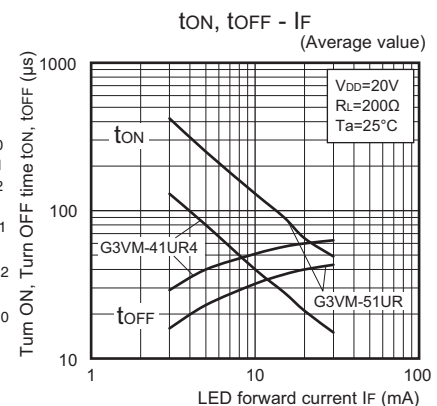
### Trigger LED forward current vs. Ambient temperature



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

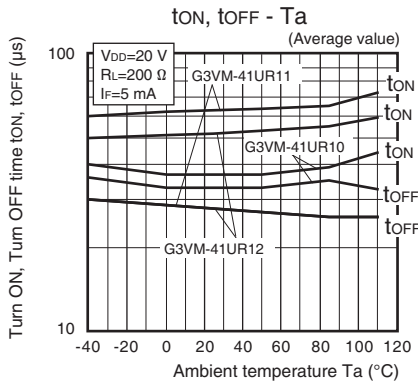


### G3VM-51UR/41UR4

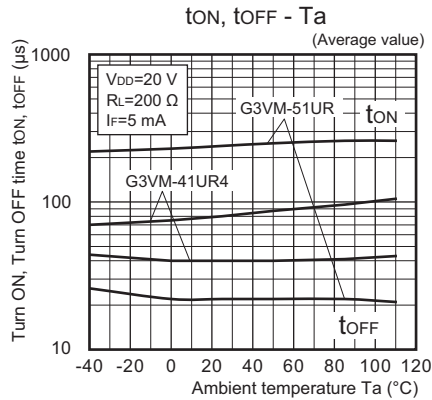


## Engineering Data

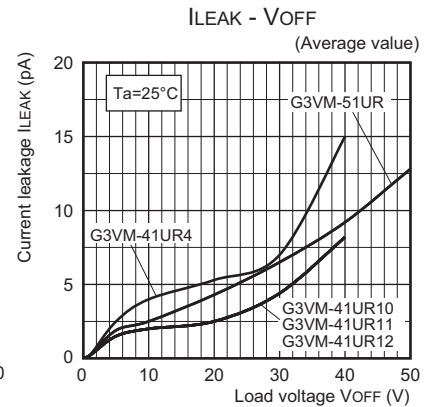
### Turn ON, Turn OFF time vs. Ambient temperature G3VM-41UR12/41UR10/41UR11



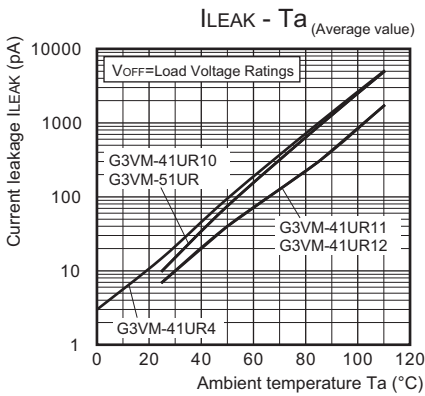
### G3VM-51UR/41UR4



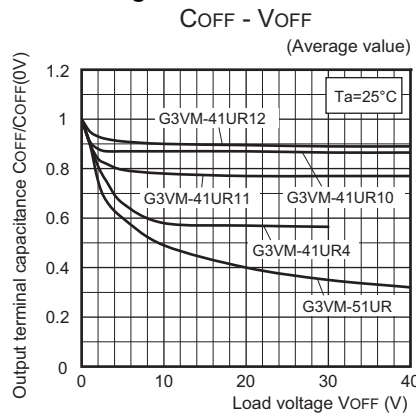
### Current leakage vs. Load voltage



### Current leakage vs. Ambient temperature



### Output terminal capacitance vs. Load voltage

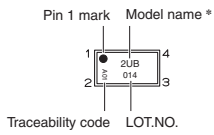


## Appearance / Terminal Arrangement / Internal Connections

### Appearance

VSON (Very Small Outline Non-leaded)

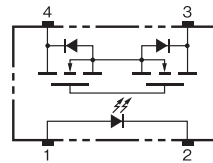
VSON 4-pin



\* Actual model name marking for each model

Model	Marking
G3VM-41UR12	4UC
G3VM-41UR10	4UA
G3VM-41UR11	4UB
G3VM-41UR4	4U4
G3VM-51UR	5U0

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



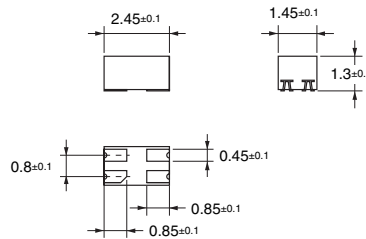
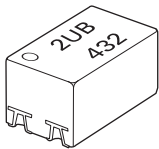
**Note: 1.** The actual product is marked differently from the image shown here.

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

## Dimensions (Unit: mm)

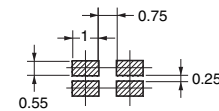
### Surface-mounting Terminals

Weight: 0.01 g



### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



Note: 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.

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Device & Module Solutions Company

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