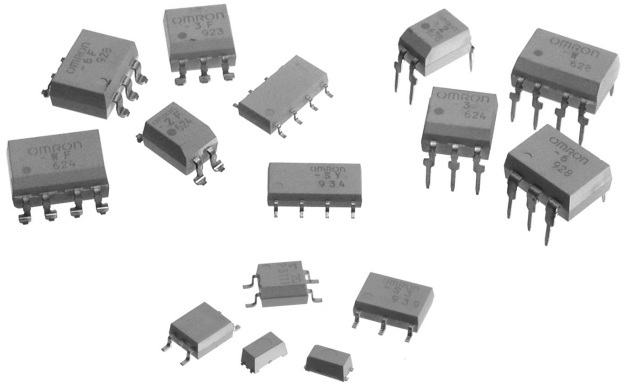
MOS FET Relays
G3VM Series

Wide Range of Contact Forms, Sizes and Package Types

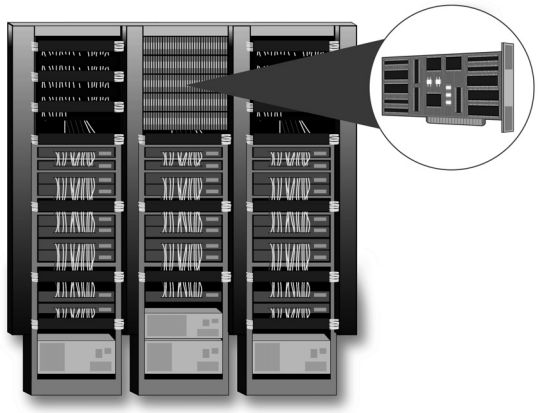
- Controls load voltages up to 600 V.
- Terminal packages include PCB through-hole, SMT gullwing, SOP, and SSOP.
- Low ON-resistance, low output capacitance, current limiting, and high dielectric (5000 VAC) models available.
- Packaged for efficient automatic insertion: PCB through-hole and SMT are in tubes; tape-and-reel packaging is standard for SOP and SSOP models, and optional for SMT models ("TR" suffix).
- Complete specifications follow, divided by Package Type, Terminals and Contact Form.



Typical Applications

■ Communications

- Local area network equipment
- Central office circuit boards for subscriber line interfaces, multiplexers and other routing equipment
- Wireless communications for cell phones and pagers
- Set-top TV boxes with internal modems
- Fax machines
- PCMCIA card
- Internal modems for PDA equipment and laptop computers



