

# MOS FET Relays G3VM-402J

## Analog-Switching MOS FET Relays with 400-V Load Voltage

- Two channels and an 8-pin SOP package included in a 400-V load voltage series.
- Continuous load current of 120 mA.
- Dielectric strength of 1,500 Vrms between I/O.
- RoHS Compliant.

### Application Examples

- Broadband systems
- Measurement devices and Data loggers
- Amusement machines

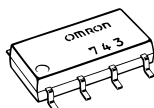
### List of Models

Contact form	Terminals	Load voltage (peak value)	Model	Number per stick	Number per tape
DPST-NO	Surface-mounting terminals	400 VAC	G3VM-402J	50	---
			G3VM-402J(TR)	---	2,500

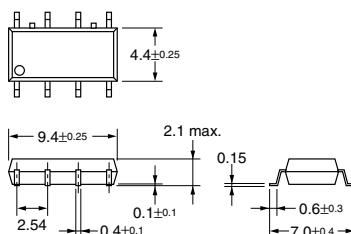
### Dimensions

Note: All units are in millimeters unless otherwise indicated.

#### G3VM-402J



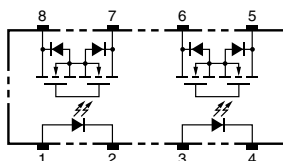
Note: The actual product is marked differently from the image shown here.



Weight: 0.2 g

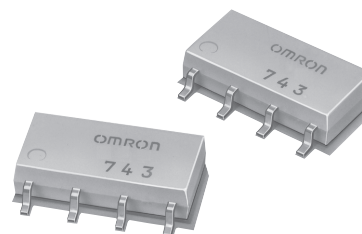
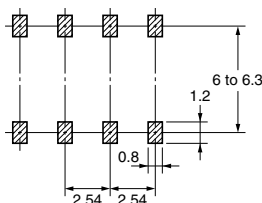
### Terminal Arrangement/Internal Connections (Top View)

#### G3VM-402J



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

#### G3VM-402J



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

■ Absolute Maximum Ratings (Ta = 25°C)

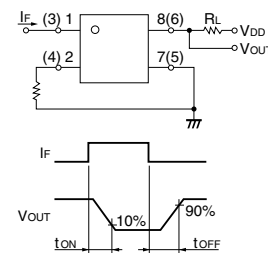
Item	Symbol	Rating	Unit	Measurement conditions	
Input	LED forward current	$I_F$	50	mA	
	Repetitive peak LED forward current	$I_{FP}$	1	A	100 $\mu$ s pulses, 100 pps
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.5	mA/°C	$T_a \geq 25^\circ\text{C}$
	LED reverse voltage	$V_R$	5	V	
	Connection temperature	$T_j$	125	°C	
Output	Load voltage (AC peak/DC)	$V_{OFF}$	400	V	
	Continuous load current	$I_O$	120	mA	
	ON current reduction rate	$\Delta I_{ON}/^\circ\text{C}$	-1.2	mA/°C	$T_a \geq 25^\circ\text{C}$
Dielectric strength between input and output (See note 1.)	$V_{I-O}$	1,500	$V_{rms}$	AC for 1 min	
Operating temperature	$T_a$	-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.

■ 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	$I_F = 10 \text{ mA}$
	Reverse current	$I_R$	---	---	10	$\mu\text{A}$	$V_R = 5 \text{ V}$
	Capacity between terminals	$C_T$	---	30	---	pF	$V = 0, f = 1 \text{ MHz}$
	Trigger LED forward current	$I_{FT}$	---	1	3	mA	$I_O = 120 \text{ mA}$
Output	Maximum resistance with output ON	$R_{ON}$	---	17	35	$\Omega$	$I_F = 5 \text{ mA}, I_O = 120 \text{ mA}$
	Current leakage when the relay is open	$I_{LEAK}$	---	0.003	1.0	$\mu\text{A}$	$V_{OFF} = 400 \text{ V}$
	Capacity between terminals	$C_{OFF}$	---	70	---	pF	$V = 0, f = 1 \text{ MHz}$
Capacity between I/O terminals	$C_{I-O}$	---	0.8	---	pF	$f = 1 \text{ MHz}, V_s = 0 \text{ V}$	
Insulation resistance	$R_{I-O}$	1,000	---	---	$M\Omega$	$V_{I-O} = 500 \text{ VDC}, R_{oh} \leq 60\%$	
Turn-ON time	$t_{ON}$	---	0.3	1	ms	$I_F = 10 \text{ mA}, R_L = 200 \Omega, V_{DD} = 20 \text{ V}$ (See note 2.)	
Turn-OFF time	$t_{OFF}$	---	0.1	1	ms		

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



■ Recommended Operating Conditions

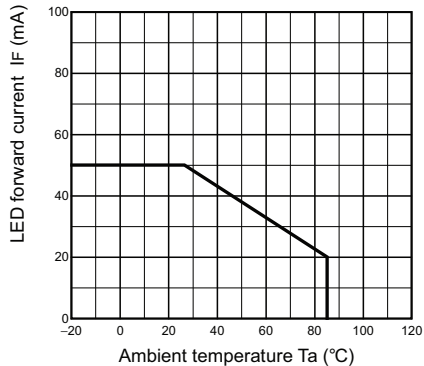
Use the G3VM under the following conditions so that the Relay will operate properly.

