

# G3VM-□AY□/□DY□

MOS FET Relays Small DIP4 package with High dielectric strength type

## Small DIP4 package with Dielectric Strength of 5,000 VAC between I/O

- Load voltage 40V/60V/200V/350V/400V/600V
- Standard type: Trigger LED forward current 3mA (max.)
- High sensitive type: Trigger LED forward current 2mA (max.)



**NEW**

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

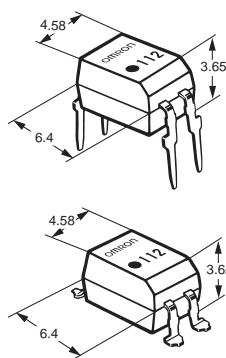
RoHS Compliant

Refer to "Common Precautions".

## Application Examples

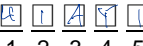
- Electrical power unit
- Security equipment
- Medical equipment
- Test & measurement equipment
- Industrial equipment

## Package (Unit : mm, Average)



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

## Model Number Legend

G3VM-  
1 2 3 4 5

### 1. Load Voltage

4: 40V

6: 60V

20: 200V

35: 350V

40: 400V

60: 600V

### 2. Contact form

1: 1a (SPST-NO)

### 3. Package type

A: DIP4 pin PCB terminals

D: DIP4 pin Surface-mounting Terminals

### 4. Additional functions

Y: Dielectric strength between I/O above 2,500V type

### 5. Other informations

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

Standard type

## Ordering Information

### Standard type

Package type	Contact form	Load voltage (peak value) *	Continuous load current (peak value) * <i>2A</i>	Packing/Tube			Packing/Tape & reel	
				Model		Minimum package quantity	Model	Minimum package quantity
				PCB terminals	Surface-mounting Terminals		Surface-mounting Terminals	
DIP4	1a	40V	2000mA	G3VM-41AY1	G3VM-41DY1	100 pcs.	G3VM-41DY1(TR05)	500 pcs.
		60V	500mA	G3VM-61AY1	G3VM-61DY1		G3VM-61DY1(TR05)	
		200V	250mA	G3VM-201AY1	G3VM-201DY1		G3VM-201DY1(TR05)	
		350V	100mA	G3VM-351AY1	G3VM-351DY1		G3VM-351DY1(TR05)	
		400V	120mA	G3VM-401AY1	G3VM-401DY1		G3VM-401DY1(TR05)	
		600V	90mA	G3VM-601AY1	G3VM-601DY1		G3VM-601DY1(TR05)	

\* The AC peak and DC value are given for the load voltage and continuous load current.

### High sensitive type

Package type	Contact form	Load voltage (peak value) *	Continuous load current (peak value) *	Packing/Tube			Packing/Tape & reel	
				Model		Minimum package quantity	Model	Minimum package quantity
				PCB terminals	Surface-mounting Terminals		Surface-mounting Terminals	
DIP4	1a	40V	2000mA	G3VM-41AY	G3VM-41DY	100 pcs.	G3VM-41DY(TR)	1,500 pcs.
		60V	500mA	G3VM-61AY	G3VM-61DY		G3VM-61DY(TR)	
		200V	250mA	G3VM-201AY	G3VM-201DY		G3VM-201DY(TR)	
		350V	100mA	G3VM-351AY	G3VM-351DY		G3VM-351DY(TR)	
		400V	120mA	G3VM-401AY	G3VM-401DY		G3VM-401DY(TR)	
		600V	90mA	G3VM-601AY	G3VM-601DY		G3VM-601DY(TR)	

\* The AC peak and DC value are given for the load voltage and continuous load current.