■ Test & Measurement

- Board testers
- IC testers
- Portable voltage testers

■ Security

- Alarm control boards
- Home security systems
- Garage door openers

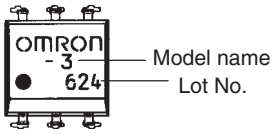
Selection Guide

Load voltage	Contact form	Package/ Terminal shape	No. of terminals	Model	Load current (mA)	Voltage withstand (VAC)	ON resistance (max.)	Output capacitance	Additional features	Page no.
20V	1 Form A	SMT	8	**G3VM-22FO**	150	2,500	4 Ω	8 pF (typ.)	Low ON resistance	62
		SOP	4	**G3VM-21GR**	160	1,500	8 Ω	2.5 pF (max.)	Low pF•Ω	70
				G3VM-21GR1	300	1,500	1.5 Ω	12 pF (max.)	Low pF•Ω	70
		SSOP	4	**G3VM-21LR**	150	1,500	8 Ω	12 pF (max.)	—	88
				G3VM-21LR1	300	1,500	1.5 Ω	12 pF (max.)	Low pF•Ω	88
40V	1 Form A	SOP	4	**G3VM-41GR3**	80	1,500	37 Ω	1.4 pF (max.)	—	72
				G3VM-41GR4	250	1,500	3 Ω	7 pF (max.)	Low pF•Ω	74
				G3VM-41GR5	300	1,500	1.5 Ω	14 pF (max.)	Low pF•Ω	74
				G3VM-41GR6	120	1,500	15 Ω	2 pF (max.)	Low pF•Ω	74
		SSOP	4	**G3VM-41LR3**	80	1,500	35 Ω	1.4 pF (max.)	—	88
				G3VM-41LR4	250	1,500	3 Ω	7 pF (max.)	Low pF•Ω	90
				G3VM-41LR5	300	1,500	1.5 Ω	14 pF (max.)	Low pF•Ω	90
				G3VM-41LR6	120	1,500	15 Ω	2 pF (max.)	Low pF•Ω	90
60V	1 Form A	Thru-hole	4	**G3VM-61A**	500	2,500	2 Ω	140 pF (max.)	Low ON resistance	32
				G3VM-61A1	500	2,500	2 Ω	130 pF (typ.)	Low ON resistance	34
			6	**G3VM-61B**	500	2,500	2 Ω	140 pF (max.)	Low ON resistance	38
				G3VM-61B1	500	2,500	2 Ω	130 pF (typ.)	Low ON resistance	40
				G3VM-V	300	2,500	2 Ω	170 pF (typ.)	Low ON resistance	40
			8	**G3VM-61CP**	500	2,500	0.6 Ω	500 pF (max.)	Low ON resistance	42
				G3VM-61CR	2000	1,500	0.12 Ω	1400 pF (max.)	Low ON resistance	44
		SMT	4	**G3VM-61D**	500	2,500	2 Ω	140 pF (max.)	Low ON resistance	52
				G3VM-61D1	500	2,500	2 Ω	130 pF (typ.)	Low ON resistance	54
			6	**G3VM-61E**	500	2,500	2 Ω	140 pF (max.)	Low ON resistance	58
				G3VM-61E1	500	2,500	2 Ω	130 pF (typ.)	Low ON resistance	60
60 V	1 Form A	SMT	6	**G3VM-VF**	300	2,500	2 Ω	170 pF (typ.)	Low ON resistance	60
			8	**G3VM-61FP**	500	2,500	0.6 Ω	500 pF (max.)	Low ON resistance	64
				G3VM-61FR	2000	1,500	0.12 Ω	1400 pF (max.)	Low ON resistance	64
		SOP	4	**G3VM-61G1**	400	1,500	2 Ω	130 pF (typ.)	Low ON resistance	76
				G3VM-S1	400	1,500	2 Ω	140 pF (max.)	Low ON resistance	76
			6	**G3VM-61H1**	400	1,500	2 Ω	130 pF (typ.)	Low ON resistance	80
	2 Form A	Thru-hole	8	**G3VM-62C1**	500	2,500	2 Ω	130 pF (typ.)	Low ON resistance	46
		SMT	8	**G3VM-62F1**	500	2,500	2 Ω	130 pF (typ.)	Low ON resistance	66
		SOP	8	**G3VM-62J1**	400	1,500	2 Ω	130 pF (typ.)	Low ON resistance	84
				G3VM-SY	300	1,500	2 Ω	140 pF (max.)	Low ON resistance	86
80 V	1 Form A	SOP	4	**G3VM-81G1**	350	1,500	1.2 Ω	40 pF (max.)	Low ON resistance	76
			6	**G3VM-81HR**	1250	1,500	0.15 Ω	1000 pF (max.)	Low ON resistance	80
200 V	1 Form A	SOP	4	**G3VM-S5**	150	1,500	8 Ω	100 pF (typ.)	—	78

