OMRON

MOS FET Relay

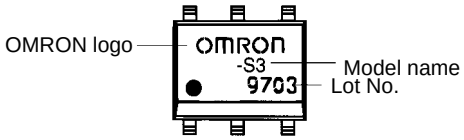
G3VM-S2/S3

Relay Incorporating a MOS FET Optically Coupled with an Infrared LED in a Miniature Out-line Package

- MOS FET of the output circuit has a high dielectric strength.
- Ideal replacement for the dial-pulse relay or hook relay of each modem or facsimile machine.
- Ideal for application to the line interface blocks of PBX and telephone exchange systems.
- Thin, flat, and extremely compact.
- Can be applied to hybrid IC circuits and card-type modems conforming to PCMCIA standards to make them even more compact and lightweight.
- Approved standards : UL1577 (File No. E80555)

Ordering Information

■ Appearance



Note: "G3VM" is not printed on the actual product

Contact form	Terminals	Load voltage (peak value)	Model	Number per stick	Number per tape
SPST-NO	Surface-mounting terminals (see note)	350 VAC	G3VM-S2	100	2,500
			G3VM-S3	75	

Application Examples

- PBX subscriber interfaces
- Multi-functional telephones
- PC card modems
- Card-type modems and fax modems
- Gauging systems

Specifications

■ General Specifications

- Output dielectric strength: 350 V min.
- Trigger LED current: 3 mA max.
- Continuous load current: 120 mA max. (connected to normally open contact)
- Output ON resistance: 35 Ω max. (connected to normally open contact)
- Insulation resistance between I/O pins: 1,500 V_{rms} min.

■ Absolute Maximum Ratings (Ta = 25°C)

<G3VM-S2>

Item		Symbol	Rating	Unit
Input	**LED forward current**	I_F	50	mA
	Repetitive peak LED forward current (Duty: 1% max.; pulse-width: 100 μs max.)	I_{FP}	1	A
	LED reverse voltage	V_R	5	V
Output	**Output dielectric strength**	V_{BO}	DC or AC peak value: –350 to 350	V
			DC: 0 to 350	
	Continuous load current (see note 1)	I_O	120	mA
	Dielectric strength between I/O terminals (AC for 1 min) (see note 2)	V_{I-O}	1,500	V_{rms}
Operating temperature (with no icing or condensation)		T_a	–40 to 85	°C
Storage temperature (with no icing or condensation)		T_{stg}	–55 to 125	°C
Soldering temperature (10 s)		---	260	°C

Note: 1. The output load current varies depending on the ambient temperature. Refer to *Engineering Data*.

2. The dielectric strength was checked by applying voltage between each pairing of input and output pins.

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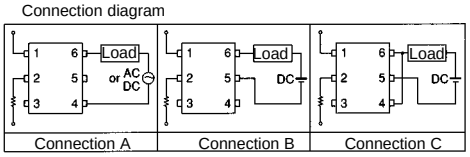
Item			Symbol	Rating	Unit
Input	**LED forward current**		I_F	50	mA
	LED forward current reduction rate (Ta≧25°C)		ΔI_F/°C	–0.5	mA/°C
	Repetitive peak LED forward current (100 μs pulse, 100 pps)		I_{FP}	1	A
	LED reverse voltage		V_R	5	V
	Input permissible loss		Pin	50	mW
	Connection temperature		T_j	125	°C
Output	**Load voltage (AC peak)**		V_{OFF}	350	V
	Continuous load current (see note 1)	**Connection A**	I_O	120	mA
		Connection B			
		Connection C			
	Peak load current		I_{peak}	0.35	A
	Output permissible loss		P_{out}	454	mW
	ON current reduction rate	**Connection A**	ΔI_{ON}/°C	–1.2	mA/°C
		Connection B			
		Connection C			
Total permissible loss			P_T	504	mW
Dielectric strength between I/O terminals (AC for 1 min) (see note 2)			V_{I-O}	1,500	V_{rms}
Insulation resistance (V_S = 500; operating ambient humidity ≦ 60%)			R_{I-O}	5×10^{10}	Ω
Storage temperature			T_{stg}	–55 to +125	°C
Operating temperature			T_a	–40 to +85	°C

Note: 1. The output load current varies depending on the ambient temperature. Refer to *Engineering Data*.

2. The dielectric strength was checked for each connection by applying a voltage between each pairing of pins 1, 2, and 3 and pins 4, 5, and 6.

