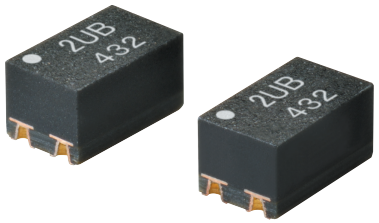
G3VM-41UR□/51UR

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 mm² MOS FET Relays with Low Output Capacitance and Low ON Resistance



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

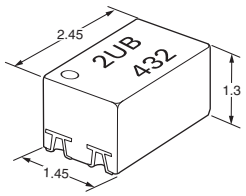
- **Load voltage: 40 V or 50 V**
- **G3VM-41UR12: Low C × R = 4.5 pF·Ω, C_{OFF} (standard) = 0.3 pF, R_{ON} (standard) = 15 Ω**
- **G3VM-41UR10: Low C × R = 5.4 pF·Ω, C_{OFF} (standard) = 0.45 pF, R_{ON} (standard) = 12 Ω**
- **G3VM-41UR11: Low C × R = 4.9 pF·Ω, C_{OFF} (standard) = 0.7 pF, R_{ON} (standard) = 7 Ω**
- **G3VM-41UR4: Low C × R = 10 pF·Ω, C_{OFF} (standard) = 5 pF, R_{ON} (standard) = 2 Ω**
- **G3VM-51UR: Low C × R = 12 pF·Ω, C_{OFF} (standard) = 12 pF, R_{ON} (standard) = 1 Ω**
- **High Ambient operating temperature: -40°C to +110°C**

■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
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	I_F	30					mA	
	LED forward current reduction rate	ΔI_F/°C	−0.3					mA/°C	Ta≥25°C
	LED reverse voltage	V_R	5			6	5	V	
	Junction temperature	T_J	125					°C	
Output	Load voltage (AC peak/DC)	V_{OFF}	40				50	V	
	Continuous load current (AC peak/DC)	I_O	100	120	140	250	300	mA	
	ON current reduction rate	ΔI_O/°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	T_J	125					°C	
Dielectric strength between I/O ✻1 ✻2		V_{I-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

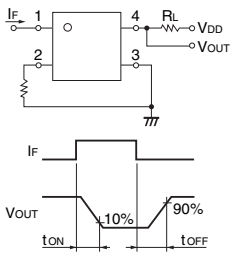
✻1. In terms of its structure, this product is sensitive to static electricity. Therefore, be sure to take measures against static electricity for the workbenches, people, soldering iron, solder mounting equipment, etc.

✻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.

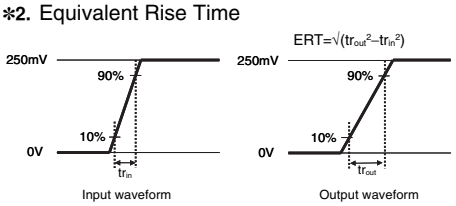
■Electrical Characteristics (Ta = 25°C)

