

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

Application Examples

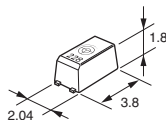
- Semiconductor test equipment
- Communication equipment
- Test & Measurement equipment
- Data loggers



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

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. Contact form 3. Package
2 : 20 V 1 : 1a (SPST-NO) L : SSOP 4-pin

4. Additional functions 5. Other informations
R: Low ON resistance 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
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	
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	I _{OP}	480	600	1,350	2,700	mA	t=100 ms, Duty=1/10
Connection temperature	T _J	125				°C	
Dielectric strength between I/O *	V _{I-O}	1500				V _{rms}	AC for 1 min
Ambient operating temperature	T _a	-20 to +85				°C	With no icing or condensation
Ambient storage temperature	T _{stg}	-40 to +125				°C	
Soldering temperature	-	260				°C	10 s

* 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.

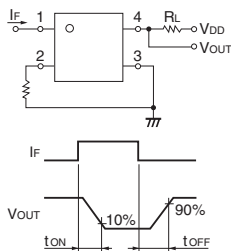
SSOP

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
Output	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
	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, R _{oH} ≤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 *	
		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			

* 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.

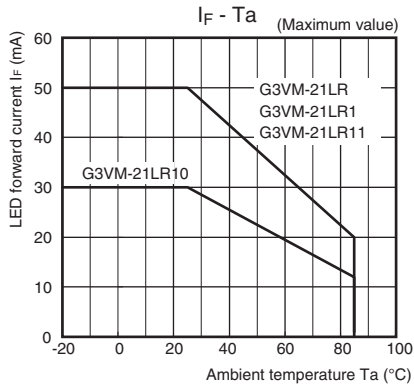
Item	Symbol		G3VM-21LR	G3VM-21LR10	G3VM-21LR1	G3VM-21LR11	Unit
Load voltage (AC peak/DC)	V _{DD}	Maximum	20				V
		Minimum	10	–	10	–	
Operating LED forward current	I _F	Maximum	30	20	30	20	mA
		Maximum	160	200	450	900	
Continuous load current (AC peak/DC)	I _o	Maximum	–				–
		Maximum	–				
Ambient operating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

■Spacing and Insulation

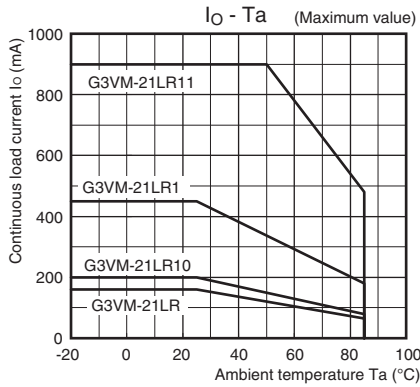
Item	Minimum	Unit
Creepage distances	2.5	mm
Clearance distances	2.5	
Internal isolation thickness	0.1	

Engineering Data

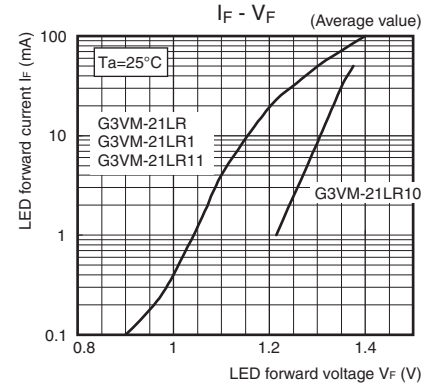
LED forward current vs. Ambient temperature



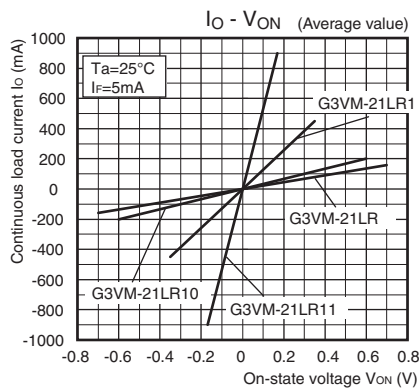
Continuous load current vs. Ambient temperature



