

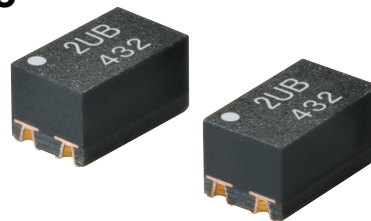
# G3VM-21UR□

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

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

\* As of November 2016 Survey by OMRON.

- Load voltage: 20 V
- G3VM-21UR10: Low  $C \times R = 2.4 \text{ pF} \cdot \Omega$ ,  $C_{\text{OFF}}$  (standard) = 0.8 pF,  $R_{\text{ON}}$  (standard) = 3  $\Omega$
- G3VM-21UR1: Low  $C \times R = 4 \text{ pF} \cdot \Omega$ ,  $C_{\text{OFF}}$  (standard) = 5 pF,  $R_{\text{ON}}$  (standard) = 0.8  $\Omega$
- G3VM-21UR11: Low  $C \times R = 7.2 \text{ pF} \cdot \Omega$ ,  $C_{\text{OFF}}$  (standard) = 40 pF,  $R_{\text{ON}}$  (standard) = 0.18  $\Omega$
- High Ambient operating temperature: -40°C to +110°C



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

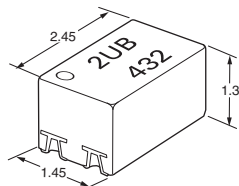
RoHS Compliant

### Application Examples

- Semiconductor test equipment
- Test & measurement equipment
- Communication 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**  
2: 20 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	20 V	200 mA	G3VM-21UR10	1 pc.	G3VM-21UR10(TR05)	500 pcs.
				450 mA	G3VM-21UR1		G3VM-21UR1(TR05)	
				1,000 mA	G3VM-21UR11		G3VM-21UR11(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-21UR10	G3VM-21UR1	G3VM-21UR11	Unit	Measurement conditions
Input	LED forward current	IF	30			mA	
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.3			mA/°C	Ta $\geq$ 25°C
	LED reverse voltage	VR	5			V	
	Connection temperature	TJ	125			°C	
Output	Load voltage (AC peak/DC)	V <sub>OFF</sub>	20			V	
	Continuous load current (AC peak/DC)	Io	200	450	1,000	mA	
	ON current reduction rate	$\Delta I_o/^\circ\text{C}$	-2	-4.5	-10	mA/°C	Ta $\geq$ 25°C
	Pulse ON current	I <sub>op</sub>	0.6	1.3	3	A	t=100 ms, Duty=1/10
	Connection temperature	TJ	125			°C	
Dielectric strength between I/O *1 *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

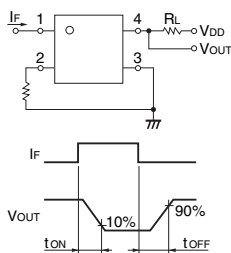
\*1. The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

\*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-21UR10	G3VM-21UR1	G3VM-21UR11	Unit	Measurement conditions
Input	LED forward voltage	VF	1.1			V	IF=10 mA
		Minimum	1.1				
		Typical	1.22				
	Reverse current	IR	10			μA	VR=5 V
	Capacitance between terminals	CT	30			pF	V=0, f=1 MHz
	Trigger LED forward current	IFT	0.9	0.6	-	mA	Io=100 mA
Maximum		3					
Output	Release LED forward current	IFC	0.1			mA	I <sub>OFF</sub> =10 μA
	Maximum resistance with output ON	RON	3	0.8	0.18	Ω	IF=5 mA, t<1 s, Io=Continuous load current ratings
		Maximum	5	1.2	0.22		
	Current leakage when the relay is open	I <sub>LEAK</sub>	1			nA	V <sub>OFF</sub> =20 V
	Capacitance between terminals	COFF	0.8	5	40	pF	V=0, f=100 MHz, t<1 s
Maximum		1.1	12	-			
Capacitance between I/O terminals		CI-O	1			pF	f=1 MHz, Vs=0 V
Insulation resistance between I/O terminals		RI-O	10 <sup>8</sup>			MΩ	VI-O=500 VDC, RoH $\leq$ 60%
Turn-ON time	ton	Typical	0.05	0.17	-	ms	IF=5 mA, RL=200 Ω, VDD=10 V *
		Maximum	0.2	0.4	2		
Turn-OFF time	toff	Typical	0.02	0.03	-	ms	
		Maximum	0.2	0.4	1		

\* Turn-ON and Turn-OFF Times



## Recommended Operating Conditions

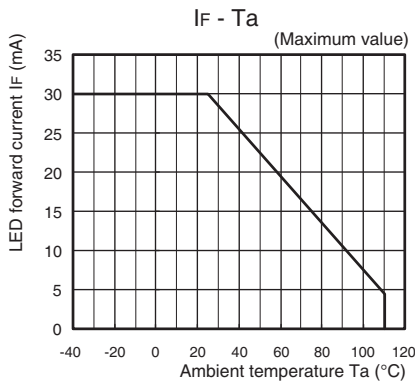
For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

