# MOS FET Relays G3VM-41LR10

SSOP Package MOS FET Relays with Low Leakage Current, Output Capacitance and ON Resistance (C  $\times$  R = 5.4 pF• $\Omega$ ) in a 40-V Load Voltage Model.

- Output capacitance of 0.45 pF (typical) allows high frequency applications.
- Leakage current of 0.2 nA max. (10 pA typ.) when relay is open
- Turn-on time = 0.026 ms (typ.)
- · RoHS compliant

#### **■** Application Examples

- Semiconductor inspection tools
- Measurement devices and Data loggers
- Broadband systems





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

#### **■** List of Models

Contact form	Terminals	Load voltage (peak value)	Model	Number per tape
SPST-NO	Surface-mounting	40 VAC	G3VM-41LR10	
	terminals		G3VM-41LR10(TR05)	500
			G3VM-41LR10(TR)	1,500

#### **■** Dimensions

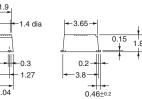
Note: All units are in millimeters unless otherwise indicated.

G3VM-41LR10



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



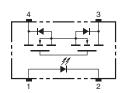


Note: A tolerance of  $\pm 0.1$  mm applies to all dimensions unless otherwise specified.

Weight: 0.03 g

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

#### G3VM-41LR10



#### ■ Actual Mounting Pad Dimensions (Recommended Value, Top View)

#### G3VM-41LR10



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

Item		Symbol	Rating Unit		Measurement Conditions		
Input	LED forward current	I <sub>F</sub>	30	mA			
	LED forward current reduction rate	Δ I <sub>F</sub> /°C	-0.3	mA/°C	$T_a \ge 25^{\circ}C$		
	LED reverse voltage	$V_R$	5	V			
	Connection temperature	T <sub>j</sub>	125	°C			
Output	Load voltage (AC peak/DC)	V <sub>OFF</sub>	40	V			
	Continuous load current	Io	120	mA			
	ON current reduction rate	Δ I <sub>ON</sub> /°C	-1.2	mA/°C	$T_a \ge 25^{\circ}C$		
	Connection temperature	T <sub>j</sub>	125	°C			
Dielectric strength between input and output (See note 1.)		V <sub>I-O</sub>	1,500	V <sub>rms</sub>	AC for 1 min		
Ambient operating temperature		T <sub>a</sub>	-20 to +85	°C	With no icing or condensation		
Storage temperature		T <sub>stg</sub>	-40 to +125	°C	With no icing or condensation		
Soldering temperature			260	°C	10 s		

 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.

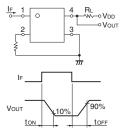
Note:

#### ■ Electrical Characteristics (Ta = 25°C)

	Item	Symbol	Mini- mum	Typical	Maxi- mum	Unit	Measurement conditions
Input	LED forward voltage	$V_{F}$	1.15	1.35	1.45	V	I <sub>F</sub> = 5 mA
	Reverse current	I <sub>R</sub>			10	μА	V <sub>R</sub> = 5 V
	Capacity between terminals	C <sub>T</sub>		70		pF	V = 0, f = 1 MHz
	Trigger LED forward current	I <sub>FT</sub>			3	mA	I <sub>O</sub> = 100 mA
Output	Maximum resistance with output ON	R <sub>ON</sub>		12	14	Ω	I <sub>F</sub> = 5 mA, I <sub>O</sub> = 120 mA, t < 1 s
	Current leakage when the relay is open	I <sub>LEAK</sub>		10	200	pA	$V_{OFF} = 35 \text{ V}, T_a = 25^{\circ}\text{C}$
	Capacity between terminals	C <sub>OFF</sub>		0.45	0.8	pF	V = 0, f = 100 MHz, t = < 1 s
Capacit	Capacity between I/O terminals			0.3		pF	f = 1 MHz, V <sub>s</sub> = 0 V
Insulation resistance between I/O terminals		R <sub>I-O</sub>	1,000			ΜΩ	$V_{I-O} = 500 \text{ VDC}, R_{oH} \le 60\%$
Turn-ON time		t <sub>ON</sub>		0.026	0.2	ms	$I_F = 5 \text{ mA}, R_L = 200 \Omega,$
Turn-OFF time		t <sub>OFF</sub>		0.14	0.3	ms	V <sub>DD</sub> = 10 V (See note 2.)

2. Turn-ON and Turn-OFF

Note:



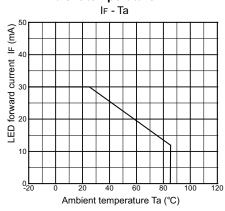
#### **■** Recommended Operating Conditions

Use the G3VM under the following conditions so that the Relay will operate properly.

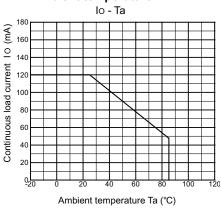
Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	V <sub>DD</sub>			32	V
Operating LED forward current	I <sub>F</sub>			20	mA
Continuous load current (AC peak/DC)	Io			120	mA
Operating temperature	T <sub>a</sub>	25		60	°C

#### **■** Engineering Data

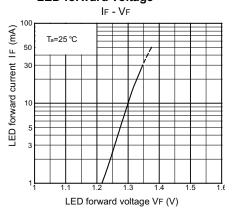
## LED forward current vs. Ambient temperature



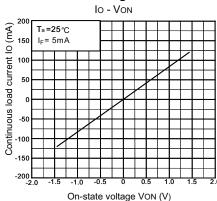
## Continuous load current vs. Ambient temperature



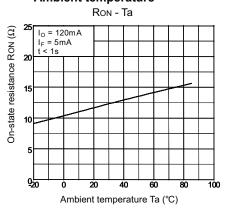
## LED forward current vs. LED forward voltage



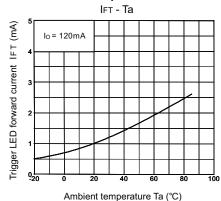
## Continuous load current vs. On-state voltage



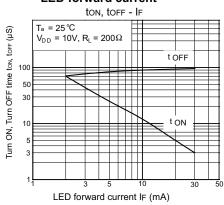
#### On-state resistance vs. Ambient temperature



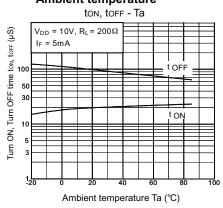
Trigger LED forward current vs. Ambient temperature



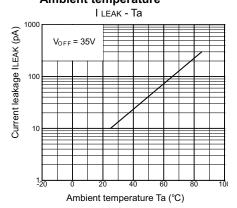
Turn ON, Turn OFF time vs. LED forward current



Turn ON, Turn OFF time vs.
Ambient temperature



Current leakage vs.
Ambient temperature





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