G3VM-21LR□

MOS FET Relays SSOP, Low-output-capacitance and Low-ON-resistance Type (with Low C × R)

MOS FET Relays in SSOP packages that achieve a low C × R

- **Load voltage: 20 V**
- **G3VM-21LR: Low C × R = 5 pF·Ω, C_{OFF} (standard) = 1 pF, R_{ON} (standard) = 5 Ω**
- **G3VM-21LR10: Low C × R = 2.4 pF·Ω, C_{OFF} (standard) = 0.8 pF, R_{ON} (standard) = 3 Ω**
- **G3VM-21LR1: Low C × R = 4 pF·Ω, C_{OFF} (standard) = 5 pF, R_{ON} (standard) = 0.8 Ω**
- **G3VM-21LR11: Low C × R = 7.2 pF·Ω, C_{OFF} (standard) = 40 pF, R_{ON} (standard) = 0.18 Ω**

RoHS Compliant

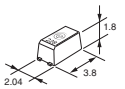
Note: The actual product is marked differently from the image shown here.

■Application Examples

- **Semiconductor test equipment**
- **Communication equipment**
- **Test & Measurement equipment**
- **Data loggers**

■Package (Unit : mm, Average)

SSOP 4-pin



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

■Model Number Legend

G3VM-□□□□□
1 2 3 4 5

1. Load Voltage
2 : 20 V

2. Contact form
1 : 1a (SPST-NO)

3. Package
L : SSOP 4-pin

4. Additional functions
R: Low ON resistance

5. Other informations
When specifications overlap, serial code is added in the recorded order.

■Ordering Information

Package	Contact form	Terminals	Load voltage (peak value) ✻	Continuous load current (peak value) ✻	Tape cut packaging		Tape packaging	
					Model	Minimum package quantity	Model	Minimum package quantity
SSOP4	1a (SPST-NO)	Surface-mounting Terminals	20 V	160 mA	G3VM-21LR	1 pc.	G3VM-21LR(TR05)	500 pcs.
				200 mA	G3VM-21LR10		G3VM-21LR10(TR05)	
				450 mA	G3VM-21LR1		G3VM-21LR1(TR05)	
				900 mA	G3VM-21LR11		G3VM-21LR11(TR05)	

✻ The AC peak and DC value are given for the load voltage and continuous load current.
Note: To order tape packaging for Relays with surface-mounting terminals, add "(TR05)" to the end of the model number.
Tape-cut SSOPs are packaged without humidity resistance. Use manual soldering to mount them. Refer to common precautions.

■Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Unit	Measurement conditions
Input	LED forward current	I_F	50	30	50	50	mA	
	LED forward current reduction rate	ΔI_F/°C	-0.5	-0.3	-0.5		mA/°C	Ta ≥ 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 (AC peak/DC)	I_O	160	200	450	900	mA	
	ON current reduction rate	ΔI_O/°C	-1.6	-2.0	-4.5	-12	mA/°C	G3VM-21LR11 : Ta ≥ 50°C Others : Ta ≥25°C
	Pulse ON current	Iop	480	600	1,350	2,700	mA	t=100 ms, Duty=1/10
	Connection temperature	T_J	125				°C	
Dielectric strength between I/O (See note 1.)		V_{I-O}	1500				Vrms	AC for 1 min
Ambient operating temperature		Ta	-20 to +85				°C	With no icing or condensation
Ambient storage temperature		Tstg	-40 to +125				°C	
Soldering temperature		–	260				°C	10 s

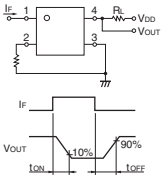
Note: 1. The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

G3VM-21LR□

■Electrical Characteristics (Ta = 25°C)

