

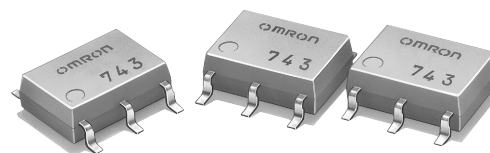
# MOS FET Relays G3VM-21HR

**Low 20-mΩ ON Resistance.  
High-power, 2.5-A Switching with SOP Package.**

- Continuous load current of 2.5 A (connection C = 5 A).
- Dielectric strength of 1,500 Vrms between I/O.
- RoHS Compliant

■ **Application Examples**

- Broadband systems
- Measurement devices
- Data loggers
- Industrial equipment



**NEW**

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

■ **List of Models**

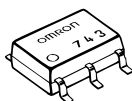
Contact form	Terminals	Load voltage (peak value) (See note.)	Model	Number per stick	Number per tape
SPST-NO	Surface-mounting terminals	20 V	G3VM-21HR	75	---
			G3VM-21HR(TR)	---	2,500

**Note:** The AC peak and DC value is given for the load voltage.

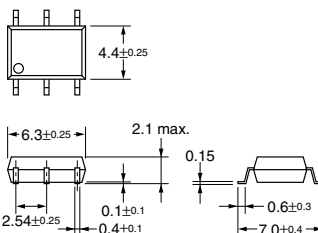
■ **Dimensions**

**Note:** All units are in millimeters unless otherwise indicated.

**G3VM-21HR**



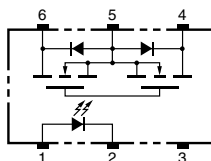
**Note:** The actual product is marked differently from the image shown here.



Weight: 0.13 g

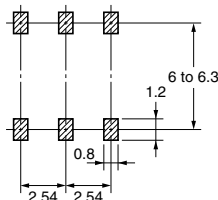
■ **Terminal Arrangement/Internal Connections (Top View)**

**G3VM-21HR**



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

**G3VM-81HR**

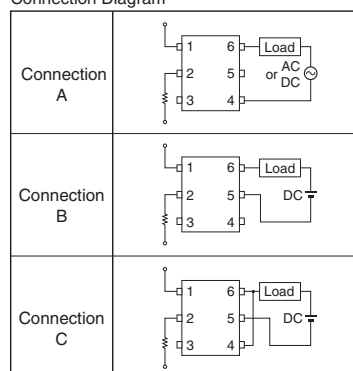


■ Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Rating	Unit	Measurement Conditions	
Input	LED forward current	$I_F$	30	mA		
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.3	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	Connection A	$I_O$	2.5	A	Connection A: AC peak/DC Connection B and C: DC
		Connection B		2.5		
		Connection C		5		
	ON current reduction rate	Connection A	$\Delta I_O/^\circ\text{C}$	-33.3	mA/°C	$T_a \geq 50^\circ\text{C}$
		Connection B		-33.3		
Connection C			-66.6			
Connection temperature		$T_J$	125	°C		
Dielectric strength between input and output (See note 1.)		$V_{I-O}$	1,500	$V_{rms}$	AC for 1 min	
Operating temperature		$T_a$	-40 to +85	°C	With no icing or condensation	
Storage temperature		$T_{stg}$	-55 to +125	°C	With no icing or condensation	
Soldering temperature (10 s)		---	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.

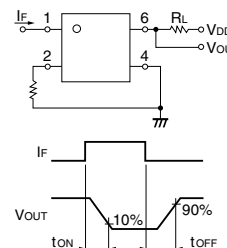
Connection Diagram



■ Electrical Characteristics (Ta = 25°C)

Item		Symbol	Minimum	Typical	Maximum	Unit	Measurement conditions	
Input	LED forward voltage	$V_F$	1.18	1.33	1.48	V	$I_F = 10 \text{ mA}$	
	Reverse current	$I_R$	---	---	10	$\mu\text{A}$	$V_R = 5 \text{ V}$	
	Capacity between terminals	$C_T$	---	70	---	pF	$V = 0, f = 1 \text{ MHz}$	
	Trigger LED forward current	$I_{FT}$	---	---	3	mA	$I_O = 100 \text{ mA}$	
Output	Maximum resistance with output ON	Connection A	$R_{ON}$	---	0.02	0.05	$\Omega$	$I_F = 5 \text{ mA}, I_O = 2 \text{ A}, t < 1 \text{ s}$
		Connection B		---	0.01	0.025	$\Omega$	$I_F = 5 \text{ mA}, I_O = 2 \text{ A}, t < 1 \text{ s}$
		Connection C		---	0.005	---	$\Omega$	$I_F = 5 \text{ mA}, I_O = 4 \text{ A}, t < 1 \text{ s}$
	Current leakage when the relay is open	$I_{LEAK}$	---	2	10	nA	$V_{OFF} = 20 \text{ V}$	
Capacity between terminals A Connection		$C_{OFF}$	---	1,000	1,500	pF	$V = 0, f = 1 \text{ MHz}$	
Capacity between I/O terminals		$C_{I-O}$	---	0.8	---	pF	$f = 1 \text{ MHz}, V_s = 0 \text{ V}$	
Insulation resistance		$R_{I-O}$	1,000	---	---	$\text{M}\Omega$	$V_{I-O} = 500 \text{ VDC}, R_{oh} \leq 60\%$	
Turn-ON time		$t_{ON}$	---	1.5	5.0	ms	$I_F = 5 \text{ mA}, R_L = 200 \Omega, V_{DD} = 10 \text{ V}$ (See note 2.)	
Turn-OFF time		$t_{OFF}$	---	0.1	1.0	ms		