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

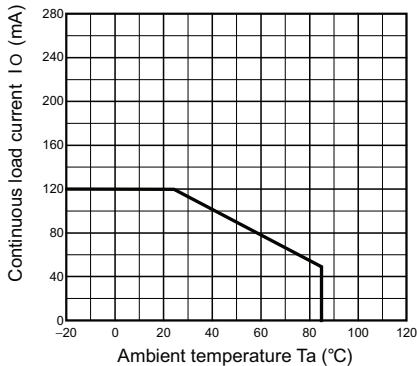
LED forward current vs. Ambient temperature

$I_F - T_a$



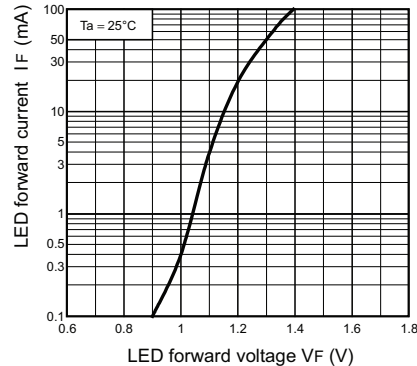
Continuous load current vs. Ambient temperature

$I_O - T_a$



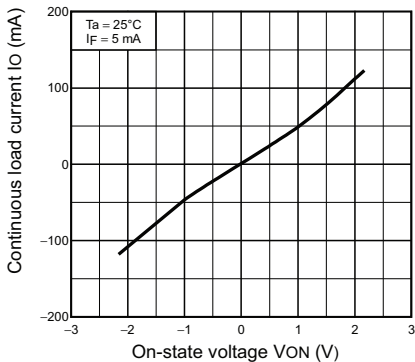
LED forward current vs. LED forward voltage

$I_F - V_F$



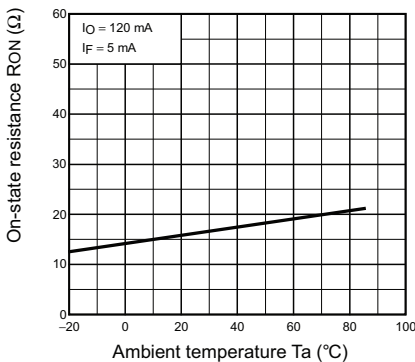
Continuous load current vs. On-state voltage

$I_O - V_{ON}$



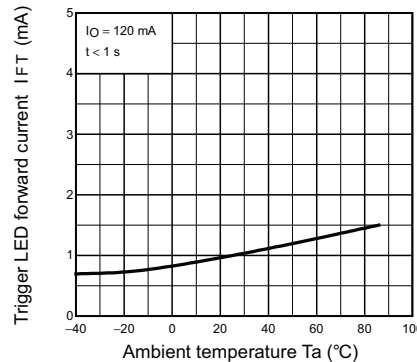
On-state resistance vs. Ambient temperature

$R_{ON} - T_a$



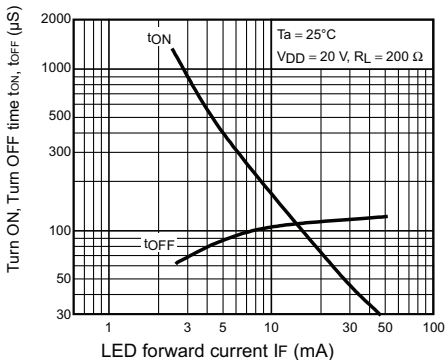
Trigger LED forward current vs. Ambient temperature

$I_{FT} - T_a$



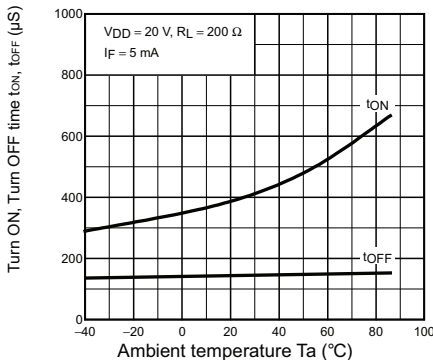
Turn ON, Turn OFF time vs. LED forward current

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



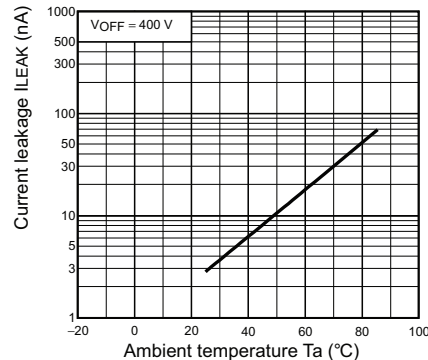
Turn ON, Turn OFF time vs. Ambient temperature

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



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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