Item		Symbol		G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Unit	Measurement conditions
Input	LED forward voltage	V_F	Minimum	1.0	1.15	1.0		V	G3VM-21LR10 : I_F=5 mA G3VM-21LR/21LR1/21LR11 : I_F=10 mA
			Typical	1.15	1.35	1.15			
			Maximum	1.3	1.45	1.3			
	Reverse current	I_R	Maximum	10				μA	V_R=5 V
	Capacitance between terminals	C_T	Typical	15	70	15		pF	V=0, f=1 MHz
	Trigger LED forward current	I_{FT}	Maximum	4	3	4	3	mA	I_O=100 mA
	Release LED forward current	I_{FC}	Minimum	0.2	0.1	0.2	0.1	mA	I_{OFF}=10 μA
Output	Maximum resistance with output ON	R_{ON}	Typical	5	3	0.8	0.18	Ω	G3VM-21LR/21LR1 : I_F=5 mA, I_O=Continuous load current ratings, t=10 ms G3VM-21LR10/21LR11 : I_F=5 mA, I_O=Continuous load current ratings, t<1 s
			Maximum	8	5	1.2	0.22		
	Current leakage when the relay is open	I_{LEAK}	Typical	–	0.01	–		nA	G3VM-21LR/21LR1: V_{OFF}=20 V, Ta=50°C G3VM-21LR10/21LR11 : V_{OFF}=20 V
			Maximum	1	0.2	1			
	Capacitance between terminals	C_{OFF}	Typical	1	0.8	5	40	pF	G3VM-21LR10 : V=0, f=100 MHz G3VM-21LR/21LR1/21LR11 : V=0, f=100 MHz, t<1 s
			Maximum	2.5	1.1	12	–		
Capacitance between I/O terminals		C_{I-O}	Typical	0.8	0.3	0.8	0.3	pF	f=1 MHz, V_S=0 V
Insulation resistance between I/O terminals		R_{I-O}	Minimum	1000				MΩ	V_{I-O}=500 VDC, RoH≤60%
			Typical	10^8					
Turn-ON time		t_{ON}	Typical	0.06	–	0.2	0.3	ms	I_F=5 mA, R_L=200 Ω, V_{DD}=10 V (See note 2.)
			Maximum	0.5	0.2	0.5	2		
Turn-OFF time		t_{OFF}	Typical	0.12	–	0.2			
			Maximum	0.5	0.2	0.5	1		

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



■Recommended Operating Conditions

For usage with high reliability, Recommended Operation Conditions is a measure that takes into account the derating of Absolute Maximum Ratings and Electrical Characteristics.

Each item on this list is an independent condition, so it is not simultaneously satisfy several conditions.

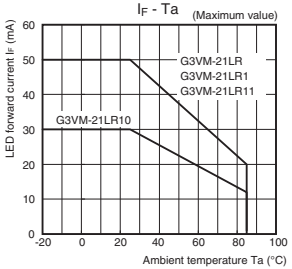
Item	Symbol		G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Unit
Load voltage (AC peak/DC)	V_{DD}	Maximum	20				V
Operating LED forward current	I_F	Minimum	10	–	10	–	mA
		Maximum	30	20	30	20	
Continuous load current (AC peak/DC)	I_O	Maximum	160	200	450	900	
Ambient operating temperature	Ta	Minimum	-20				°C
		Maximum	60			65	

■Spacing and Insulation

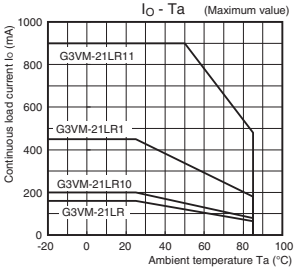
Item	Minimum	Unit
Creepage distances	2.5	mm
Clearance distances	2.5	
Internal isolation thickness	0.1	

■Engineering Data

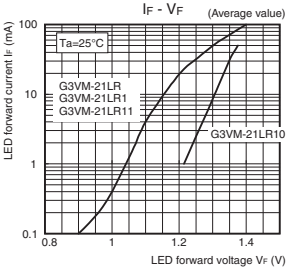
● **LED forward current vs. Ambient temperature**



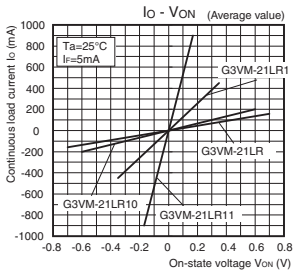
● **Continuous load current vs. Ambient temperature**



