

MOS FET Relays G3VM-401B/E

Analog-switching MOS FET Relays with Dielectric Strength of 2.5 kVAC between I/O Using Optical Isolation

- Switches minute analog signals.
- Leakage current of 1 μ A max. (0.8 nA typ.) when relay is open.
- Upgraded G3VM-4N Series.
- RoHS Compliant.

Application Examples

- Electronic automatic exchange systems
- Measurement devices
- FA systems

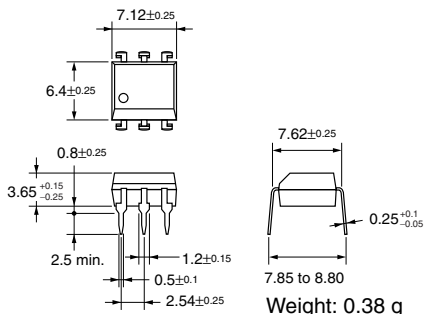
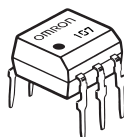
List of Models

Contact form	Terminals	Load voltage (peak value)	Model	Number per stick	Number per tape
SPST-NO	PCB terminals	400 VAC	G3VM-401B	50	---
	Surface-mounting terminals		G3VM-401E		
				G3VM-401E(TR)	---

Dimensions

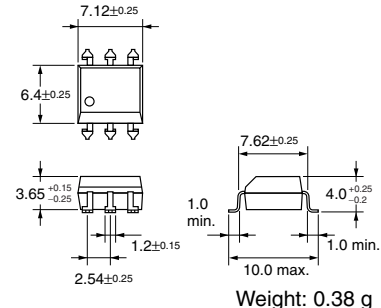
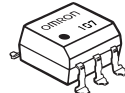
Note: All units are in millimeters unless otherwise indicated.

G3VM-401B



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

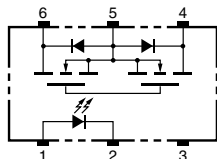
G3VM-401E



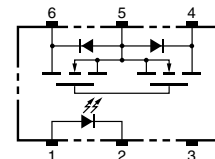
Note: The actual product is marked differently from the image shown here.

Terminal Arrangement/Internal Connections (Top View)

G3VM-401B

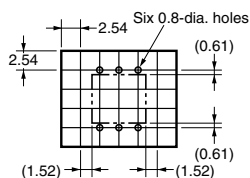


G3VM-401E



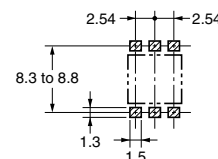
PCB Dimensions (Bottom View)

G3VM-401B



Actual Mounting Pad Dimensions (Recommended Value, Top View)

G3VM-401E

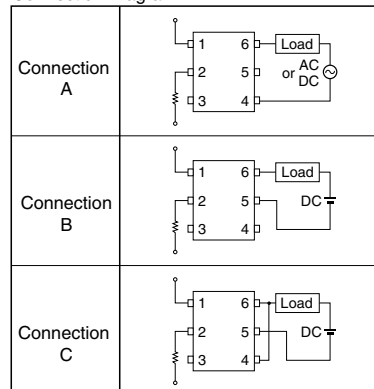


■ Absolute Maximum Ratings (Ta = 25°C)

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/°C	Ta \geq 25°C	
	LED reverse voltage	V_R	5	V		
	Connection temperature	T_J	125	°C		
Output	Load voltage (AC peak/DC)	V_{OFF}	400	V		
	Continuous load current	Connection A	I_O	120	mA	
		Connection B		120		
		Connection C		240		
	ON current reduction rate	Connection A	$\Delta I_{ON}/^\circ\text{C}$	-1.2	mA/°C	Ta \geq 25°C
		Connection B		-1.2		
		Connection C		-2.4		
Connection temperature	T_J	125	°C			
Dielectric strength between input and output (See note 1.)		V_{I-O}	2,500	V_{rms}	AC for 1 min	
Operating temperature		T_a	-40 to +85	°C	With no icing or condensation	
Storage temperature		T_{stg}	-55 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.

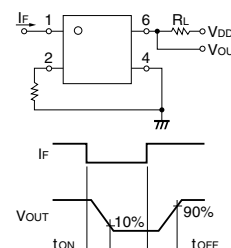
Connection Diagram



■ 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	μ A	$V_R = 5$ V	
	Capacity between terminals	C_T	---	30	---	pF	V = 0, f = 1 MHz	
	Trigger LED forward current	I_{FT}	---	1	3	mA	$I_O = 120$ mA	
Output	Maximum resistance with output ON	Connection A	R_{ON}	---	17	35	Ω	$I_F = 5$ mA, $I_O = 120$ mA
		Connection B		---	11	20	Ω	$I_F = 5$ mA, $I_O = 120$ mA
		Connection C		---	6	10	Ω	$I_F = 5$ mA, $I_O = 240$ mA
Current leakage when the relay is open		I_{LEAK}	---	0.0008	1.0	μ A	$V_{OFF} = 350$ V	
Capacity between terminals A Connection		C_{OFF}	---	40	---	pF	V = 0, f = 1 MHz	
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, $R_{OH} \leq 60\%$	
Turn-ON time		t_{ON}	---	0.3	1.0	ms	$I_F = 5$ mA, $R_L = 200$ Ω , $V_{DD} = 20$ V (See note 2.)	
Turn-OFF time		t_{OFF}	---	0.1	1.0	ms		

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



■ Recommended Operating Conditions

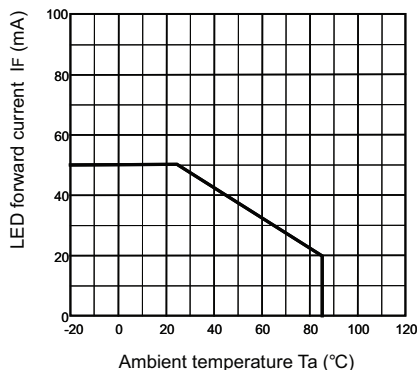
Use the G3VM under the following conditions so that the Relay will operate properly.

Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	V_{DD}	---	---	320	V
Operating LED forward current	I_F	5	7.5	25	mA
Continuous load current (AC peak/DC)	I_O	---	---	120	mA
Operating temperature	T_a	-20	---	65	°C

■ Engineering Data

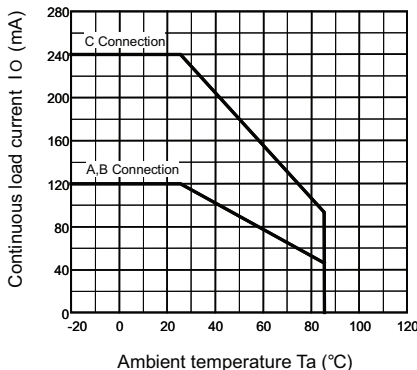
LED forward current vs. Ambient temperature

$I_F - T_a$



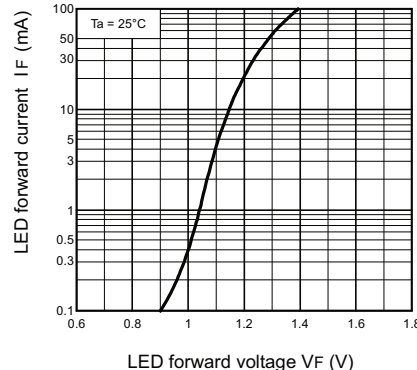
Continuous load current vs. Ambient temperature

$I_O - T_a$



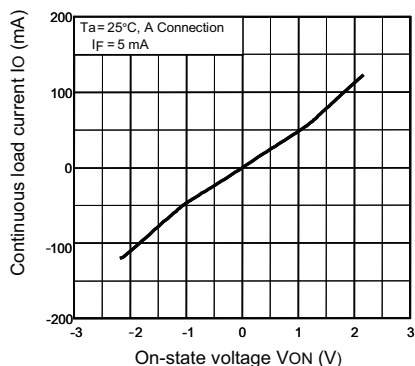
LED forward current vs. LED forward voltage

$I_F - V_F$



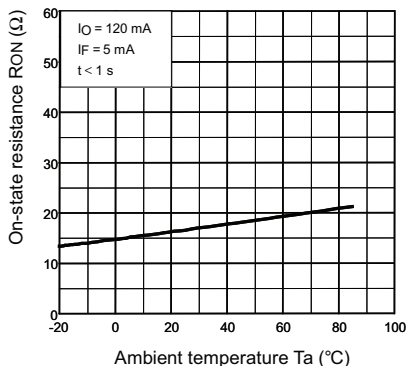
Continuous load current vs. On-state voltage

$I_O - V_{ON}$



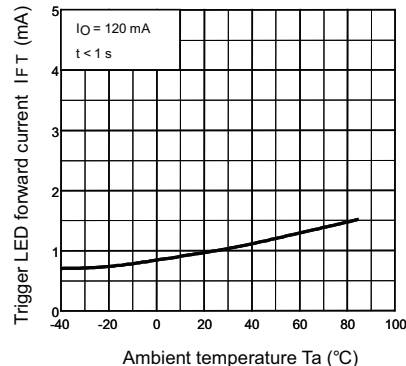
On-state resistance vs. Ambient temperature

$R_{ON} - T_a$



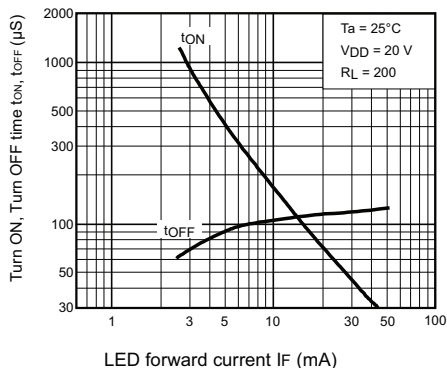
Trigger LED forward current vs. Ambient temperature

$I_{FT} - T_a$



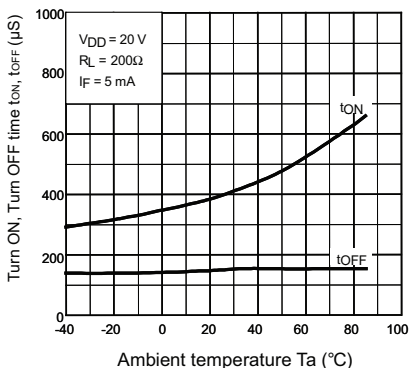
Turn ON, Turn OFF time vs. LED forward current

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



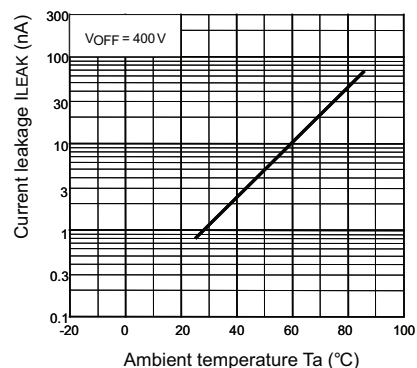
Turn ON, Turn OFF time vs. Ambient temperature

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



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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