MOS FET Relays
G3VM-21LR

World's Smallest SSOP Package MOS FET Relay* with Low Output Capacitance and ON Resistance (C×R = 5pF• Ω) in a 20-V Load Voltage Model

- Output capacitance of 1 pF (typical) allows high frequency applications.
- RoHS Compliant.

*Information correct as of May, 2007, according to data obtained by OMRON.

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

■ Application Examples

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

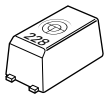
■ List of Models

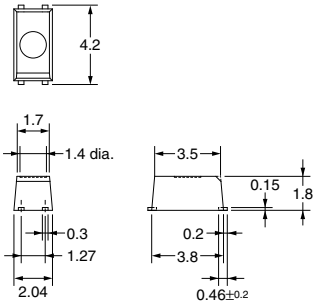
Contact form	Terminals	Load voltage (peak value)	Model	Number per tape
SPST-NO	Surface-mounting terminals	20 VAC	**G3VM-21LR**	---
			G3VM-21LR(TR)	1,500
			G3VM-21LR(TR05)	500
			G3VM-21LR(TR10)	1,000

■ Dimensions

Note: All units are in millimeters unless otherwise indicated.

G3VM-21LR





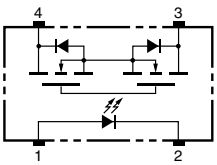
Note: The actual product is marked differently from the image shown here.

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

Weight: 0.03 g

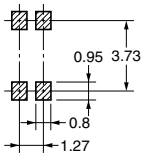
■ Terminal Arrangement/Internal Connections (Top View)

G3VM-21LR



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

G3VM-21LR



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■ Absolute Maximum Ratings (Ta = 25°C)

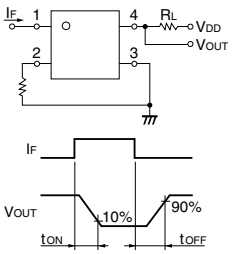
Item		Symbol	Rating	Unit	Measurement conditions
Input	LED forward current	I_F	50	mA	
	Repetitive peak LED forward current	I_{FP}	1	A	100 μs pulses, 100 pps
	LED forward current reduction rate	ΔI_F/°C	–0.5	mA/°C	$T_a \geq 25$°C
	LED reverse voltage	V_R	5	V	
	Connection temperature	T_j	125	°C	
Output	Load voltage (AC peak/DC)	V_{OFF}	20	V	
	Continuous load current	I_O	160	mA	
	ON current reduction rate	ΔI_{ON}/°C	–1.6	mA/°C	$T_a \geq 25$°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
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	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}	---	5	8	Ω	I_F = 5 mA, I_O = 160 mA, t = 10 ms
	Current leakage when the relay is open	I_{LEAK}	---	0.2	1.0	nA	V_{OFF} = 20 V, Ta = 50°C
	Capacity between terminals	C_{OFF}	---	1.0	2.5	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	---	---	MΩ	V_{I-O} = 500 VDC, RoH ≤ 60%
Turn-ON time		t_{ON}	---	0.06	0.5	ms	I_F = 10 mA, R_L = 200 Ω, V_{DD} = 20 V (See note 2.)
Turn-OFF time		t_{OFF}	---	0.12	0.5	ms	

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



■ Recommended Operating Conditions

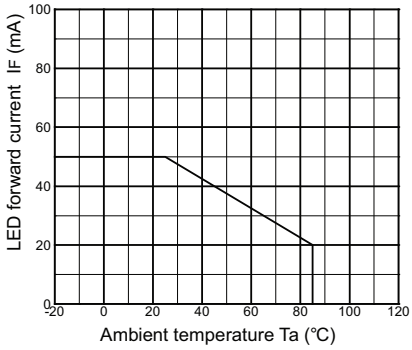
Use the G3VM under the following conditions so that the Relay will operate properly.

Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	V_{DD}	---	---	20	V
Operating LED forward current	I_F	7	---	30	mA
Continuous load current (AC peak/DC)	I_O	---	---	160	mA
Operating temperature	T_a	25	---	60	°C

■ Engineering Data

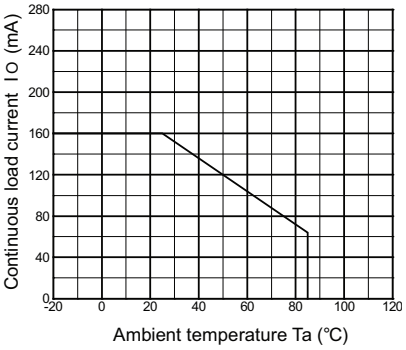
LED forward current vs. Ambient temperature