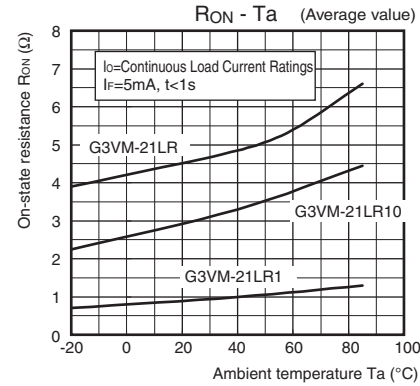
LED forward current vs. LED forward voltage



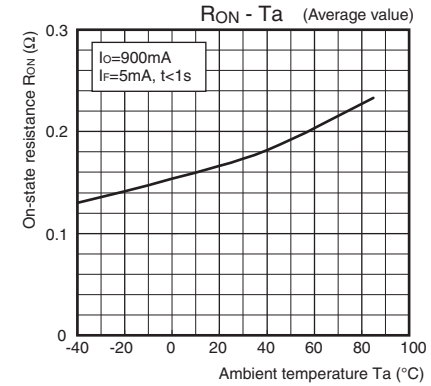
Continuous load current vs. On-state voltage



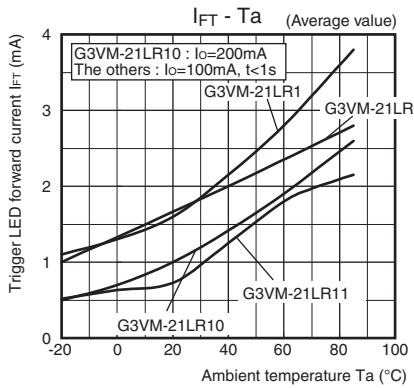
On-state resistance vs. Ambient temperature



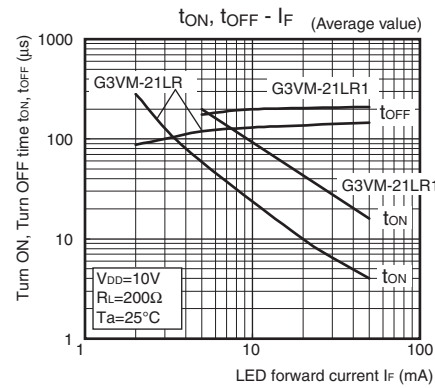
G3VM-21LR11



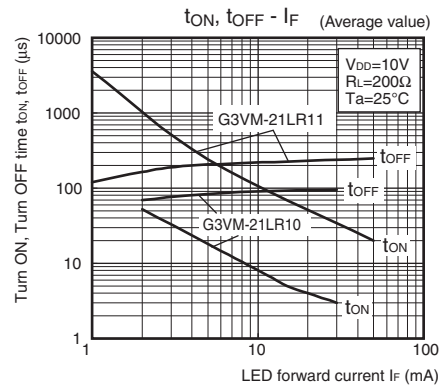
Trigger LED forward current vs. Ambient temperature



