

MOS FET Relays G3VM-21PR10

**Smallest Class in market, USOP Package
MOS FET Relay with Low Output Capacitance and
ON Resistance ($C \times R = 2.5 \text{ pF} \cdot \Omega$) in a 20-V Load
Voltage Model.**

- Dielectric strength of 500 Vrms between I/O
- $C_{OFF} = 0.8 \text{ pF}$ (typical) and $R_{ON} = 3 \Omega$ (typical).
- RoHS compliant.

Application Examples

- Semiconductor inspection tools
- Measurement devices and Data loggers
- Communication equipment



NEW

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

List of Models

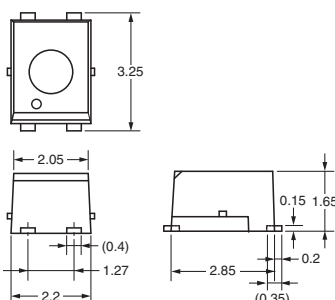
Package Type	Contact form	Terminals	Load voltage (peak value)	Model	Number per tape
USOP4	SPST-NO	Surface-mounting terminals	20 VAC or VDC	G3VM-21PR10	---
				G3VM-21PR10(TR05)	500
				G3VM-21PR10(TR)	1,500

Note: Tape-cut USOP's are packaged without humidity resistance. Use manual soldering to mount them. Refer to the common precautions contained in the Technical Users Guide, "MOS FET Relays, Technical Information".

Dimensions

Note: All units are in millimeters unless otherwise indicated.

G3VM-21PR10

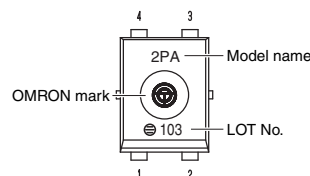
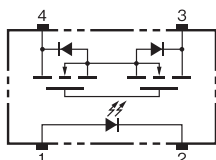


Note: The actual product is marked differently from the image shown here.

Weight: 0.03 g

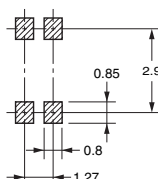
Terminal Arrangement/Internal Connections (Top View)

G3VM-21PR10



Actual Mounting Pad Dimensions (Recommended Value, Top View)

G3VM-21PR10



■ Absolute Maximum Ratings (Ta = 25°C)

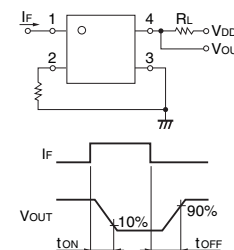
Item		Symbol	Rating	Unit	Measurement Conditions
Input	LED forward current	I_F	50	mA	
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.5	mA/°C	$T_a \geq 25^\circ\text{C}$
	LED reverse voltage	V_R	5	V	
	Connection temperature	T_J	125	°C	
Output	Load voltage (AC peak/DC)	V_{OFF}	20	V	
	Continuous load current (AC peak/DC)	I_O	200	mA	
	ON current reduction rate	$\Delta I_{ON}/^\circ\text{C}$	-2.0	mA/°C	$T_a \geq 25^\circ\text{C}$
	Pulse ON current	I_{OP}	600	mA	$t=100\text{ms, Duty}=1/10$
	Connection temperature	T_J	125	°C	
Dielectric strength between input and output (See note 1.)		V_{I-O}	500	V_{rms}	AC for 1 min
Ambient operating temperature		T_a	-40 to +85	°C	With no icing or condensation
Ambient Storage temperature		T_{stg}	-40 to +125	°C	With no icing or condensation
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.

■ 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	μA	$V_R = 5 \text{ V}$
	Capacity between terminals	C_T	---	15	---	pF	$V = 0, f = 1 \text{ MHz}$
	Trigger LED forward current	I_{FT}	---	1.0	3	mA	$I_O = 100 \text{ mA}$
Output	Maximum resistance with output ON	R_{ON}	---	3.0	5	Ω	$I_F = 5 \text{ mA}, I_O = 200 \text{ mA}$ $t < 1 \text{ s}$
	Current leakage when the relay is open	I_{LEAK}	---	---	1	nA	$V_{OFF} = 20 \text{ V}, T_a = 25^\circ\text{C}$
	Capacity between terminals	C_{OFF}	---	0.8	1.1	pF	$V = 0, f = 100 \text{ MHz},$ $t < 1 \text{ s}$
Capacity between I/O terminals		C_{I-O}	---	0.4	---	pF	$f = 1 \text{ MHz}, V_s = 0 \text{ V}$
Insulation resistance between I/O terminals		R_{I-O}	1,000	---	---	M Ω	$V_{I-O} = 500 \text{ VDC},$ $R_{oh} \leq 60\%$
Turn-ON time		t_{ON}	---	0.04	0.2	ms	$I_F = 5 \text{ mA}, R_L = 200 \Omega,$ $V_{DD} = 10 \text{ V}$ (See note 2.)
Turn-OFF time		t_{OFF}	---	0.13	0.2	ms	