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



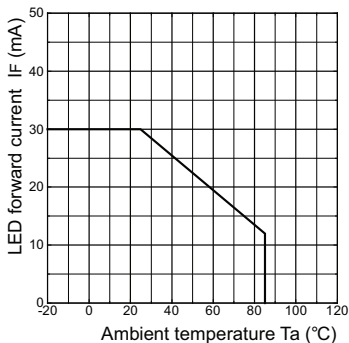
■ Recommended Operating Conditions

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

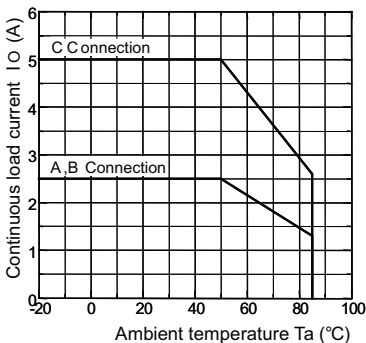
Item	Symbol	Minimum	Typical	Maximum	Unit
Load voltage (AC peak/DC)	$V_{DD}$	---	---	20	V
Operating LED forward current	$I_F$	5	10	20	mA
Continuous load current (AC peak/DC)	$I_O$	---	---	2	A
Operating temperature	$T_a$	-20	---	65	°C

■ Engineering Data

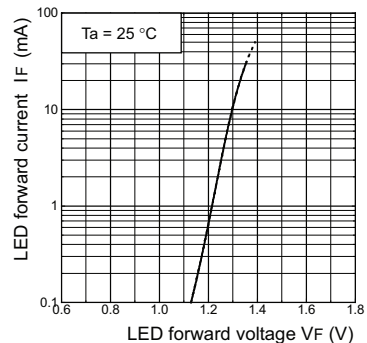
**LED forward current vs. Ambient temperature**  
IF - Ta



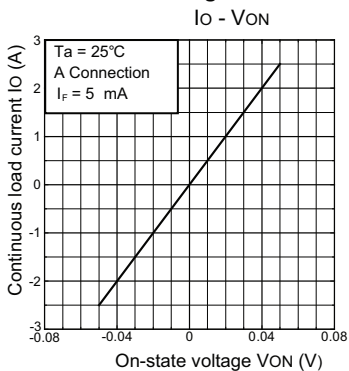
**Continuous load current vs. Ambient temperature**  
Io - Ta



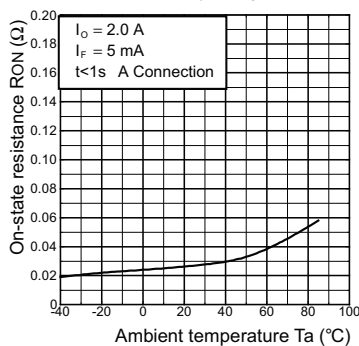
**LED forward current vs. LED forward voltage**  
IF - VF



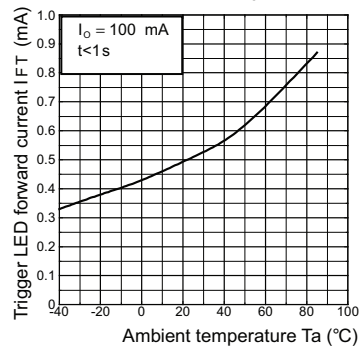
**Continuous load current vs. On-state voltage**  
Io - VON



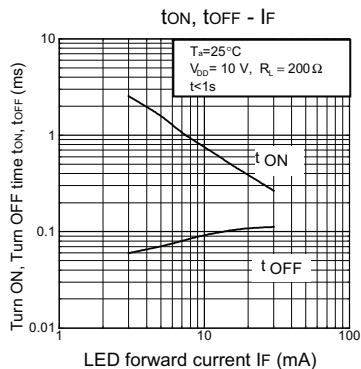
**On-state resistance vs. Ambient temperature**  
RON - Ta



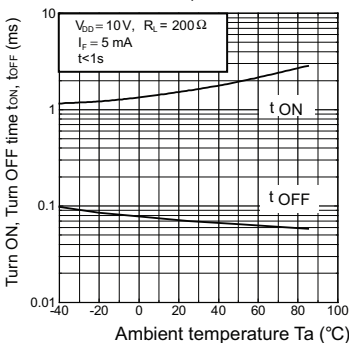
**Trigger LED forward current vs. Ambient temperature**  
IFT - Ta



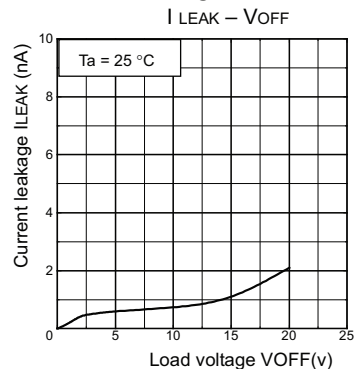
**Turn ON, Turn OFF time vs. LED forward current**  
tON, tOFF - IF



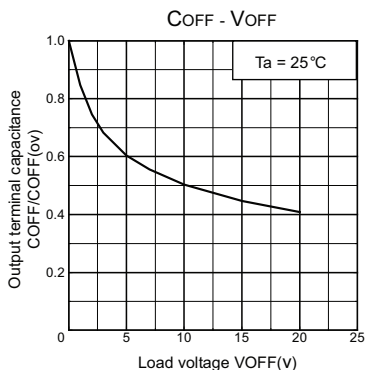
**Turn ON, Turn OFF time vs. Ambient temperature**  
tON, tOFF - Ta



**Current leakage vs. Load voltage**  
I LEAK - VOFF



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



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**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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