Turn ON, Turn OFF time vs. LED forward current

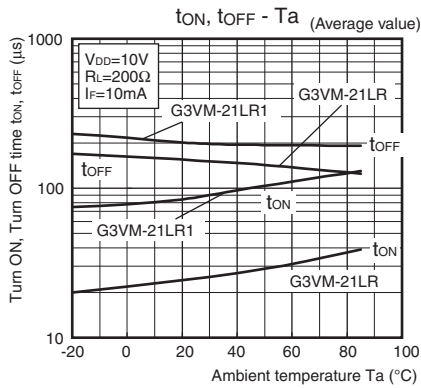


G3VM-21LR10/21LR11

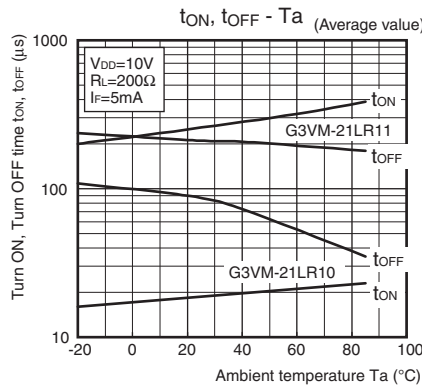


Engineering Data

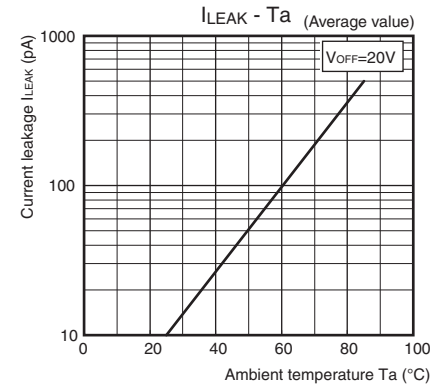
● Turn ON, Turn OFF time vs. Ambient temperature G3VM-21LR/21LR1



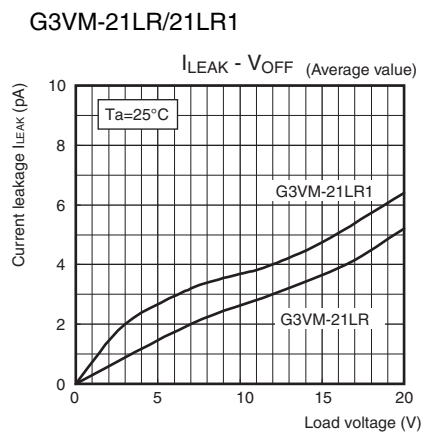
G3VM-21LR10/21LR11



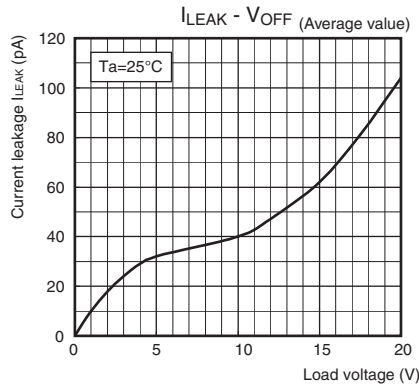
● Current leakage vs. Ambient temperature G3VM-21LR10



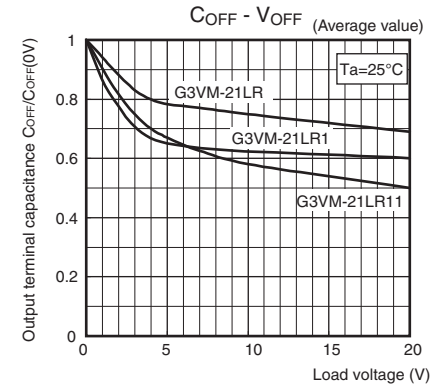
● Current leakage vs. Load voltage G3VM-21LR/21LR1



G3VM-21LR11



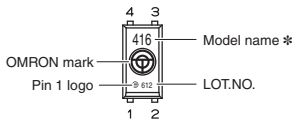
● Output terminal capacitance vs. Load voltage G3VM-21LR/21LR1/21LR11



■ Appearance / Terminal Arrangement / Internal Connections

● Appearance

SSOP (Shrink Small Outline Package)
SSOP 4-pin



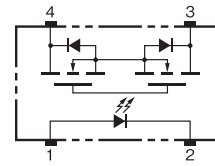
Note: 1. The actual product is marked differently from the image shown here.

Note: 2. "G3VM" does not appear in the model number on the Relay.

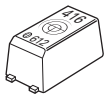
* Actual model name marking for each model

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

● Terminal Arrangement/ Internal Connections (Top View)

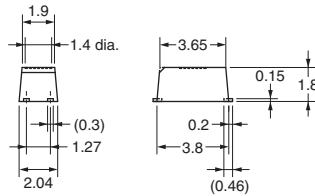


■ Dimensions (Unit: mm)



Surface-mounting Terminals

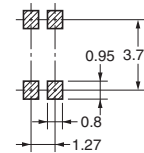
Weight: 0.03 g



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.

Please check each region's Terms & Conditions by region website.

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