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

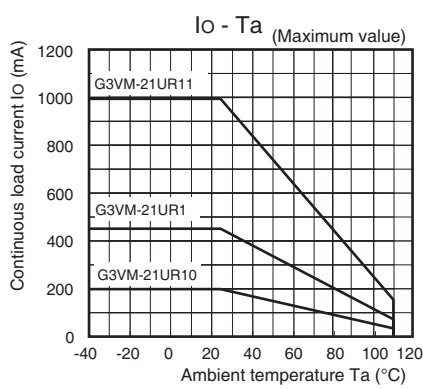
Item	Symbol	G3VM-21UR10	G3VM-21UR1	G3VM-21UR11	Unit
Load voltage (AC peak/DC)	V <sub>DD</sub>	Maximum	16		V
Operating LED forward current	IF	Minimum	5		mA
		Typical	7.5		
		Maximum	20		
Continuous load current (AC peak/DC)	Io	Maximum	200	450	1,000
		Ambient operating temperature	Ta	Minimum	-20
		Maximum	85		

## Engineering Data

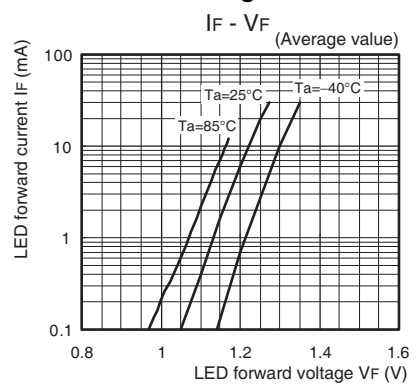
### LED forward current vs. Ambient temperature



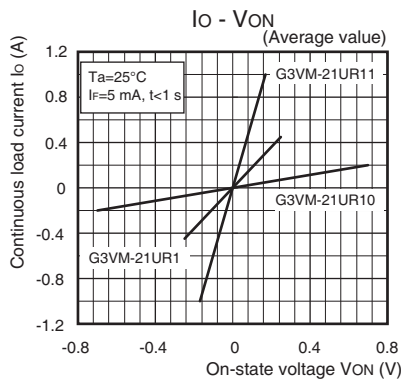
### Continuous load current vs. Ambient temperature



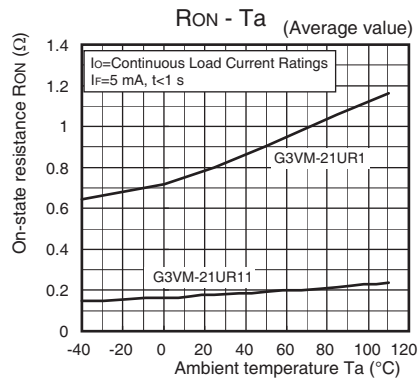
### LED forward current vs. LED forward voltage



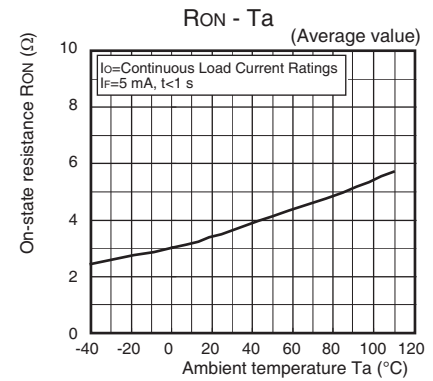
### Continuous load current vs. On-state voltage



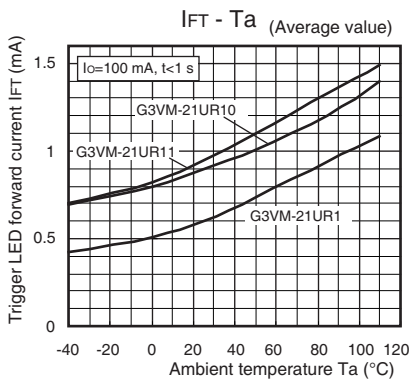
### On-state resistance vs. Ambient temperature



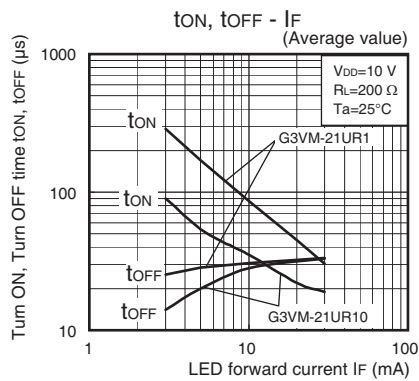
### G3VM-21UR10



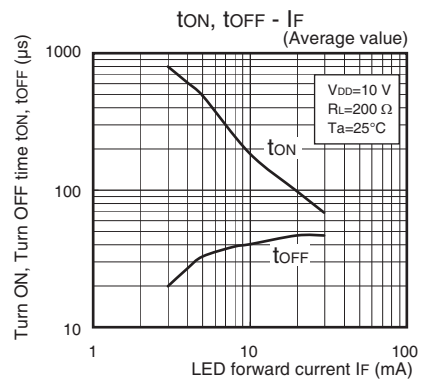
### Trigger LED forward current vs. Ambient temperature



