

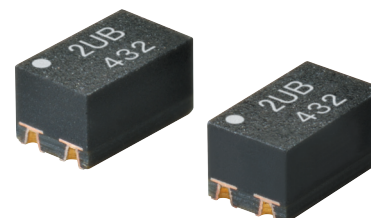
# MOS FET Relays G3VM-41UR10/51UR

**World's Smallest New VSON Package with Low Output Capacitance and Low ON Resistance (Low C × R)**

- RoHS Compliant

**Application Examples**

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



**NEW**

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

**List of Models**

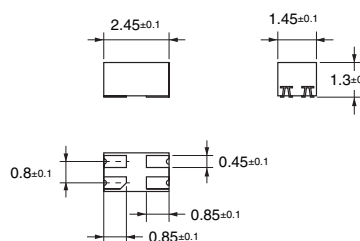
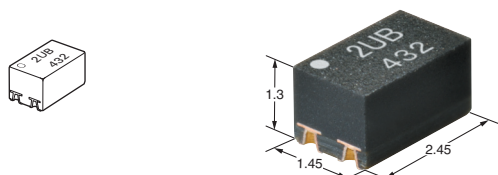
Package type	Contact form	Terminals	Load voltage (peak value)	Continuous Load Current (peak value)	Model	Minimum Packaging Quantity
VSON4	SPST-NO (1FormA)	Surface-mounting terminals	40 VAC or VDC	120 mA	G3VM-41UR10	---
					G3VM-41UR10(TR05)	500
			50 VAC or VDC	300 mA	G3VM-51UR	---
					G3VM-51UR(TR05)	500

**Note:** G3VM-41UR10 and G3VM-51UR, without “(TR05)”, are provided as a Tape-cut versions, for sample purposes. Tape-cut VSON's are packaged without humidity resistance. Use manual soldering to mount them.

**Dimensions**

**Note:** All units are in millimeters unless otherwise indicated.

G3VM-41UR10  
G3VM-51UR

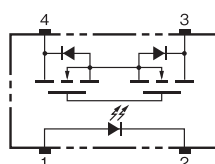


Weight: 0.01 g

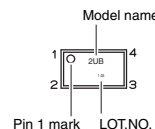
**Note:** The actual product is marked differently from the image shown here.

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

G3VM-41UR10  
G3VM-51UR



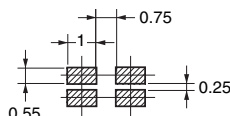
VSON (Very Small Outline Non-leaded)  
VSON4



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

**Actual Mounting Pad Dimensions (Recommended Value, Top View)**

G3VM-41UR10  
G3VM-51UR



■ Absolute Maximum Ratings (Ta = 25°C)

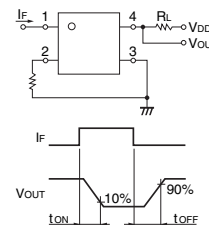
Item		Symbol	G3VM-41UR10	G3VM-51UR	Unit	Measurement Conditions
Input	LED forward current	$I_F$	30		mA	
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.3		mA/°C	$T_a \geq 25^\circ\text{C}$
	LED reverse voltage	$V_R$	5		V	
	Connection temperature	$T_J$	125		°C	
Output	Load voltage (AC peak/DC)	$V_{OFF}$	40	50	V	
	Continuous load current	$I_O$	120	300	mA	
	ON current reduction rate	$\Delta I_{ON}/^\circ\text{C}$	-1.2	-3	mA/°C	$T_a \geq 25^\circ\text{C}$
	Pulse ON current	$I_{OP}$	360	900	mA	$t=100\text{ms}, \text{Duty}=1/10$
	Connection temperature	$T_J$	125		°C	
Dielectric strength between input and output (See note 1.)		$V_{I-O}$	300		$V_{\text{rms}}$	AC for 1 min
Ambient operating temperature		$T_a$	-40 to +85		°C	With no icing or condensation
Ambient storage temperature		$T_{\text{stg}}$	-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.

