

# MOS FET Relays G3VM-21LR1

**World's Smallest SSOP Package MOS FET Relay with Low Output Capacitance and ON Resistance ( $C \times R = 5\text{pF} \cdot \Omega$ ) in a 20-V Load Voltage Model**

- ON resistance of 1  $\Omega$  (typical) suppresses output signal attenuation.
- RoHS Compliant.

**Note:** Information correct as of October, 2002, according to data obtained by OMRON.

### Application Examples

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



**NEW**  Approval pending

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

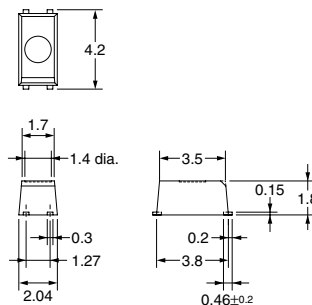
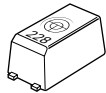
### List of Models

Contact form	Terminals	Load voltage (peak value)	Model	Number per tape
SPST-NO	Surface-mounting terminals	20 VAC	G3VM-21LR1	---
			G3VM-21LR1(TR)	1,500
			G3VM-21LR1(TR05)	500
			G3VM-21LR1(TR10)	1,000

### Dimensions

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

G3VM-21LR1



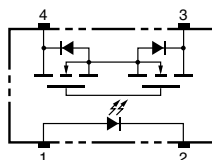
**Note:** The actual product is marked differently from the image shown here.

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

Weight: 0.03 g

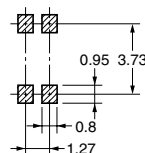
### Terminal Arrangement/Internal Connections (Top View)

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

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■ Absolute Maximum Ratings (Ta = 25°C)

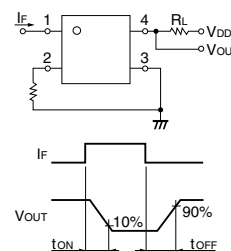
Item		Symbol	Rating	Unit	Measurement conditions
Input	LED forward current	$I_F$	50	mA	
	Repetitive peak LED forward current	$I_{FP}$	1	A	100 $\mu$ s pulses, 100 pps
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.5	mA/°C	Ta $\geq$ 25°C
	LED reverse voltage	$V_R$	5	V	
	Connection temperature	$T_j$	125	°C	
Output	Output dielectric strength	$V_{OFF}$	20	V	
	Continuous load current	$I_O$	450	mA	
	ON current reduction rate	$\Delta I_{ON}/^\circ\text{C}$	-4.5	mA/°C	Ta $\geq$ 25°C
	Connection temperature	$T_j$	125	°C	
Dielectric strength between input and output (See note 1.)		$V_{I-O}$	1,500	Vrms	AC for 1 min
Operating temperature		$T_a$	-20 to +85	°C	With no icing or condensation
Storage temperature		$T_{stg}$	-40 to +125	°C	With no icing or condensation
Soldering temperature (10 s)		---	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	Minimum	Typical	Maximum	Unit	Measurement conditions
Input	LED forward voltage	$V_F$	1.0	1.15	1.3	V	$I_F = 10$ mA
	Reverse current	$I_R$	---	---	10	$\mu$ A	$V_R = 5$ V
	Capacity between terminals	$C_T$	---	15	---	pF	$V = 0$ , $f = 1$ MHz
	Trigger LED forward current	$I_{FT}$	---	---	4	mA	$I_O = 100$ mA
Output	Maximum resistance with output ON	$R_{ON}$	---	0.8	1.2	$\Omega$	$I_F = 5$ mA, $I_O = 450$ mA, $t = 10$ ms
	Current leakage when the relay is open	$I_{LEAK}$	---	---	1.0	nA	$V_{OFF} = 20$ V, Ta = 50°C
	Capacity between terminals	$C_{OFF}$	---	5.0	12.0	pF	$V = 0$ , $f = 100$ MHz, $t < 1$ s
Capacity between I/O terminals		$C_{I-O}$	---	0.8	---	pF	$f = 1$ MHz, $V_s = 0$ V
Insulation resistance		$R_{I-O}$	1,000	---	---	M $\Omega$	$V_{I-O} = 500$ VDC, RoH $\leq$ 60%
Turn-ON time		tON	---	---	0.5	ms	$I_F = 10$ mA, $R_L = 200$ $\Omega$ , $V_{DD} = 20$ V (See note 2.)
Turn-OFF time		tOFF	---	---	0.5	ms	

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



■ Recommended Operating Conditions

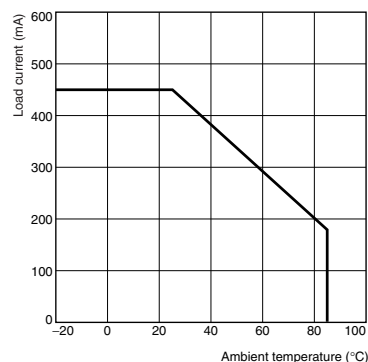
Use the G3VM under the following conditions so that the Relay will operate properly.

Item	Symbol	Minimum	Typical	Maximum	Unit
Output dielectric strength	$V_{DD}$	---	---	20	V
Operating LED forward current	$I_F$	10	---	30	mA
Continuous load current	$I_O$	---	---	450	mA
Operating temperature	$T_a$	25	---	60	°C

■ Engineering Data

Load Current vs. Ambient Temperature

G3VM-21LR1



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