MOS FET Relays
G3VM-51PR

Smallest Class in market, USOP Package
MOS FET Relay is designed to exibit a fast rise time and reduce signal degradation.

- ERT (Equivalent Rise Time): 40 ps (typical), 90 ps (maximum).
- Dielectric strength of 500 Vrms between I/O.
- C_{OFF} = 12 pF (typical) and R_{ON} = 1 Ω (typical).
- RoHS compliant.

NEW

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

■ Application Examples

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

■ List of Models

Package Type	Contact form	Terminals	Load voltage (peak value)	Model	Number per tape
USOP4	SPST-NO	Surface-mounting terminals	50 VAC or VDC	**G3VM-51PR**	---
				G3VM-51PR(TR05)	500
				G3VM-51PR(TR)	1,500

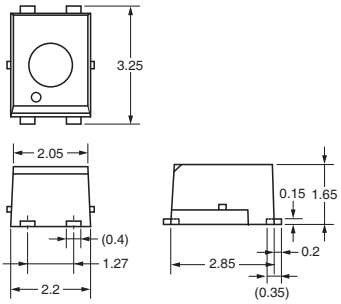
Note: Tape-cut USOP's are packaged without humidity resistance. Use manual soldering to mount them. Refer to the common precautions contained in the Technical Users Guide, "MOS FET Relays, Technical Information".

■ Dimensions

Note: All units are in millimeters unless otherwise indicated.

G3VM-51PR

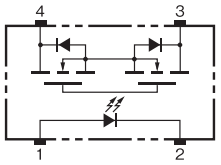
Note: The actual product is marked differently from the image shown here.

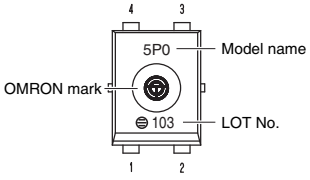


Weight: 0.03 g

■ Terminal Arrangement/Internal Connections (Top View)

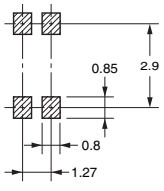
G3VM-51PR





■ Actual Mounting Pad Dimensions (Recommended Value, Top View)

G3VM-51PR



■ Absolute Maximum Ratings (Ta = 25°C)

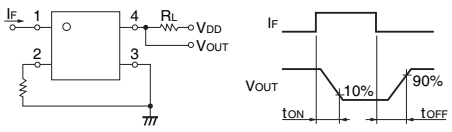
Item		Symbol	Rating	Unit	Measurement Conditions
Input	LED forward current	I_F	50	mA	
	LED forward current reduction rate	ΔI_F/°C	–0.5	mA/°C	$T_a \geq 25$°C
	LED reverse voltage	V_R	5	V	
	Connection temperature	T_J	125	°C	
Output	Load voltage (AC peak/DC)	V_{OFF}	50	V	
	Continuous load current (AC peak/DC)	I_O	300	mA	
	ON current reduction rate	ΔI_{ON}/°C	–3.0	mA/°C	$T_a \geq 25$°C
	Pulse ON current	I_{OP}	900	mA	t=100ms, 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.

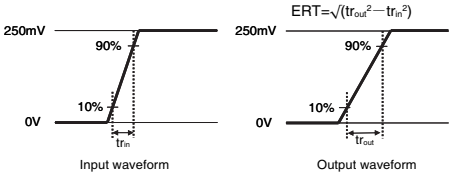
■ Electrical Characteristics (Ta = 25°C)

Item		Symbol	Minimum	Typical	Maximum	Unit	Measurement conditions
Input	LED forward voltage	V_F	1.0	1.15	1.3	V	I_F = 10 mA
	Reverse current	I_R	---	---	10	μA	V_R = 5 V
	Capacity between terminals	C_T	---	15	---	pF	V = 0, f = 1 MHz
	Trigger LED forward current	I_{FT}	---	0.5	3	mA	I_O = 100 mA
Output	Maximum resistance with output ON	R_{ON}	---	1	1.5	Ω	I_F = 5 mA, I_O = 300 mA t < 1 s
	Current leakage when the relay is open	I_{LEAK}	---	---	1	nA	V_{OFF} = 50 V, T_a = 25°C
	Capacity between terminals	C_{OFF}	---	12	---	pF	V = 0, f = 100 MHz, t < 1 s
Capacity between I/O terminals		C_{I-O}	---	0.4	---	pF	f = 1 MHz, V_s = 0 V
Insulation resistance between I/O terminals		R_{I-O}	1,000	---	---	MΩ	V_{I-O} = 500 VDC, $R_{oH} \leq 60\%$
Turn-ON time		t_{ON}	---	0.2	0.5	ms	I_F = 5 mA, R_L = 200 Ω, V_{DD} = 20 V (See note 2.)
Turn-OFF time		t_{OFF}	---	0.1	0.4	ms	
Equivalent rise time		ERT	---	40	90	ps	I_F = 5mA, V_{DD} = 0.25V, Tr(in) = 25ps (See note 3.)

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



Note: **3.** ERT (Equivalent Rise Time)



■ Recommended Operating Conditions

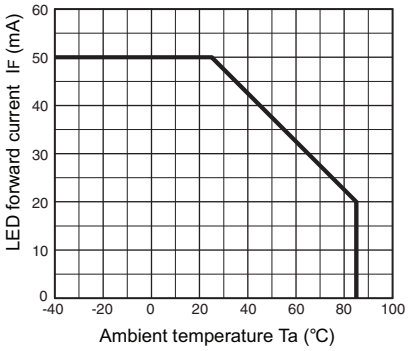
Use the G3VM under the following conditions so that the Relay will operate properly.

Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	V_{DD}	---	---	40	V
Operating LED forward current	I_F	5	7.5	20	mA
Continuous load current (AC peak/DC)	I_O	---	---	300	mA
Ambient Operating temperature	T_a	–20	---	65	°C

■ Engineering Data

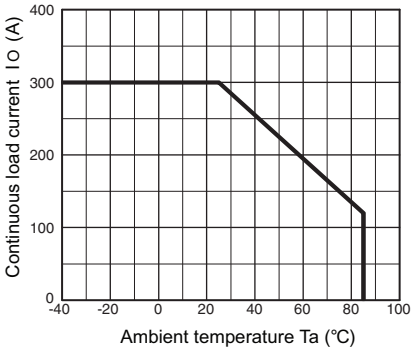
LED forward current vs. Ambient temperature

IF - Ta



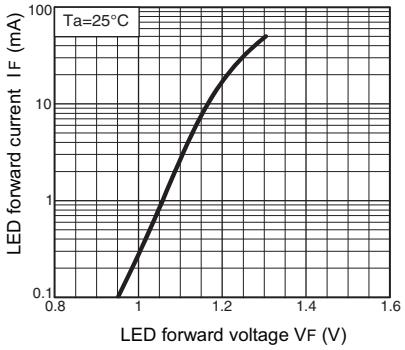
Continuous load current vs. Ambient temperature

IO - Ta



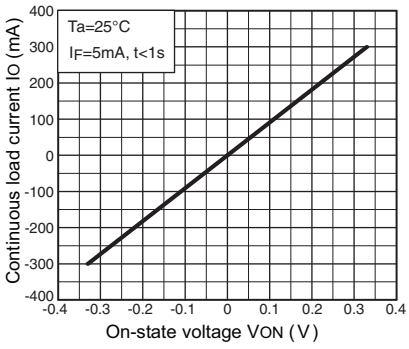
LED forward current vs. LED forward voltage

IF - VF



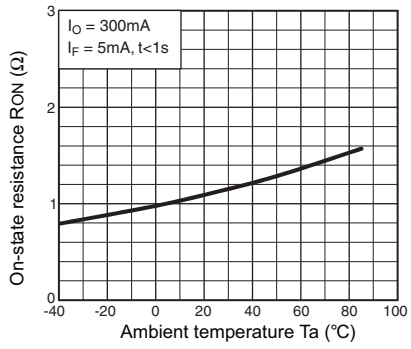
Continuous load current vs. On-state voltage

IO - VON



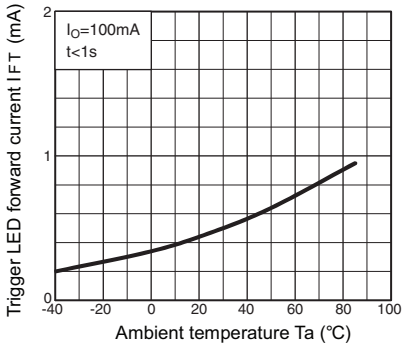
On-state resistance vs. Ambient temperature

RON - Ta



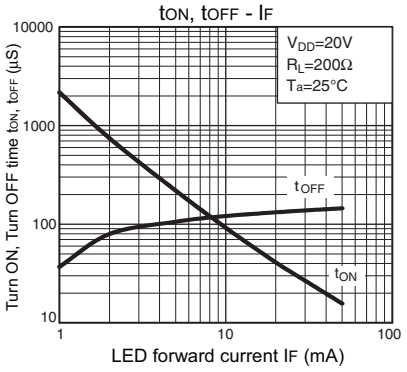
Trigger LED forward current vs. Ambient temperature

IFT - Ta



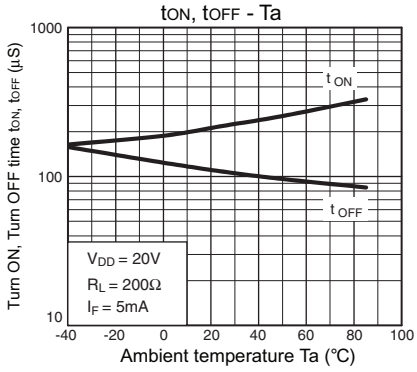
Turn ON, Turn OFF time vs. LED forward current

tON, tOFF - IF



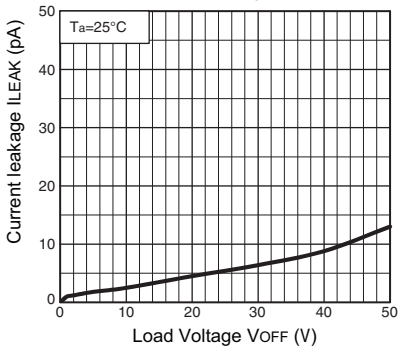
Turn ON, Turn OFF time vs. Ambient temperature

tON, tOFF - Ta



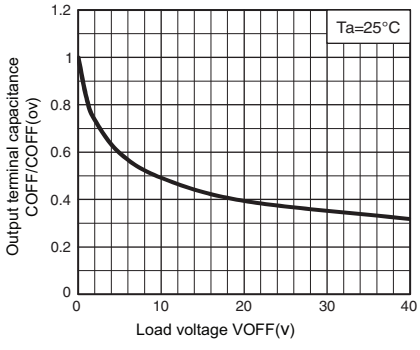
Current leakage vs. Load voltage

I LEAK – VOFF



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

COFF - VOFF



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Cat. No. K209-E-01 11/12 Specifications subject to change without notice Printed in USA