● **LED forward current vs. LED forward voltage**

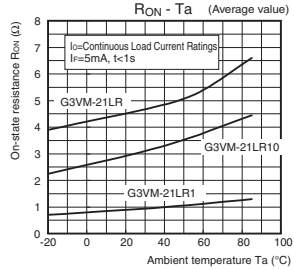


● **Continuous load current vs. On-state voltage**

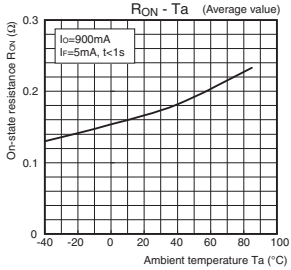


● **On-state resistance vs. Ambient temperature**

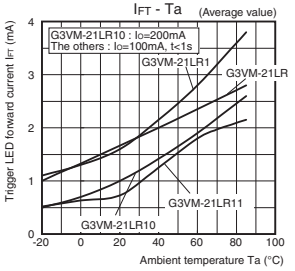
G3VM-21LR/21LR10/21LR1



G3VM-21LR11

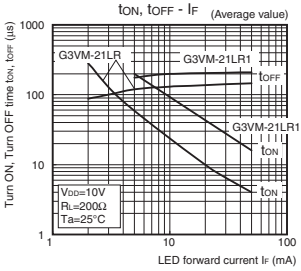


● **Trigger LED forward current vs. Ambient temperature**

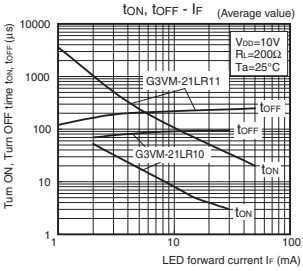


● **Turn ON, Turn OFF time vs. LED forward current**

G3VM-21LR/21LR1



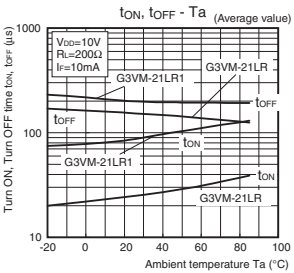
G3VM-21LR10/21LR11



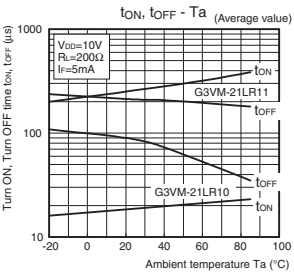
G3VM-21LR□

■Engineering Data

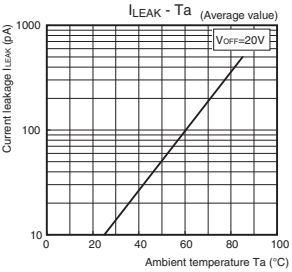
● **Turn ON, Turn OFF time vs. Ambient temperature**
G3VM-21LR/21LR1



G3VM-21LR10/21LR11

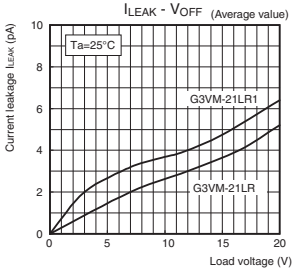


● **Current leakage vs. Ambient temperature**
G3VM-21LR10

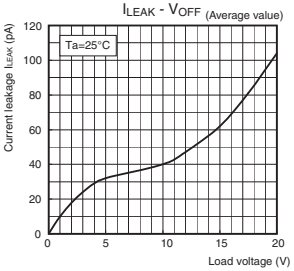


● **Current leakage vs. Load voltage**

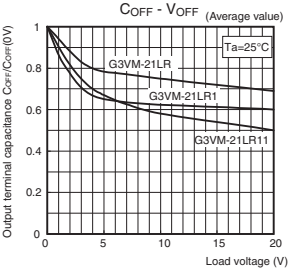
G3VM-21LR/21LR1



G3VM-21LR11



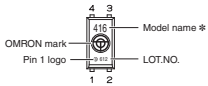
● **Output terminal capacitance vs. Load voltage**
G3VM-21LR/21LR1/21LR11



■Appearance / Terminal Arrangement / Internal Connections

●Appearance

SSOP (Shrink Small Outline Package)
SSOP 4-pin

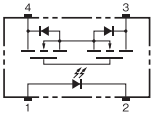


Note: 1. The actual product is marked differently from the image shown here.
Note: 2. "G3VM" does not appear in the model number on the Relay.

✻ Actual model name marking for each model

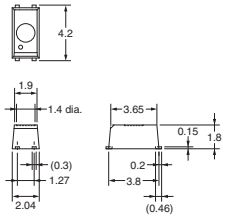
Model	Marking
G3VM-21LR	210
G3VM-21LR10	21A
G3VM-21LR1	211
G3VM-21LR11	21B

●Terminal Arrangement/ Internal Connections (Top View)



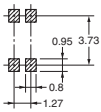
■Dimensions (Unit: mm)

Surface-mounting Terminals
Weight: 0.03 g



Unless otherwise specified, the dimensional tolerance is ± 0.1 mm.

Actual Mounting Pad Dimensions
(Recommended Value, TOP VIEW)



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

■Approved Standards

UL recognized

Approved Standards	Contact form	File No.
UL (recognized)	1a (SPST-NO)	E80555

■Safety Precautions

• Refer to the *Common Precautions for All MOS FET Relays* for precautions that apply to all MOS FET Relays.