	Item	Symbol		G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-41UR4	G3VM-51UR	Unit	Measurement conditions
Input	LED forward voltage	V_F	Minimum	1.1					V	I_F=10 mA
			Typical	1.27						
			Maximum	1.4						
	Reverse current	I_R	Maximum	10					μA	V_R=5 V
	Capacitance between terminals	C_T	Typical	30					pF	V=0 V, f=1 MHz
	Trigger LED forward current	I_{FT}	Typical	0.9	–	0.7	0.8	–	mA	G3VM-41UR12/41UR10/41UR11/51UR:I_O=100 mA G3VM-41UR4:I_O=250 mA
			Maximum	3						
	Release LED forward current	I_{FC}	Minimum	0.1					mA	I_{OFF}=10 μA
Output	Maximum resistance with output ON	R_{ON}	Typical	15	12	5	2	1	Ω	I_F=5 mA, t<1 s, I_O=Continuous load current ratings
			Maximum	20	14	10	3	1.5		
	Current leakage when the relay is open	I_{LEAK}	Maximum	1					nA	G3VM-41UR12/41UR10/41UR11/51UR: V_{OFF}=Load voltage ratings, G3VM-41UR4: V_{OFF}=30 V,Ta=50°C
	Capacitance between terminals	C_{OFF}	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		C_{I-O}	Typical	1					pF	V_S=0 V, f=1 MHz
Insulation resistance between I/O terminals		R_{I-O}	Typical	10^8					MΩ	V_{I-O}=500 VDC, RoH≤60%
Turn-ON time		t_{ON}	Typical	0.05	–	0.06	0.08	–	ms	I_F=5 mA, R_L=200 Ω, V_{DD}=20 V ✻1
			Maximum	0.2			0.3	0.5		
Turn-OFF time		t_{OFF}	Typical	0.03	–	0.03	0.04	–		
			Maximum	0.2	0.3	0.2	0.3	0.4		
Equivalent rise time		ERT	Typical	–				40	ps	I_F=5 mA, V_{DD}=0.25 V, Tr(in)=25 ps ✻2
			Maximum	–				90		

✻1. Turn-ON and Turn-OFF Times



✻2. Equivalent Rise Time



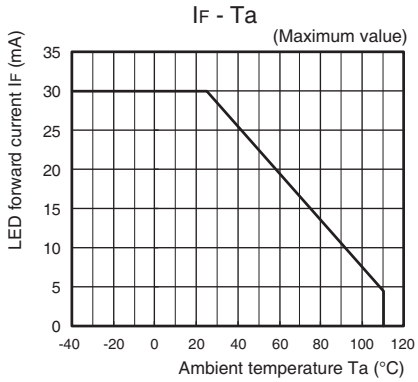
■Recommended Operating Conditions

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.

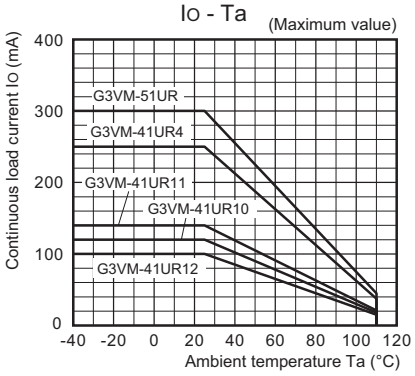
Item	Symbol		G3VM-41UR12	G3VM-41UR10	G3VM-41UR11	G3VM-41UR4	G3VM-51UR	Unit
Load voltage (AC peak/DC)	V_{DD}	Maximum	32				40	V
Operating LED forward current	I_F	Minimum	5			–	5	mA
		Typical	7.5			5	7.5	
		Maximum	20					
Continuous load current (AC peak/DC)	I_O	Maximum	100	120	140	250	300	
Ambient operating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

■Engineering Data

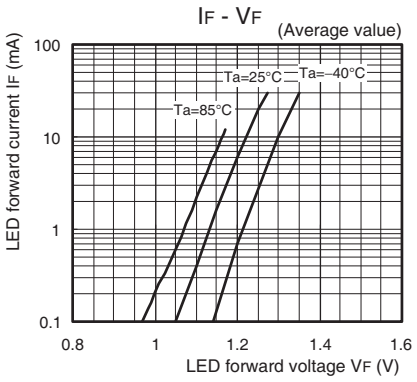
●**LED forward current vs. Ambient temperature**



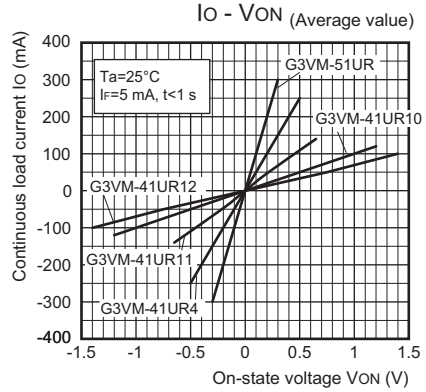
●**Continuous load current vs. Ambient temperature**