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

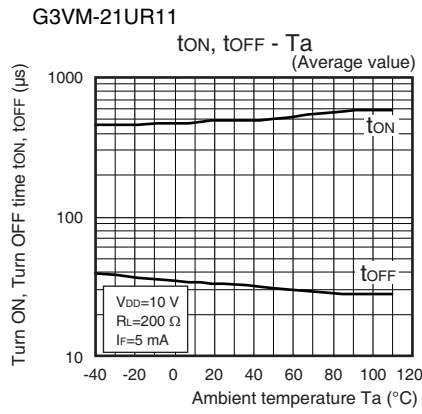
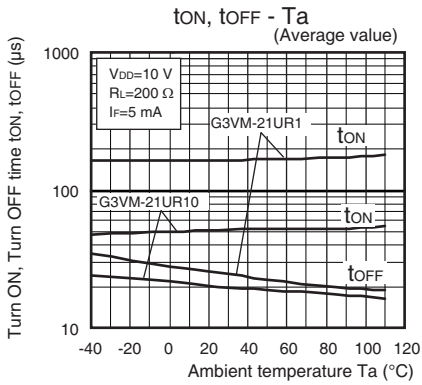


### G3VM-21UR11

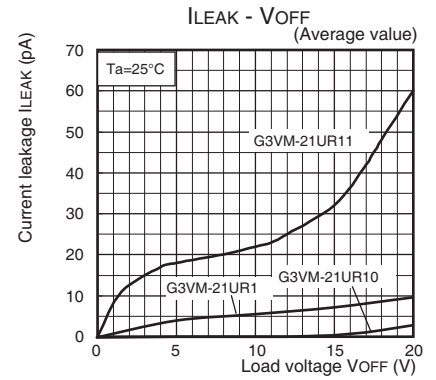


## Engineering Data

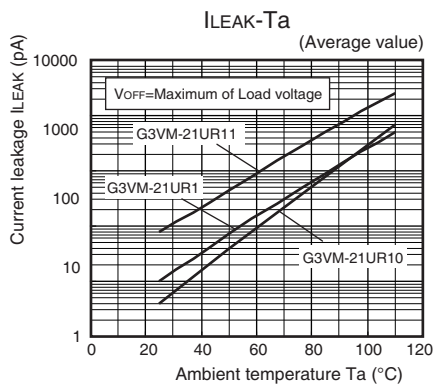
### Turn ON, Turn OFF time vs. Ambient temperature



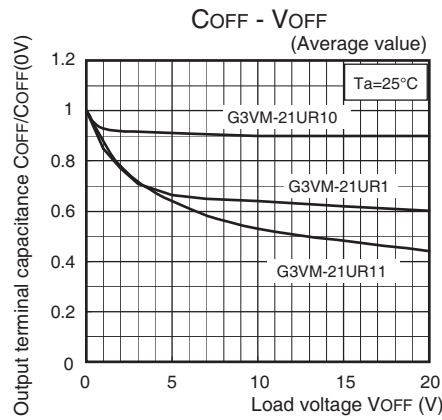
### Current leakage vs. Load voltage



### Current leakage vs. Ambient temperature



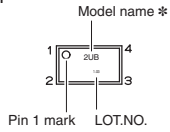
### Output terminal capacitance vs. Load voltage



## Appearance / Terminal Arrangement / Internal Connections

### Appearance

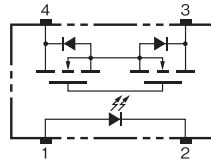
VSON (Very Small Outline Non-leaded)  
VSON 4-pin



\* Actual model name marking for each model

Model	Marking
G3VM-21UR10	2UA
G3VM-21UR1	2U1
G3VM-21UR11	2UB

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

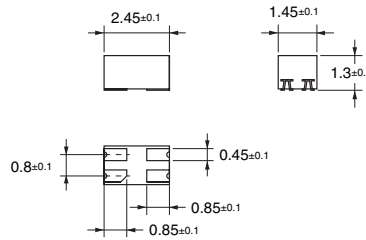
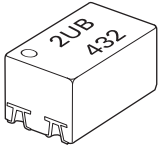


**Note: 1.** The actual product is marked differently from the image shown here.  
**Note: 2.** "G3VM" does not appear in the model number on the Relay.

## Dimensions (Unit: mm)

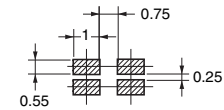
### Surface-mounting Terminals

Weight: 0.01 g



### Actual Mounting Pad Dimensions

(Recommended Value, Top View)



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

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

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Device & Module Solutions Company

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