Connection diagram

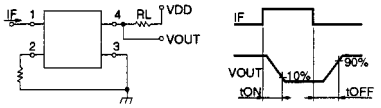


■ Electrical Characteristics (Ta = 25°C)

<G3VM-S2>

Item	Symbol	Minimum	Typical	Maximum	Unit	Measurement conditions
Output ON resistance	R_{ON}	---	---	35	Ω	I_F=5 mA, I_{ON}=120 mA
Current leakage when the relay is closed	I_{LEAK}	---	---	1.0	μA	V_{ON}=V_{BO}
LED forward current	V_F	---	---	1.3	V	I_F=10 mA
Capacity between input and output terminals	C_{I-O}	---	0.8	---	pF	f=1 MHz
Insulation resistance between I/O terminals	R_{I-O}	5 x 10^{10}	---	---	Ω	V_{I-O}=500 VDC
Operating time	T_{ON}	---	---	1	ms	I_F=5 mA, V_{DD}=20 V, R_L=200 Ω (see note)
Release time	T_{OFF}	---	---	1	ms	I_F=5 mA, V_{DD}=20 V, R_L=200 Ω (see note)

Note: Switching Time Measuring Circuit



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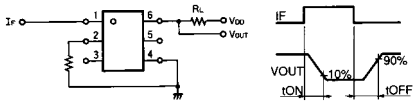
Item			Symbol	Minimum	Typical	Maximum	Unit	Measurement conditions
Input	**LED forward voltage**		V_F	1.0	1.15	1.3	V	I_F=10 mA
	Reverse current		I_R	---	---	10	μA	V_R=5 V
	Capacity between terminals		C_T	---	30	---	pF	V=0, f=1MHZ
Output	**Maximum resistance with output ON**	**Connection A**	R_{ON}	---	22	35	Ω	I_{ON}=120 mA, I_F=5 mA
		Connection B		---	---	25		
		Connection C		---	---	15		
	Current leakage when the relay is open		I_{LEAK}	---	---	1	μA	V_{OFF}=350 V
Operating time			T_{ON}	---	0.3	1	ms	R_L=200 Ω V_{DD}=20 V, I_F=5 mA (see note)
Release time			T_{OFF}	---	0.1	1	ms	
Floating capacity between I/O terminals			C_{I-O}	---	0.8	---	pF	V_S=0, f=1 MH_Z

Note: Switching Time Measuring Circuit



■ Recommended Operating Conditions

<G3VM-S2>

Item	Symbol	Minimum	Typical	Maximum	Unit
Operating voltage	V_{DD}	---	---	280	V
Forward current	I_F	5	7.5	25	mA
ON current	I_{ON}	---	---	100	mA
Operating temperature	T_{opr}	–20	---	65	°C

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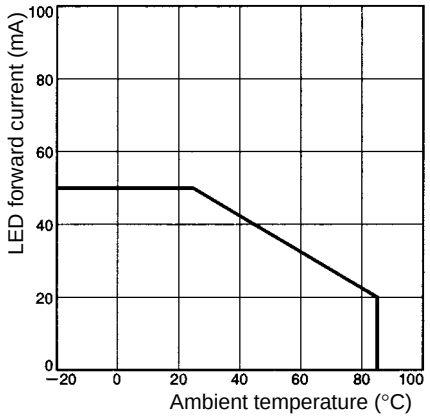
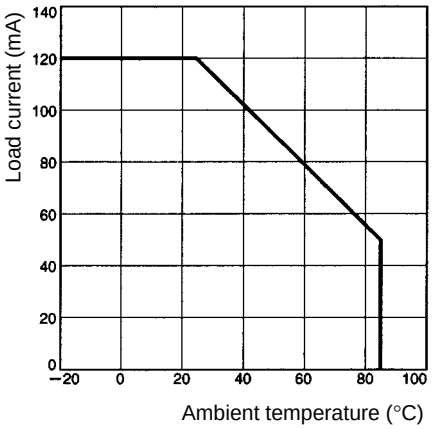
Item	Symbol	Minimum	Typical	Maximum	Unit
Operating voltage	V_{DD}	---	---	280	V
Forward current	I_F	5	10	25	mA
Continuous load current	I_O	---	---	100	mA
Operating temperature	T_{opr}	–20	---	65	°C

Engineering Data

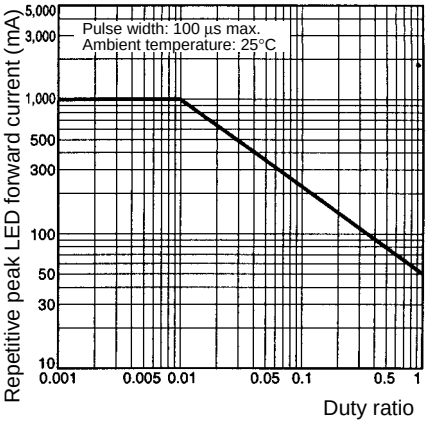
LED Forward Current vs. Ambient Temperature G3VM-S2, G3VM-S3



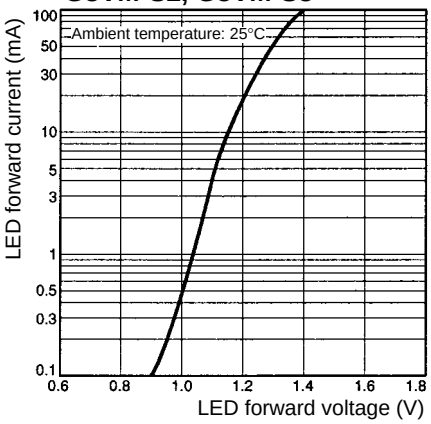
Load Current vs. Ambient Temperature G3VM-S2, G3VM-S3