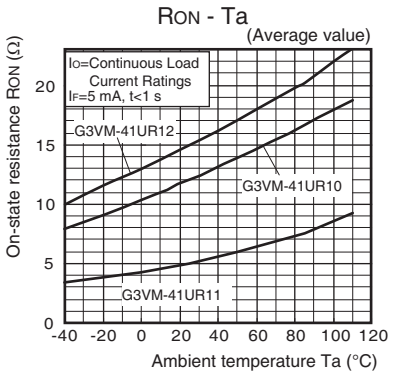
●**LED forward current vs. LED forward voltage**



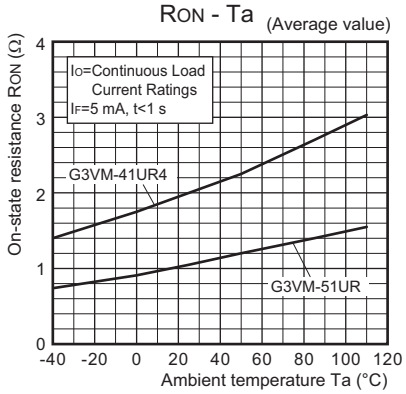
●**Continuous load current vs. On-state voltage**



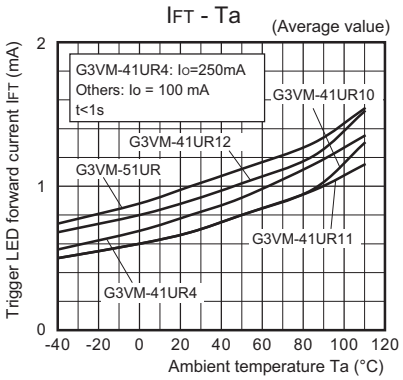
●**On-state resistance vs. Ambient temperature**
G3VM-41UR12/41UR10/41UR11



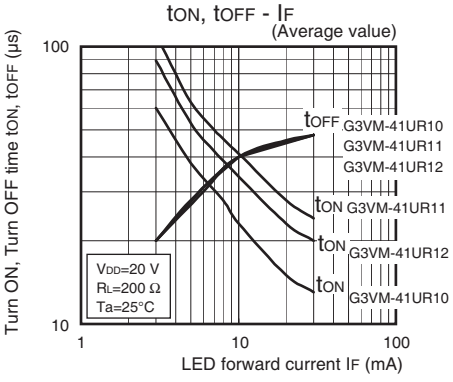
G3VM-51UR/41UR4



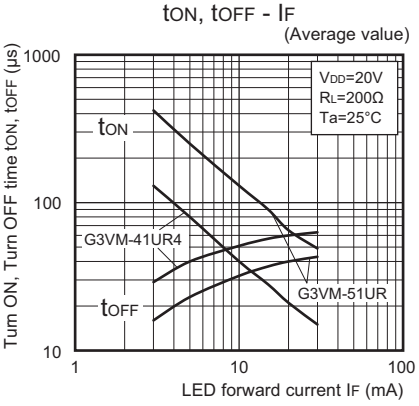
●**Trigger LED forward current vs. Ambient temperature**