Load voltage	Contact form	Package/ Terminal shape	No. of terminals	Model	Load current (mA)	Voltage withstand (VAC)	ON resistance (max.)	Output capacitance	Additional features	Page no.
350 V	1 Form A	Thru-hole	4	**G3VM-2**	120	2,500	35 Ω	75 pF (typ.)	—	30
				G3VM-2L	120	2,500	35 Ω	75 pF (typ.)	Current limiting	30
				G3VM-351A	120	2,500	35 Ω	30 pF (typ.)	—	30
			6	**G3VM-351B**	120	2,500	35 Ω	30 pF (typ)	—	34
				G3VM-3	120	2,500	35 Ω	75 pF (typ)	—	36
				G3VM-3L	120	2,500	35 Ω	75 pF (typ.)	Current limiting	36
350 V	1 Form A	SMT	4	**G3VM-2F**	120	2,500	35 Ω	75 pF (typ.)	—	50
				G3VM-2FL	120	2,500	35 Ω	75 pF (typ.)	Current limiting	50
				G3VM-351D	120	2,500	35 Ω	30 pF (typ.)	—	50
			6	**G3VM-351E**	120	2,500	35 Ω	30 pF (typ.)	—	54
				G3VM-3F	120	2,500	35 Ω	75 pF (typ.)	—	56
				G3VM-3FL	120	2,500	35 Ω	75 pF (typ.)	Current limiting	56
		SOP	4	**G3VM-351G**	110	1,500	35 Ω	30 pF (typ.)	—	70
				G3VM-S2	120	1,500	35 Ω	75 pF (typ.)	—	78
			6	**G3VM-351H**	110	1,500	35 Ω	30 pF (typ.)	—	78
				G3VM-S3	120	1,500	35 Ω	75 pF (typ.)	—	82
	1 Form A + 1 Form B	Thru-hole	8	**G3VM-355CR**	120	2,500	25 Ω	65 pF (typ.)	—	44
		SMT	8	**G3VM-355FR**	120	2,500	25 Ω	65 pF (typ.)	—	64
		SOP	8	**G3VM-355JR**	120	2,500	25 Ω	65 pF (typ.)	—	82
	2 Form A	Thru-hole	8	**G3VM-352C**	120	2,500	35 Ω	30 pF (typ.)	—	44
				G3VM-W	120	2,500	35 Ω	75 pF (typ.)	—	46
				G3VM-WL	120	2,500	35 Ω	75 pF (typ.)	Current limiting	48
		SMT	8	**G3VM-352F**	120	2,500	35 Ω	30 pF (typ.)	—	66
				G3VM-WF	120	2,500	35 Ω	75 pF (typ.)	—	68
				G3VM-WFL	120	2,500	35 Ω	75 pF (typ.)	Current limiting	68
		SOP	8	**G3VM-352J**	110	1,500	35 Ω	30 pF (typ.)	—	82
				G3VM-SW	120	1,500	35 Ω	75 pF (typ.)	—	84
	1 Form B	Thru-hole	4	**G3VM-353A**	150	2,500	25 Ω	100 pF (typ.)	—	32
			6	**G3VM-353B**	150	2,500	25 Ω	100 pF (typ.)	—	34
		SMT	4	**G3VM-353D**	150	2,500	25 Ω	100 pF (typ.)	—	52
			6	**G3VM-353E**	150	2,500	25 Ω	100 pF (typ.)	—	54
350 V	1 Form B	SOP	4	**G3VM-353G**	120	1,500	25 Ω	130 pF (typ.)	—	72
			6	**G3VM-353H**	120	1,500	25 Ω	65 pF (typ.)	—	80
	2 Form B	Thru-hole	8	**G3VM-354C**	120	2,500	35 Ω	100 pF (typ.)	—	48
		SMT	8	**G3VM-354F**	120	2,500	35 Ω	100 pF (typ.)	—	68
		SOP	8	**G3VM-354J**	120	1,500	25 Ω	65 pF (typ.)	—	86
400 V	1 Form A	Thru-hole	4	**G3VM-401A**	120	2,500	35 Ω	70 pF (typ.)	—	32
			6	**G3VM-401B**	120	2,500	35 Ω	75 pF (typ.)	—	36
				G3VM-401BY	120	5,000	35 Ω	75 pF (typ.)	High I/O isolation	38
		SMT	4	**G3VM-401D**	120	2,500	35 Ω	70 pF (typ.)	—	52
			6	**G3VM-401E**	120	2,500	35 Ω	75 pF (typ.)	—	56
				G3VM-401EY	120	5,000	35 Ω	75 pF (typ.)	High I/O isolation	58
		SOP	4	**G3VM-401G**	120	1,500	35 Ω	70 pF (typ.)	—	72
	2 Form A	Thru-hole	8	**G3VM-402C**	120	2,500	35 Ω	70 pF (typ.)	—	46
		SMT	8	**G3VM-402F**	120	2,500	35 Ω	70 pF (typ.)	—	66
		SOP	8	**G3VM-402J**	120	2,500	35 Ω	70 pF (typ.)	—	84
600 V	1 Form A	Thru-hole	6	**G3VM-601BY**	100	5,000	45 Ω	100 pF (typ.)	High I/O isolation	38
		SMT	6	**G3VM-601EY**	100	5,000	35 Ω	100 pF (typ.)	High I/O isolation	58

Part Number Index and Ordering Information

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



The following tables show standard quantities of G3VM relays as shipped in tubes or tape-and-reel packaging. Dimensions for tape-and-reel parts are shown in individual data sheets that follow.