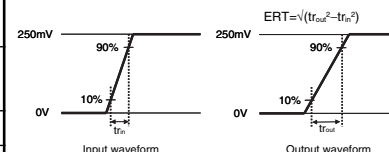
■ Electrical Characteristics (Ta = 25°C)

Item		Symbol	G3VM-41UR10	G3VM-51UR	Unit	Measurement conditions	
Input	LED forward voltage	$V_F$	Minimum	1.1		V	$I_F = 10 \text{ mA}$
			Typical	1.27			
			Maximum	1.4			
	Reverse current	$I_R$	Maximum	10		$\mu\text{A}$	$V_R = 5 \text{ V}$
	Capacity between terminals	$C_T$	Typical	30		pF	$V = 0, f = 1 \text{ MHz}$
Output	Trigger LED forward current	$I_{FT}$	Maximum		3.0	mA	$I_O = 100 \text{ mA}$
	Release LED forward current	$I_{FC}$	Minimum		0.1	mA	$I_{OFF} = 10 \mu\text{A}$
	Maximum resistance with output ON	$R_{ON}$	Typical	12	1	$\Omega$	$I_F = 5 \text{ mA}, t < 1 \text{ s}$ -41UR10 : $I_O = 120 \text{ mA}$ -51UR : $I_O = 300 \text{ mA}$
			Maximum	14	1.5		
	Current leakage when the relay is open	$I_{LEAK}$	Maximum	1		nA	-41UR10 : $V_{OFF} = 40 \text{ V}$ -51UR : $V_{OFF} = 50 \text{ V}$
Capacity between terminals	$C_{OFF}$	Typical	0.45	12	pF	$V = 0, f = 100 \text{ MHz}, t < 1 \text{ s}$	
		Maximum	0.8	20			
Capacity between I/O terminals		$C_{I-O}$	Typical		1	pF	$f = 1 \text{ MHz}, V_s = 0 \text{ V}$
Insulation resistance between I/O terminals		$R_{I-O}$	Typical		$10^8$	M $\Omega$	$V_{I-O} = 500 \text{ VDC}, R_{OH} \leq 60\%$
Turn-ON time		$t_{ON}$	Maximum	0.2	0.5	ms	$I_F = 5 \text{ mA}, R_L = 200 \Omega, V_{DD} = 20 \text{ V}$ (See note 2.)
Turn-OFF time		$t_{OFF}$	Maximum	0.3	0.4	ms	
Equivalent rise time		ERT	Typical	---	40	ps	$I_F = 5 \text{ mA}, V_{DD} = 0.25 \text{ V}$ $Tr(\text{in})=25\text{ps}$ (See note 3.)
			Maximum	---	90		

Note: 2. Turn-ON and Turn-OFF Times



Note: 3. Equivalent Rise Time



■ Recommended Operating Conditions

For usage with high reliability, the Recommended Operating Conditions are measures that takes into account the derating of the Absolute Maximum ratings and the Electrical Characteristics. Each item on this list is an independent condition, not simultaneously satisfying several conditions.

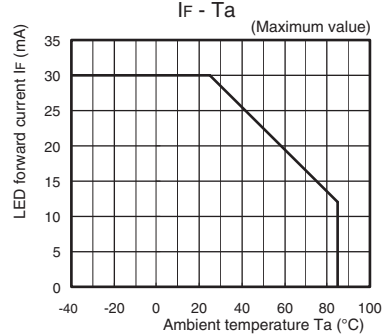
Item	Symbol	G3VM-41UR10	G3VM-51UR	Unit	
Load voltage (AC peak/DC)	$V_{DD}$	Maximum	32	40	V
Operating LED forward current	$I_F$	Minimum	5		mA
		Typical	7.5		
		Maximum	20		
Continuous load current (AC peak/DC)	$I_O$	Maximum	120	300	
Ambient Operating temperature	$T_a$	Minimum	-20		°C
		Maximum	65		

■ **Approved Standards**

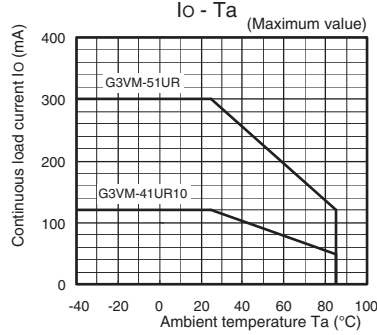
Applying for UL recognition

■ **Engineering Data**

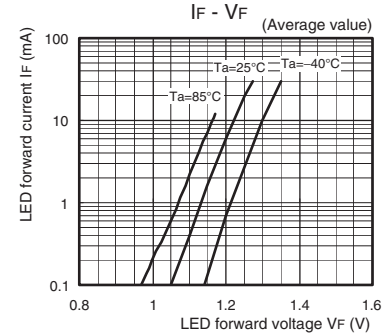
**LED forward current vs. Ambient temperature**