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



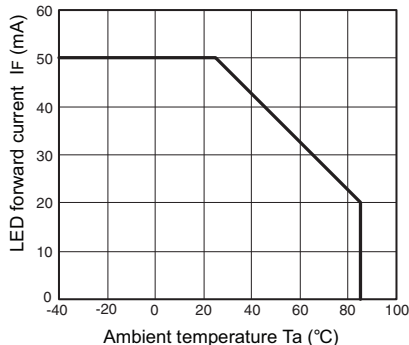
■ Recommended Operating Conditions

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

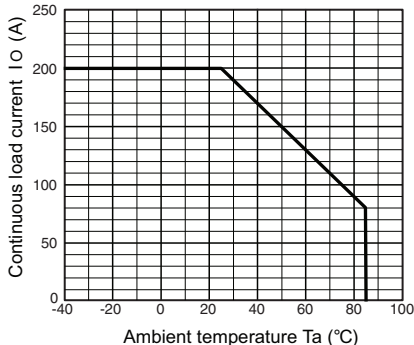
Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	V_{DD}	---	---	16	V
Operating LED forward current	I_F	5	7.5	20	mA
Continuous load current (AC peak/DC)	I_O	---	---	200	mA
Ambient Operating temperature	T_a	-20	---	65	°C

■ Engineering Data

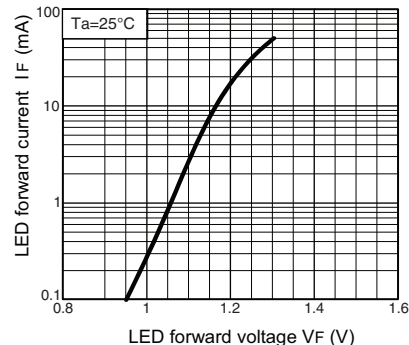
LED forward current vs. Ambient temperature
IF - Ta



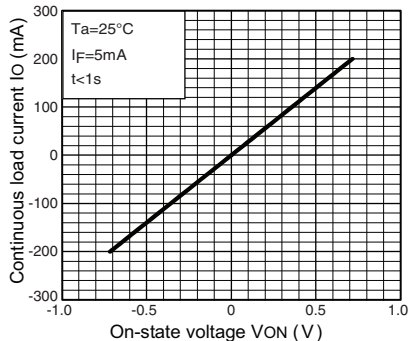
Continuous load current vs. Ambient temperature
IO - Ta



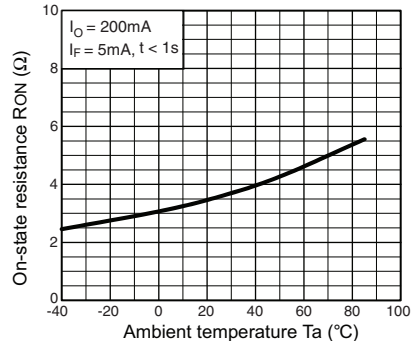
LED forward current vs. LED forward voltage
IF - VF



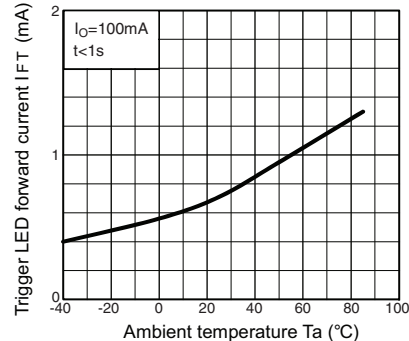
Continuous load current vs. On-state voltage
IO - VON



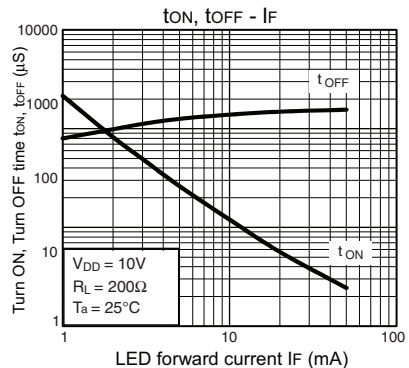
On-state resistance vs. Ambient temperature
RON - Ta



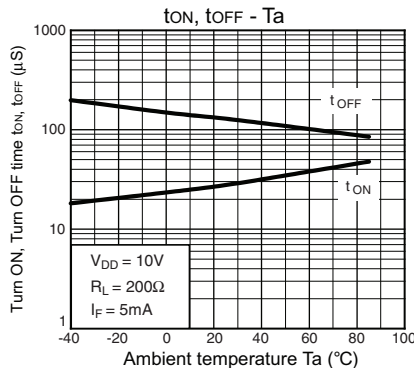
Trigger LED forward current vs. Ambient temperature
IFT - Ta



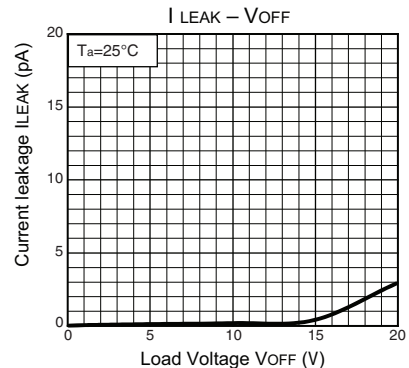
Turn ON, Turn OFF time vs. LED forward current
tON, tOFF - IF



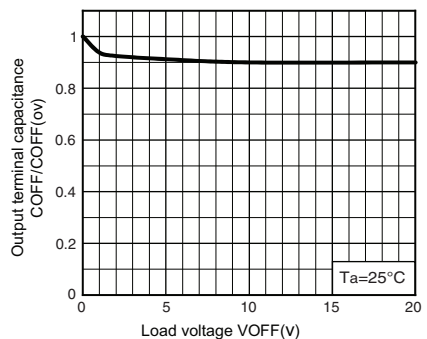
Turn ON, Turn OFF time vs. Ambient temperature
tON, tOFF - Ta



Current leakage vs. Load voltage
ILEAK - VOFF



Output terminal capacitance COFF/COFF(ov) vs. Load voltage
COFF - VOFF



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