I_F - Ta



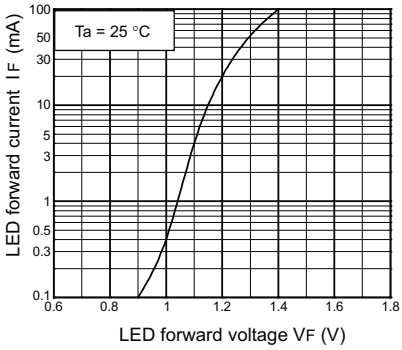
Continuous load current vs. Ambient temperature

I_O - Ta



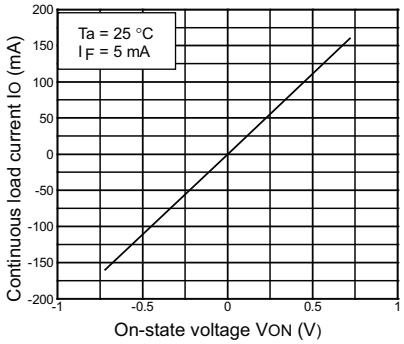
LED forward current vs. LED forward voltage

I_F - V_F



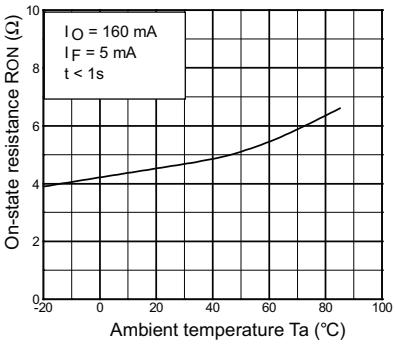
Continuous load current vs. On-state voltage

I_O - V_{ON}



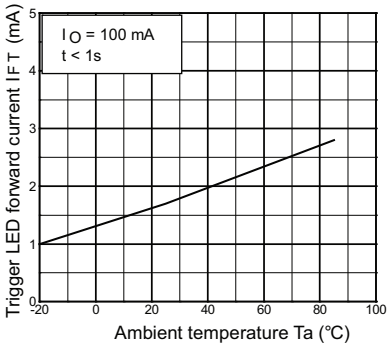
On-state resistance vs. Ambient temperature

R_{ON} - Ta



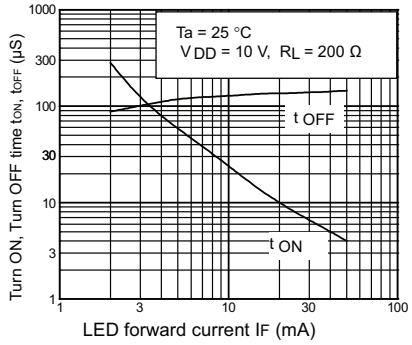
Trigger LED forward current vs. Ambient temperature

I_{FT} - Ta



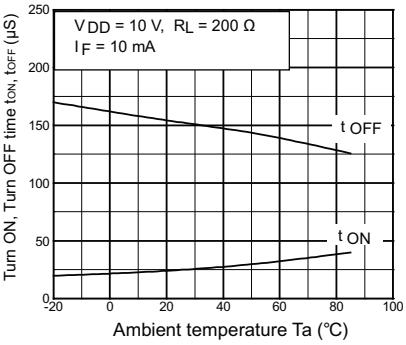
Turn ON, Turn OFF time vs. LED forward current

t_{ON}, t_{OFF} - I_F



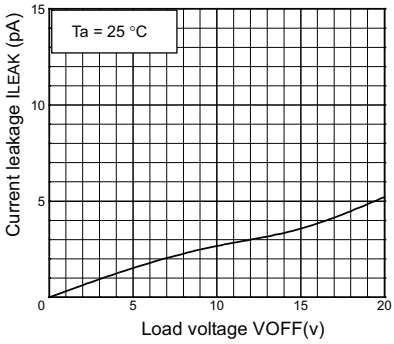
Turn ON, Turn OFF time vs. Ambient temperature

t_{ON}, t_{OFF} - Ta



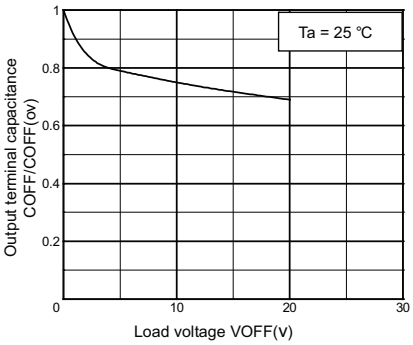
Current leakage vs. Load voltage

I_{LEAK} – V_{OFF}



Output terminal capacitance COFF/COFF(ov) vs. Load voltage

C_{OFF} - V_{OFF}



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To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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55 E. Commerce Drive, Suite B
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