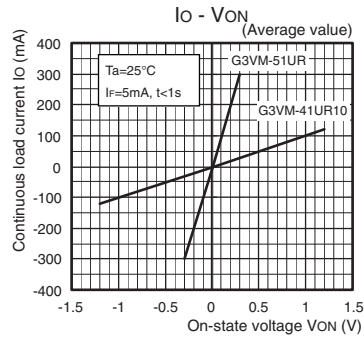
**Continuous load current vs. Ambient temperature**



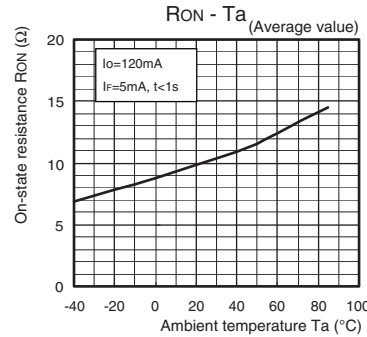
**LED forward current vs. LED forward voltage**



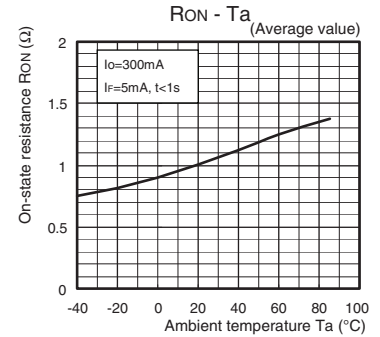
**Continuous load current vs. On-state voltage**



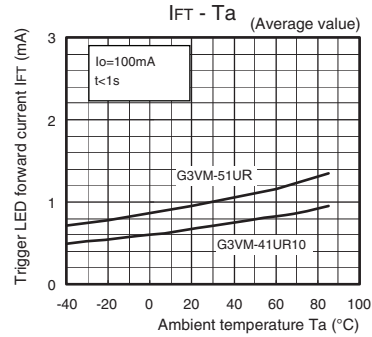
**On-state resistance vs. Ambient temperature G3VM-41UR10**



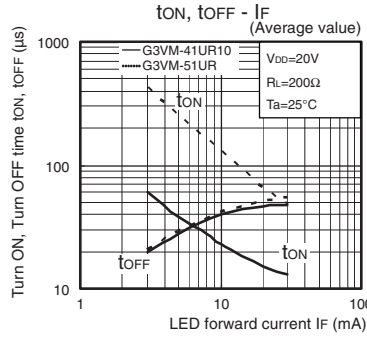
**G3VM-51UR**



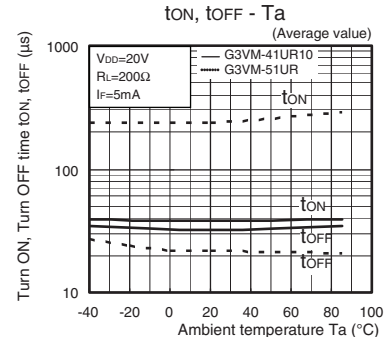
**Trigger LED forward current vs. Ambient temperature**



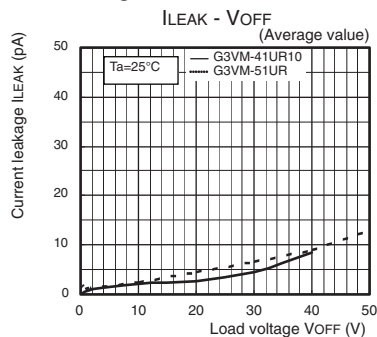
**Turn ON, Turn OFF time vs. LED forward current**



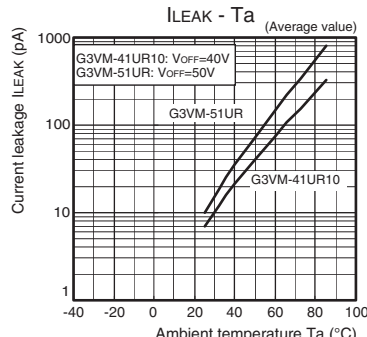
**Turn ON, Turn OFF time vs. Ambient temperature**



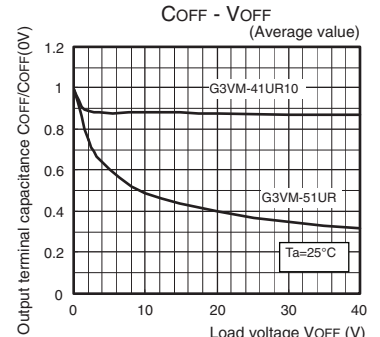
**Current leakage vs. Load voltage**



**Current Leakage vs. Ambient Temperature**



**Output terminal capacitance vs. Load voltage**



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