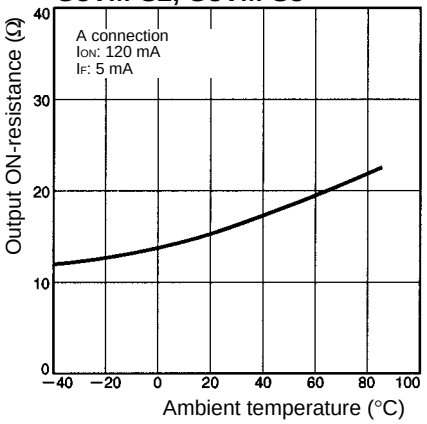
Repetitive Peak LED Forward Current vs. Duty Ratio G3VM-S2, G3VM-S3



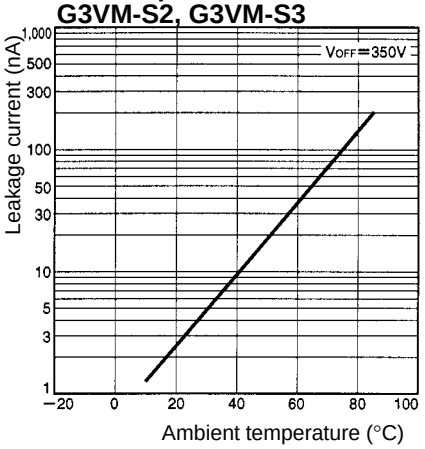
LED Forward Current vs. LED Forward Voltage G3VM-S2, G3VM-S3



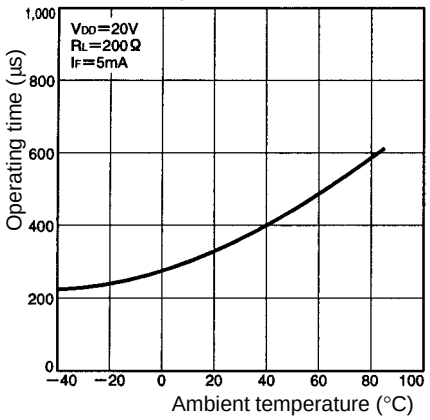
Output ON-resistance vs. Ambient Temperature G3VM-S2, G3VM-S3



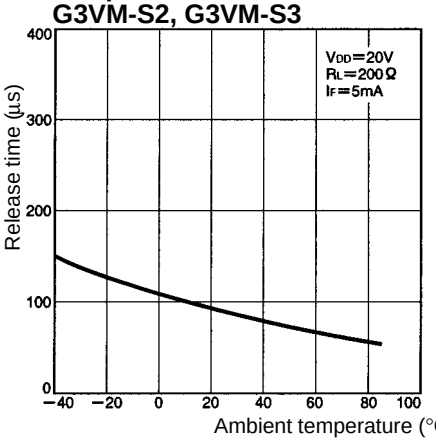
Leakage Current vs. Ambient Temperature G3VM-S2, G3VM-S3



Operating Time vs. Ambient Temperature G3VM-S2, G3VM-S3



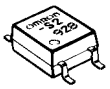
Release Time vs. Ambient Temperature G3VM-S2, G3VM-S3

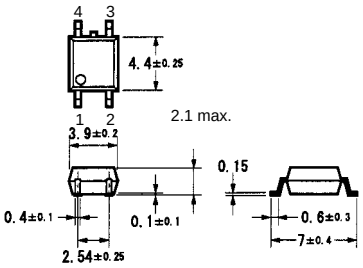


Dimensions

Note: All units are in millimeters unless otherwise indicated.

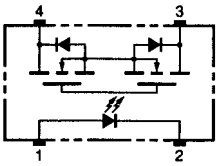
G3VM-S2



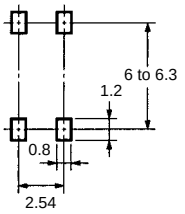


Unit: mm
Weight: 0.1 g

Terminal Arrangement/ Internal Connections (Top View)



Actual Mounting Pad Dimensions (Recommended Value, Bottom View)



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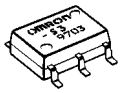
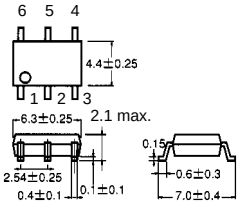
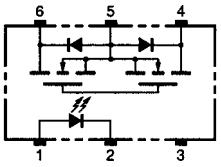
G3VM-S3





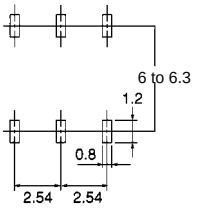
Unit: mm
Weight: 0.13 g

Terminal Arrangement/ Internal Connections (Top View)



1: Anode
2: Cathode
4: Drain D1
5: Source
6: Drain D2

Actual Mounting Pad Dimensions (Recommended Value, Bottom View)



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Precautions

■ Correct Use

Recommended Operating Conditions

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

Item	Min.	Type	Max.
Operating LED forward current	5 mA	7.5 mA	25 mA
Releasing LED forward voltage	0 V	---	0.8 V

Note: Refer to page 48 for precautions common to all G3VM models.