# **Absolute Maximum Ratings** (Ta = 25°C)

●Standard type, High sensitive type

Item		Symbol	G3VM-41AY1 G3VM-41DY1 G3VM-41AY G3VM-41DY	G3VM-61AY1 G3VM-61DY1 G3VM-61AY G3VM-61DY	G3VM-201AY1 G3VM-201DY1 G3VM-201AY G3VM-201DY	G3VM-351AY1 G3VM-351DY1 G3VM-351AY G3VM-351DY	G3VM-401AY1 G3VM-401DY1 G3VM-401AY G3VM-401DY	G3VM-601AY1 G3VM-601DY1 G3VM-601AY G3VM-601DY	Unit	Measurement conditions
Input	LED forward current	IF	30						mA	
	Repetitive peak LED forward current	IFP	1						A	100 μs pulses, 100 pps
	LED forward current reduction rate	ΔIF/°C	-0.3						mA/°C	Ta≥25°C
	LED reverse voltage	VR	5						V	
	Connection temperature	TJ	125						°C	
Output	Load voltage (AC peak/DC)	V <sub>OFF</sub>	40	60	200	350	400	600	V	
	Continuous load current (AC peak/DC)	Io	2,000	500	250	100	120	90	mA	
	ON current reduction rate	ΔIo/°C	-20	-5	-2.5	-1	-1.2	-0.9	mA/°C	Ta≥25°C
	Pulse ON current	Iop	6	1.5	0.75	0.3	0.36	0.27	A	t=100ms, Duty=1/10
	Connection temperature	TJ	125						°C	
Dielectric strength between I/O (See note 1.)		VI-o	5,000						Vrms	AC for 1 min
Ambient operating temperature		Ta	-40~+85						°C	With no icing or condensation
Ambient storage temperature		Tstg	-55~+125						°C	
Soldering temperature		—	260						°C	10s

**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.

DIP

G3VM□AY□/□DY□

Electrical Characteristics (Ta = 25°C)

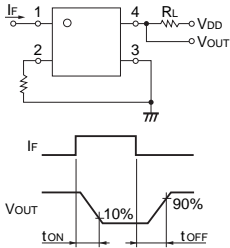
Standard type

Item			Symbol		G3VM-41AY1 G3VM-41DY1	G3VM-61AY1 G3VM-61DY1	G3VM-201AY1 G3VM-201DY1	G3VM-351AY1 G3VM-351DY1	G3VM-401AY1 G3VM-401DY1	G3VM-601AY1 G3VM-601DY1	Unit	Measurement conditions
Input	LED forward voltage	V <sub>F</sub>	Minimum	1.1						V	I <sub>F</sub> =10mA	
			Typical	1.27								
			Maximum	1.4								
	Reverse current	I <sub>R</sub>	Maximum	10						μA	V <sub>R</sub> =5V	
	Capacity between terminals	C <sub>T</sub>	Typical	50						pF	V=0, f=1MHz	
	Trigger LED forward current	I <sub>FT</sub>	Minimum	0.5	0.6				0.5	mA	G3VM-41AY1/DY1 : I <sub>o</sub> =1A Others : I <sub>o</sub> =Continuous load current ratings	
Maximum			3									
Release LED forward current	I <sub>FC</sub>	Minimum	0.1						mA	I <sub>OFF</sub> =10μA		
Output	Maximum resistance with output ON	R <sub>ON</sub>	Typical	0.09(0.06)	0.6	5	35(25)	22(17)	45(30)	Ω	I <sub>F</sub> =5mA, I <sub>o</sub> =Continuous load current ratings (value at t<1s)	
			Maximum	0.15(0.10)	2	8	50(35)	35(28)	60(40)			
	Current leakage when the relay is open	I <sub>LEAK</sub>	Maximum	1						μA	V <sub>OFF</sub> =Load voltage ratings	
	Capacity between terminals	C <sub>OFF</sub>	Typical	300	130	90	30	80	75	pF	V=0, f=1MHz	
Capacity between I/O terminals		C <sub>I-O</sub>	Typical	0.8						pF	f=1MHz, V <sub>S</sub> =0V	
Insulation resistance between I/O terminals		R <sub>I-O</sub>	Minimum	1000						MΩ	V <sub>I-O</sub> =500VDC, R <sub>oH</sub> ≤60%	
			Typical	10 <sup>8</sup>								
Turn-ON time		t <sub>ON</sub>	Typical	2.8	1		0.3	0.6	0.5	ms	G3VM-41AY1/DY1 : R <sub>L</sub> =200Ω, I <sub>F</sub> =10mA, V <sub>DD</sub> =20V G3VM-601AY1/DY1 : R <sub>L</sub> =200Ω, I <sub>F</sub> =5mA, V <sub>DD</sub> =10V Others : R <sub>L</sub> =200Ω, I <sub>F</sub> =5mA, V <sub>DD</sub> =20V (See note 2.)	
			Maximum	5	3		2					
Turn-OFF time		t <sub>OFF</sub>	Typical	0.3	0.2	0.1		0.2				
			Maximum	1								