●**Turn ON, Turn OFF time vs. LED forward current**
G3VM-41UR12/41UR10/41UR11



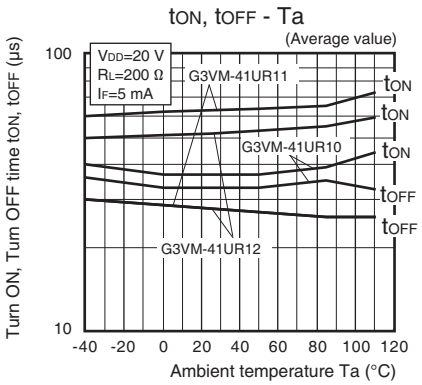
G3VM-51UR/41UR4



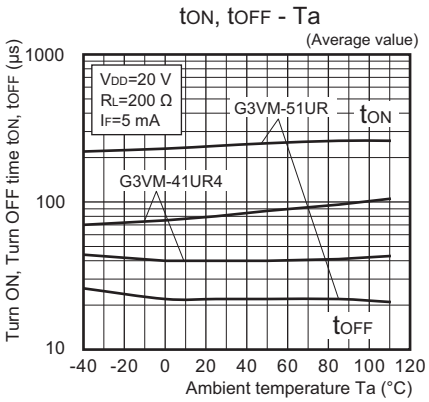
■Engineering Data

●Turn ON, Turn OFF time vs. Ambient temperature

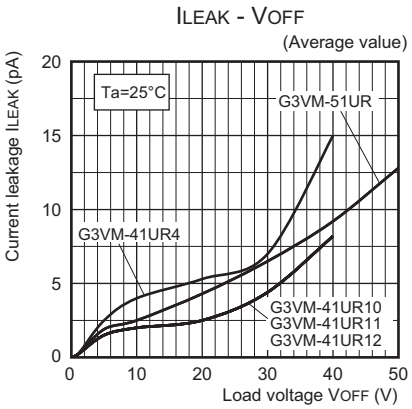
G3VM-41UR12/41UR10/41UR11



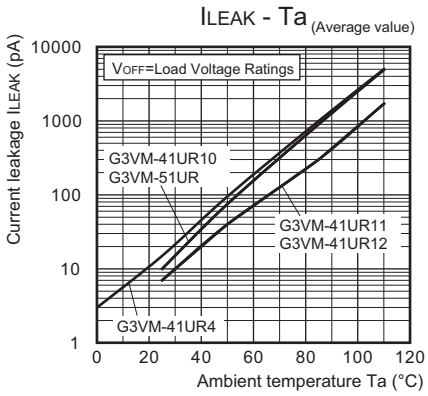
G3VM-51UR/41UR4



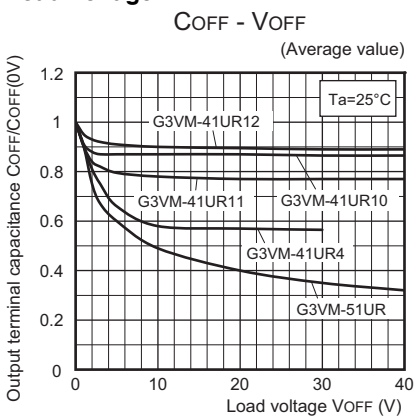
●Current leakage vs. Load voltage



●Current leakage vs. Ambient temperature



●Output terminal capacitance vs. Load voltage

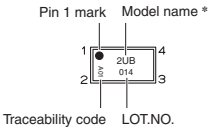


■Appearance / Terminal Arrangement / Internal Connections

●Appearance

VSON (Very Small Outline Non-leaded)

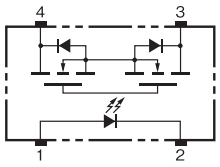
VSON 4-pin



✻ 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)

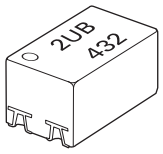


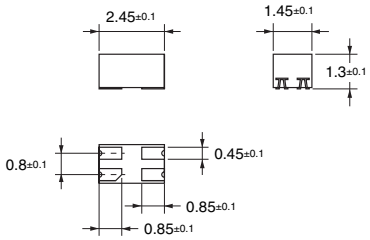
Note: 1. The actual product is marked differently from the image shown here.
Note: 2. "G3VM" does not appear in the model number on the Relay.

■Dimensions (Unit: mm)

Surface-mounting Terminals

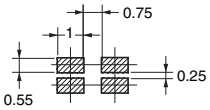
Weight: 0.01 g





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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