

MOS FET RELAYS

G3VM-21LR10

SSOP Package MOS FET Relay with Low Leakage Current, Output Capacitance and ON Resistance ($C \times R = 2.4 \text{ pF} \cdot \Omega$) in a 20-V Load Voltage Model.

- Output capacitance of 0.8 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.), turn-off time = 0.045 ms (typ.)
- RoHS compliant

■ **Application Examples**

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



NEW

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

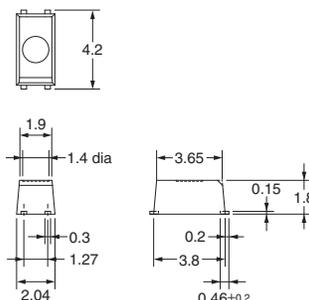
■ **List of Models**

Contact form	Terminals	Load voltage (peak value)	Model	Number per tape
SPST-NO	Surface-mounting terminals	20 VAC	G3VM-21LR10	---
			G3VM-21LR10(TR05)	500
			G3VM-21LR10(TR)	1,500

■ **Dimensions**

Note: All units are in millimeters unless otherwise indicated.

G3VM-21LR10



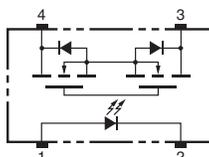
Note: The actual product is marked differently from the image shown here.

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

Weight: 0.03 g

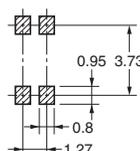
■ **Terminal Arrangement/Internal Connections (Top View)**

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

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■ Absolute Maximum Ratings (Ta = 25°C)

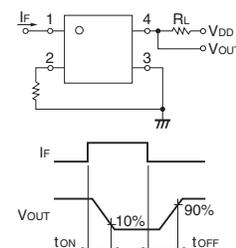
Item	Symbol	Rating	Unit	Measurement Conditions	
Input	LED forward current	I_F	30	mA	
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.3	mA/°C	$T_a \geq 25^\circ\text{C}$
	LED reverse voltage	V_R	5	V	
	Connection temperature	T_J	125	°C	
Output	Load voltage (AC peak/DC)	V_{OFF}	20	V	
	Continuous load current	I_O	200	mA	
	ON current reduction rate	$\Delta I_{ON}/^\circ\text{C}$	-2.0	mA/°C	$T_a \geq 25^\circ\text{C}$
	Connection temperature	T_J	125	°C	
Dielectric strength between input and output (See note 1.)	V_{I-O}	1,500	V_{rms}	AC for 1 min	
Ambient 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	---	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	1.15	1.35	1.45	V	$I_F = 5\text{ mA}$
	Reverse current	I_R	---	---	10	μA	$V_R = 5\text{ V}$
	Capacity between terminals	C_T	---	70	---	pF	$V = 0, f = 1\text{ MHz}$
	Trigger LED forward current	I_{FT}	---	---	3	mA	$I_O = 100\text{ mA}$
Output	Maximum resistance with output ON	R_{ON}	---	3	5	Ω	$I_F = 5\text{ mA}, I_O = 200\text{ mA}, t < 1\text{ s}$
	Current leakage when the relay is open	I_{LEAK}	---	10	200	pA	$V_{OFF} = 20\text{ V}, T_a = 25^\circ\text{C}$
	Capacity between terminals	C_{OFF}	---	0.8	1.1	pF	$V = 0, f = 100\text{ MHz}$
Capacity between I/O terminals	C_{I-O}	---	0.3	---	pF	$f = 1\text{ MHz}, V_s = 0\text{ V}$	
Insulation resistance between I/O terminals	R_{I-O}	1,000	---	---	$M\Omega$	$V_{I-O} = 500\text{ VDC}, R_{OH} \leq 60\%$	
Turn-ON time	t_{ON}	---	0.026	0.2	ms	$I_F = 5\text{ mA}, R_L = 200\ \Omega, V_{DD} = 10\text{ V}$ (See note 2.)	
Turn-OFF time	t_{OFF}	---	0.045	0.2	ms		

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



■ Recommended Operating Conditions

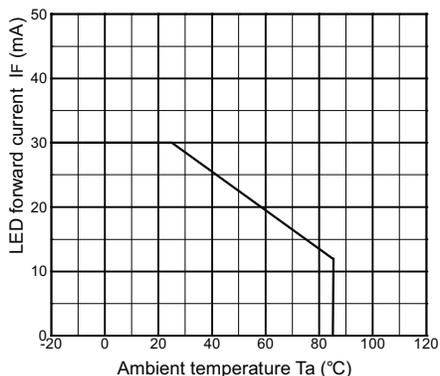
Use the G3VM under the following conditions so that the Relay will operate properly.

Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	V_{DD}	---	---	20	V
Operating LED forward current	I_F	---	---	20	mA
Continuous load current (AC peak/DC)	I_O	---	---	200	mA
Operating temperature	T_a	25	---	60	°C

■ Engineering Data

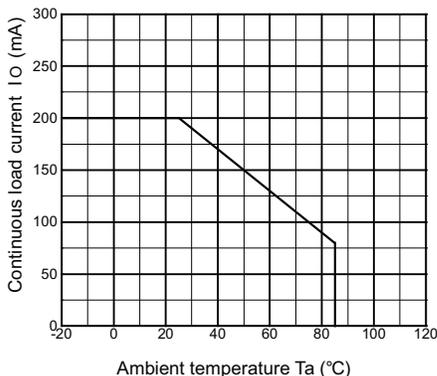
LED forward current vs. Ambient temperature

$I_F - T_a$



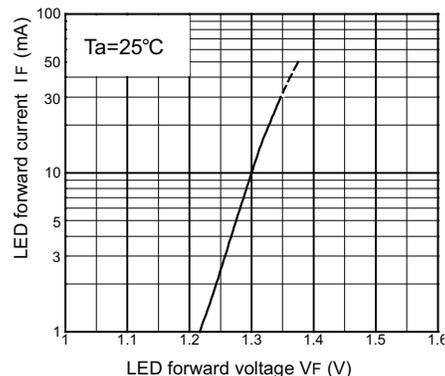
Continuous load current vs. Ambient temperature

$I_O - T_a$



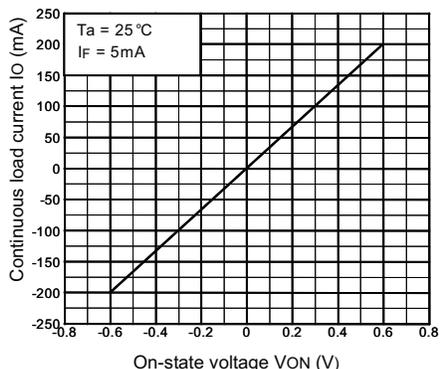
LED forward current vs. LED forward voltage

$I_F - V_F$



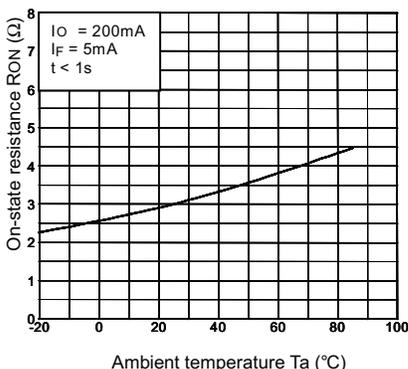
Continuous load current vs. On-state voltage

$I_O - V_{ON}$



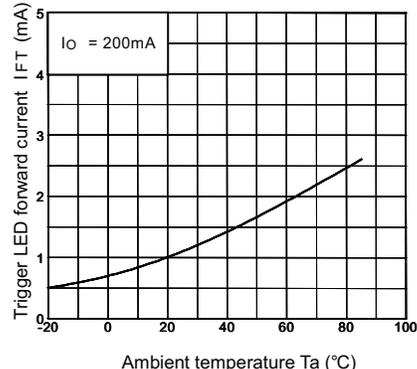
On-state resistance vs. Ambient temperature

$R_{ON} - T_a$



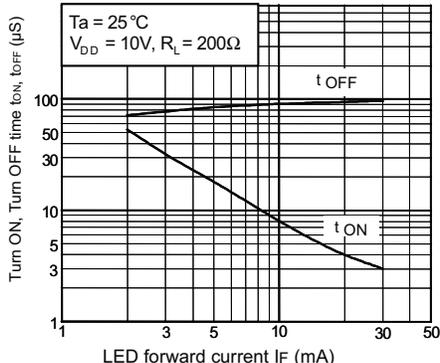
Trigger LED forward current vs. Ambient temperature

$I_{FT} - T_a$



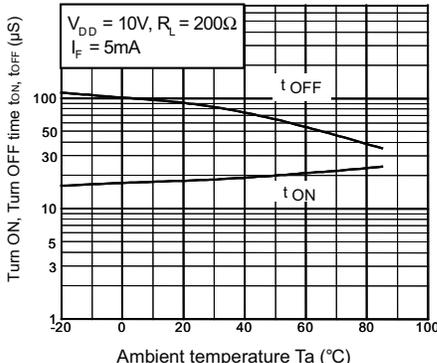
Turn ON, Turn OFF time vs. LED forward current

$t_{ON}, t_{OFF} - I_F$



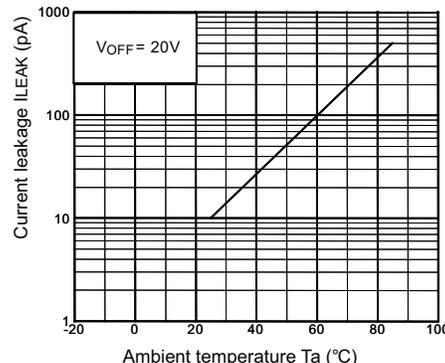
Turn ON, Turn OFF time vs. Ambient temperature

$t_{ON}, t_{OFF} - T_a$



Current leakage vs. Ambient temperature

$I_{LEAK} - T_a$



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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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