High sensitive type

Item			Symbol		G3VM-41AY G3VM-41DY	G3VM-61AY G3VM-61DY	G3VM-201AY G3VM-201DY	G3VM-351AY G3VM-351DY	G3VM-401AY G3VM-401DY	G3VM-601AY G3VM-601DY	Unit	Measurement conditions
Input	LED forward voltage	V <sub>F</sub>	Minimum	1.45							V	I <sub>F</sub> =10mA
			Typical	1.63								
			Maximum	1.75								
	Reverse current	I <sub>R</sub>	Maximum	10							μA	V <sub>R</sub> =5V
	Capacity between terminals	C <sub>T</sub>	Typical	40							pF	V=0, f=1MHz
	Trigger LED forward current	I <sub>FT</sub>	Minimum	0.3							mA	G3VM-41AY/DY : I <sub>o</sub> =1A Others : I <sub>o</sub> =Continuous load current ratings
Maximum			2									
Release LED forward current	I <sub>FC</sub>	Minimum	0.1							mA	I <sub>OFF</sub> =10μA	
Output	Maximum resistance with output ON	R <sub>ON</sub>	Typical	0.09(0.06)	0.6	5	35(25)	22(17)	45(30)	Ω	I <sub>F</sub> =5mA, I <sub>o</sub> =Continuous load current ratings (value at t<1s)	
			Maximum	0.15(0.10)	2	8	50(35)	35(28)	60(40)			
	Current leakage when the relay is open	I <sub>LEAK</sub>	Maximum	1							μA	V <sub>OFF</sub> =Load voltage ratings
	Capacity between terminals	C <sub>OFF</sub>	Typical	300	130	90	30	80	75	pF	V=0, f=1MHz	
Capacity between I/O terminals		C <sub>I-O</sub>	Typical	0.8							pF	f=1MHz, V <sub>S</sub> =0V
Insulation resistance between I/O terminals		R <sub>I-O</sub>	Minimum	1000							MΩ	V <sub>I-O</sub> =500VDC, R <sub>oH</sub> ≤60%
			Typical	10 <sup>8</sup>								
Turn-ON time		t <sub>ON</sub>	Typical	2	0.5		0.1	0.2		ms	G3VM-601AY/DY : R <sub>L</sub> =200Ω, I <sub>F</sub> =5mA, V <sub>DD</sub> =10V Others : R <sub>L</sub> =200Ω, I <sub>F</sub> =5mA, V <sub>DD</sub> =20V (See note 2.)	
			Maximum	5	1							
Turn-OFF time		t <sub>OFF</sub>	Typical	0.3	0.2							
			Maximum	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.

### ●Standard type

Item	Symbol		G3VM-41AY1 G3VM-41DY1	G3VM-61AY1 G3VM-61DY1	G3VM-201AY1 G3VM-201DY1	G3VM-351AY1 G3VM-351DY1	G3VM-401AY1 G3VM-401DY1	G3VM-601AY1 G3VM-601DY1	Unit
Load voltage (AC peak/DC)	V <sub>DD</sub>	Maximum	32	48	160	280	320	480	V
Operating LED forward current	I <sub>F</sub>	Minimum	5						mA
		Typical	7.5						
		Maximum	25						
Continuous load current (AC peak/DC)	I <sub>O</sub>	Maximum	2000	500	250	100	120	90	
Ambient operating temperature	T <sub>a</sub>	Minimum	-20						°C
		Maximum	65						

