

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 Ω (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.

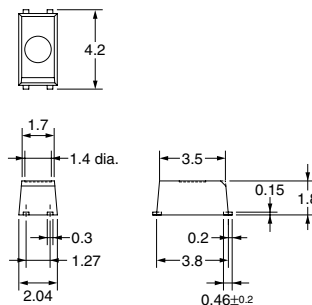
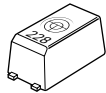
List of Models

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



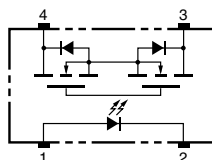
Note: A tolerance of ± 0.1 mm applies to all dimensions unless otherwise specified.

Weight: 0.03 g

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

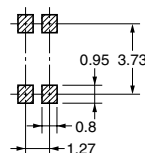
Terminal Arrangement/Internal Connections (Top View)

G3VM-21LR1



Actual Mounting Pad Dimensions (Recommended Value, Top View)

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■ Absolute Maximum Ratings (Ta = 25°C)

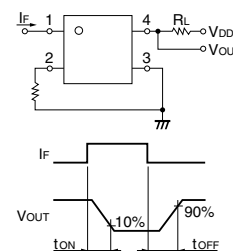
Item		Symbol	Rating	Unit	Measurement conditions
Input	LED forward current	I_F	50	mA	
	Repetitive peak LED forward current	I_{FP}	1	A	100 μ s pulses, 100 pps
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.5	mA/ $^\circ\text{C}$	Ta \geq 25°C
	LED reverse voltage	V_R	5	V	
	Connection temperature	T_j	125	$^\circ\text{C}$	
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/ $^\circ\text{C}$	Ta \geq 25°C
	Connection temperature	T_j	125	$^\circ\text{C}$	
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	$^\circ\text{C}$	With no icing or condensation
Storage temperature		T_{stg}	-40 to +125	$^\circ\text{C}$	With no icing or condensation
Soldering temperature (10 s)		---	260	$^\circ\text{C}$	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	μA	$V_R = 5$ 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	Ω	$I_F = 5$ 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 Ω	$V_{I-O} = 500$ VDC, RoH \leq 60%
Turn-ON time		tON	---	---	0.5	ms	$I_F = 10$ mA, $R_L = 200$ Ω , $V_{DD} = 20$ V (See note 2.)
Turn-OFF time		tOFF	---	---	0.5	ms	

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



■ Recommended Operating Conditions

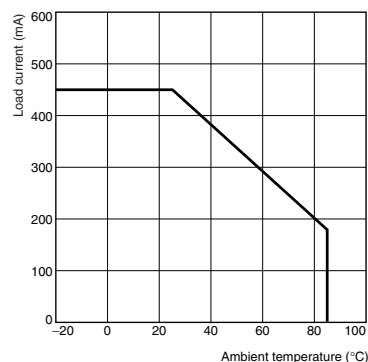
Use the G3VM under the following conditions so that the Relay will operate properly.

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	$^\circ\text{C}$

■ Engineering Data

Load Current vs. Ambient Temperature

G3VM-21LR1



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