Description	Packaging	Standard pack quantity	Model	Page no.
MOSFET THRU-HOLE RELAY	Tube	50	**G3VM-2**	30
MOSFET SMT RELAY	Tube	50	**G3VM-2F**	50
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-2F(TR)**	50
MOSFET SMT RELAY	Tube	50	**G3VM-2FL**	50
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-2FL(TR)**	50
MOSFET THRU-HOLE RELAY	Tube	50	**G3VM-2L**	30
MOSFET SOP RELAY	Tube	50	**G3VM-21GR**	70
MOSFET SOP RELAY	Tape-and-reel	2500	**G3VM-21GR(TR)**	70
MOSFET SOP RELAY	Tube	50	**G3VM-21GR1**	70
MOSFET SOP RELAY	Tape-and-reel	2500	**G3VM-21GR1(TR)**	70
MOSFET SSOP RELAY	Tape-and-reel	1500	**G3VM-21LR**	88
MOSFET SSOP RELAY	Tape-and-reel	1500	**G3VM-21LR1**	88
MOSFET SMT RELAY	Tube	50	**G3VM-22FO**	62
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-22FO(TR)**	62
MOSFET THRU-HOLE RELAY	Tube	50	**G3VM-3**	36
MOSFET SMT RELAY	Tube	50	**G3VM-3F**	56
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-3F(TR)**	56
MOSFET SMT RELAY	Tube	50	**G3VM-3FL**	56
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-3FL(TR)**	56
MSOFET THRU-HOLE RELAY	Tube	50	**G3VM-3L**	36
MOSFET THRU-HOLE RELAY	Tube	50	**G3VM-351A**	30
MOSFET THRU-HOLE RELAY	Tube	50	**G3VM-351B**	34
MOSFET SMT RELAY	Tube	50	**G3VM-351D**	50
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-351D(TR)**	50
MOSFET SMT RELAY	Tube	50	**G3VM-351E**	54
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-351E(TR)**	54
MOSFET SOP RELAY	Tube	50	**G3VM-351G**	70
MOSFET SOP RELAY	Tape-and-reel	2500	**G3VM-351G(TR)**	70
MOSFET SOP RELAY	Tube	50	**G3VM-351H**	78
MOSFETSOP RELAY	Tape-and-reel	2500	**G3VM-351H(TR)**	78
MOSFET THRU-HOLE RELAY	Tube	50	**G3VM-352C**	44
MOSFET SMT RELAY	Tube	50	**G3VM-352F**	66
MOSFET SMT RELAY	Tape-and-reel	1500	**G3VM-352F(TR)**	66
MOSFET SOP RELAY	Tube	50	**G3VM-352J**	82
MOSFET SOP RELAY	Tape-and-reel	2500	**G3VM-352J(TR)**	82

G3VM-3, -3L, -401B

Maximum Rating

Parameter		Comments and conditions		G3VM-3	G3VM-3L	G3VM-401B
Contact form/no. of terminals		—		1 Form A/6 pins	1 Form A/6 pins	1 Form A/6 pins
Input (LED)	LED forward current	I_F	Typical	50 mA	50 mA	50 mA
		I_{FP} (100 μs pulse, 100 pps)	Max.	1 A	1 A	1 A
	Forward current derating	Ta ≥ 25°C		-0.5 mA/°C	-0.5 mA/°C	-0.5 mA/°C
	Reverse voltage	V_R	Max.	5 V	5 V	5 V
	Junction temperature (T_J)			125°C	125°C	125°C
Output (Detector)	Output voltage strength	V_{OFF}		60 V	350 V	400 V
	Continuous load current	I_O		120 mA (for A) 120 mA (for B) 160 mA (for C)	120 mA	120 mA (for A) 120 mA (for B) 240 mA (for C)
	ON-state current derating	Ta ≥ 25°C		-1.2 mA/°C (for A)	-1.2 mA/°C	-1.2 mA/°C (for A)
	Junction temperature (T_J)			125°C	125°C	125°C
Dielectric strength		$V_{I/O}$ for 1 minute min.		2500 VAC	2500 VAC	2500 VAC
Temperature	Ambient	Ta with no icing		-20° to +85°C	-40° to +85°C	-40° to +85°C
	Storage	Tstg with no icing		-55° to +100°C	-55° to +125°C	-55° to +125°C