### ●High sensitive type

Item	Symbol		G3VM-41AY G3VM-41DY	G3VM-61AY G3VM-61DY	G3VM-201AY G3VM-201DY	G3VM-351AY G3VM-351DY	G3VM-401AY G3VM-401DY	G3VM-601AY G3VM-601DY	Unit
Load voltage (AC peak/DC)	V <sub>DD</sub>	Maximum	32	48	160	280	320	480	V
Operating LED forward current	I <sub>F</sub>	Minimum	3						mA
		Typical	5						
		Maximum	15		20				
Continuous load current (AC peak/DC)	I <sub>O</sub>	Maximum	2000	500	250	100	120	90	
Ambient operating temperature	T <sub>a</sub>	Minimum	-20						°C
		Maximum	65						

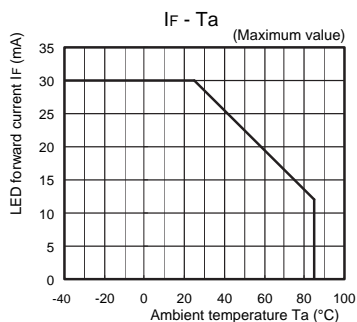
## Spacing and Insulation

### ●Standard type and High sensitive type

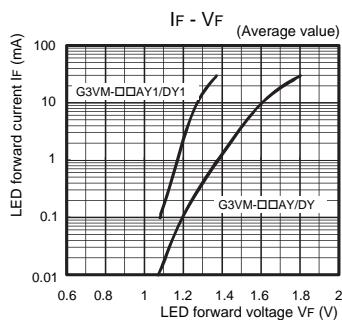
Item		Standard	Unit
Creepage distances	Minimum	7.0	mm
Clearance distances	Minimum	7.0	
Internal isolation thickness	Minimum	0.4	

## Engineering Data

●LED forward current vs.  
Ambient temperature

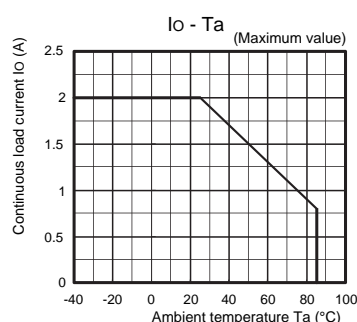
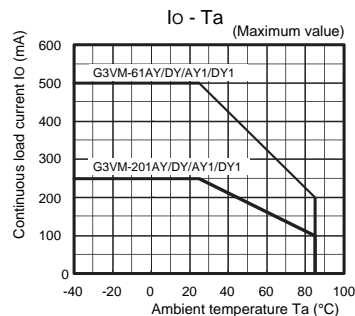
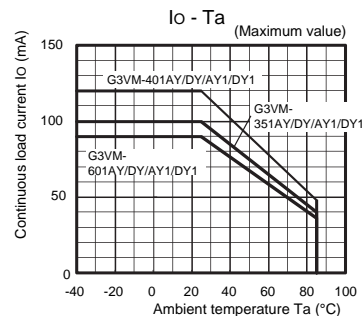


●LED forward current vs.  
LED forward voltage



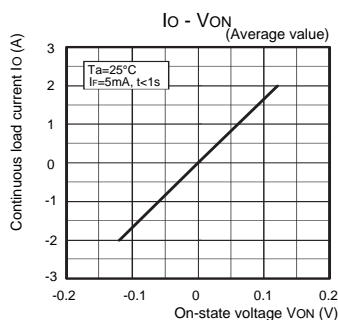
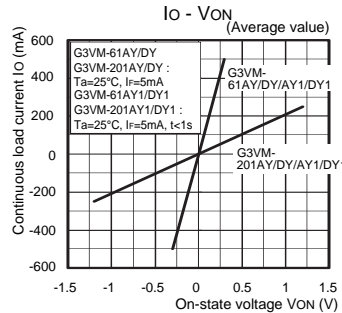
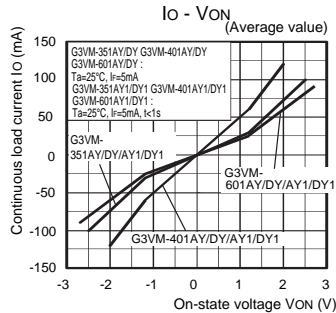
●Continuous load current vs.  
Ambient temperature

G3VM-41AY/DY/AY1/DY1

G3VM-61AY/DY/AY1/DY1  
G3VM-201AY/DY/AY1/DY1G3VM-351AY/DY/AY1/DY1  
G3VM-401AY/DY/AY1/DY1  
G3VM-601AY/DY/AY1/DY1

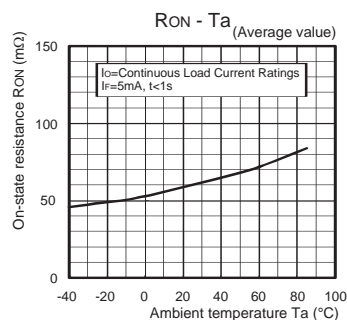
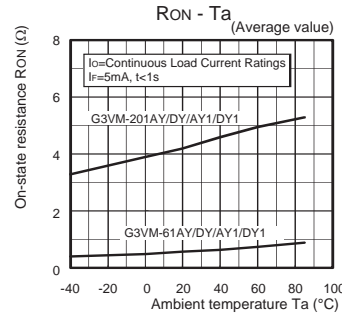
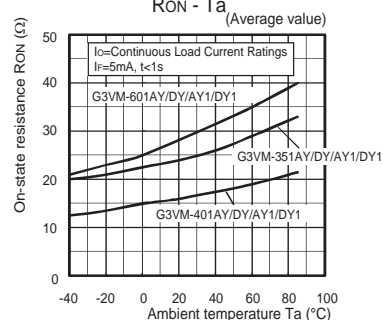
●Continuous load current vs.  
On-state voltage