Electrical Characteristics

Parameter		Comments and conditions		G3VM-3	G3VM-3L	G3VM-401B
Input	LED forward voltage (V_F)	I_F=10 mA	Min.	1.0 V	1.0 V	1.0 V
			Typical	1.15 V	1.15 V	1.15 V
			Max.	1.3 V	1.3 V	1.3 V
	Reverse current	I_R	Max.	10 μA	10 μA	10 μA
	Reverse voltage	V_R	Max.	5 V	5 V	5 V
	Capacitance (C_T)	V = 0; freq. = 1 MHz	Typical	30 pF	30 pF	30 pF
	Keep ON LED current (I_{FT})	At I_O	Typical	—	—	1 mA
			Max.	3 mA	3 mA	3 mA
Output	ON-resistance (R_{ON})	I_F=5 mA	Typical	22 Ω (I_{ON}=120 mA) for connection A	22 Ω (I_{ON}=120 mA)	17 Ω (I_{ON}=120 mA) for connection A
			Max.	35 Ω (I_{ON}=120 mA) for connection A	35 Ω (I_{ON}=120 mA)	35 Ω (I_{ON}=120 mA) for connection A
			Typical	16 Ω (I_{ON}=120 mA) for connection B	—	11 Ω (I_{ON}=120 mA) for connection B
			Max.	23 Ω (I_{ON}=120 mA) for connection B	—	20 Ω (I_{ON}=120 mA) for connection B
			Typical	8 Ω (I_{ON}=160 mA) for connection C	—	6 Ω (I_{ON}=240 mA) for connection C
			Max.	12 Ω (I_{ON}=160 mA) for connection C	—	10 Ω (I_{ON}=240 mA) for connection C
	OFF-state leakage current (I_{LEAK})	At V_{OFF}	Max.	1.0 μA	1.0 μA	1.0 μA
	Limit current (I_{LIM})	I_F = 5 mA, V_{DD} = 5 V, t = 5 ms	Min.	—	150 mA	—
			Max.	—	300 mA	—
Transfer characteristics	I/O capacitance	($C_{I/O}$)	Typical	0.8 pF	0.8 pF	0.8 pF
	I/O resistance	(R_{IO})	Min.	1000 MΩ	1000 MΩ	1000 MΩ
	Operate time	(t_{ON})	Max.	1.0 ms	1.0 ms	1.0 ms
	Release time	(t_{OFF})	Max.	1.0 ms	1.0 ms	1.0 ms

Optimum Operating Conditions

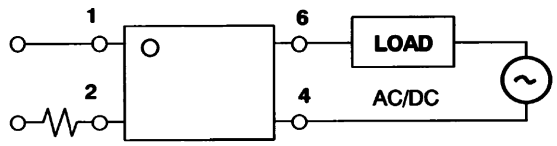
Parameter	Comments and conditions		G3VM-3	G3VM-3L	G3VM-401B
Output voltage strength	V_{DD}	Max.	280 V	280 V	320 V
Operate LED forward current	I_F	Min.	5 mA	5 mA	5 mA
		Typical	7.5 mA	10 mA	7.5 mA
		Max.	25 mA	25 mA	25 mA
Continuous load current	I_O	Max.	120 mA	120 mA	120 mA
Ambient temperature	T_A		-20° to 65°C	-20° to 65°C	-20° to 65°C

Dimensions

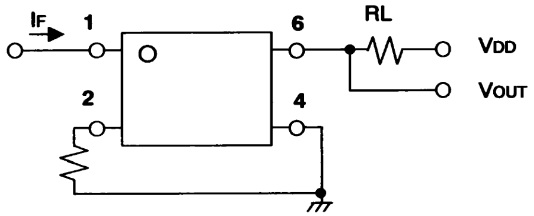
Item	G3VM-3	G3VM-3L	G3VM-401B
Dimensions	See page 92	See page 92	See page 92

Connections

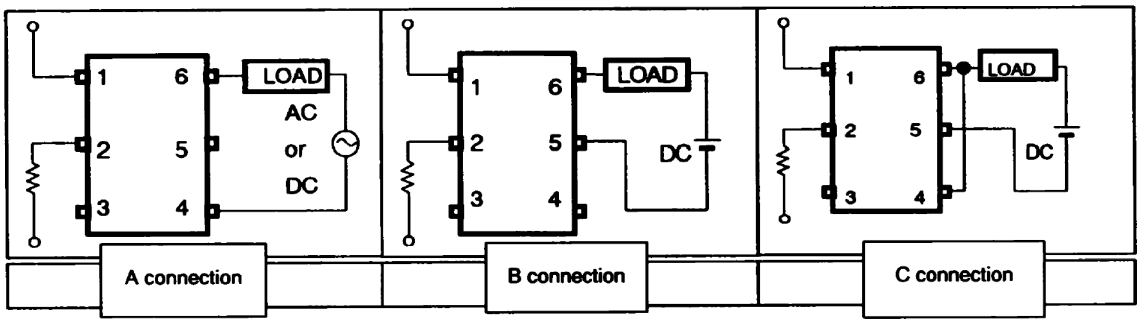
G3VM-3L



G3VM-3, -3L, -401B



G3VM-3, -401B



Timing Chart