G3VM-41AY/DY/AY1/DY1

G3VM-61AY/DY/AY1/DY1  
G3VM-201AY/DY/AY1/DY1G3VM-351AY/DY/AY1/DY1  
G3VM-401AY/DY/AY1/DY1  
G3VM-601AY/DY/AY1/DY1

●On-state resistance vs.  
Ambient temperature

G3VM-41AY/DY/AY1/DY1

G3VM-61AY/DY/AY1/DY1  
G3VM-201AY/DY/AY1/DY1G3VM-351AY/DY/AY1/DY1  
G3VM-401AY/DY/AY1/DY1  
G3VM-601AY/DY/AY1/DY1

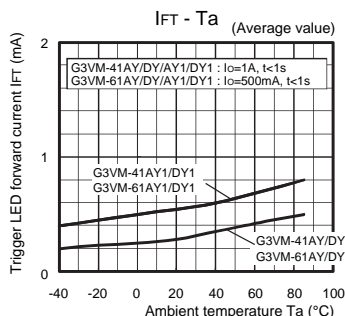
## Engineering Data

### ●Trigger LED forward current vs.

#### Ambient temperature

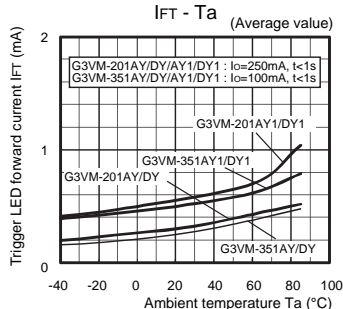
G3VM-41AY/DY/AY1/DY1

G3VM-61AY/DY/AY1/DY1



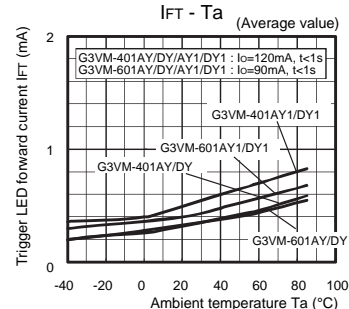
G3VM-201AY/DY/AY1/DY1

G3VM-351AY/DY/AY1/DY1



G3VM-401AY/DY/AY1/DY1

G3VM-601AY/DY/AY1/DY1

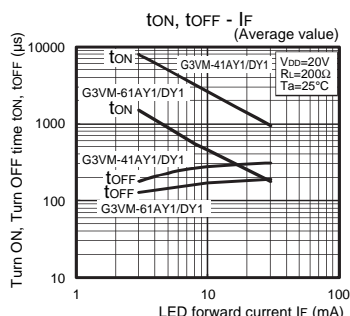


### ●Turn ON, Turn OFF time vs.

#### LED forward current

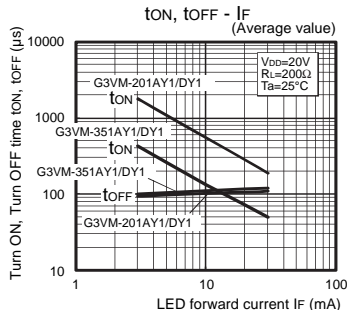
G3VM-41AY1/DY1

G3VM-61AY1/DY1



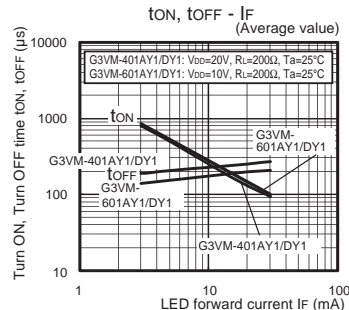
G3VM-201AY1/DY1

G3VM-351AY1/DY1



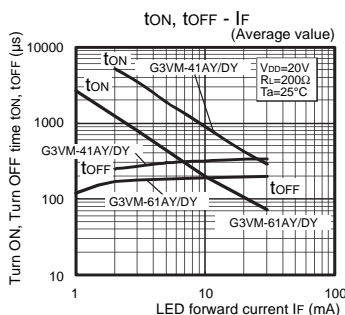
G3VM-401AY1/DY1

G3VM-601AY1/DY1



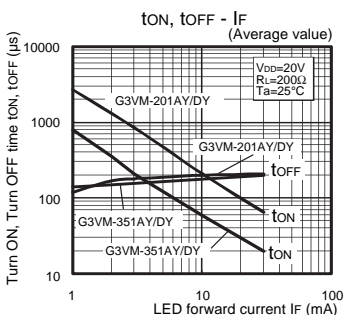
G3VM-41AY/DY

G3VM-61AY/DY



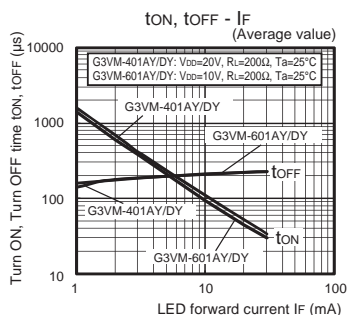
G3VM-201AY/DY

G3VM-351AY/DY



G3VM-401AY/DY

G3VM-601AY/DY

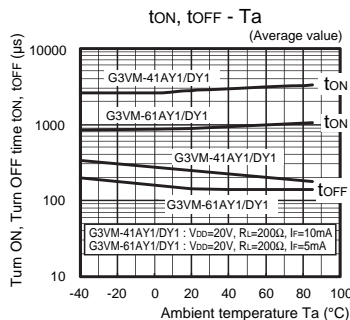


### ●Turn ON, Turn OFF time vs.

#### Ambient temperature

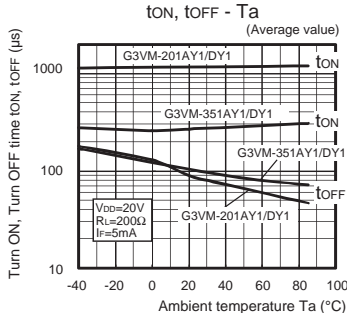
G3VM-41AY1/DY1

G3VM-61AY1/DY1



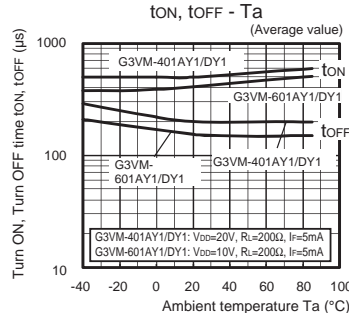
G3VM-201AY1/DY1

G3VM-351AY1/DY1



G3VM-401AY1/DY1

G3VM-601AY1/DY1

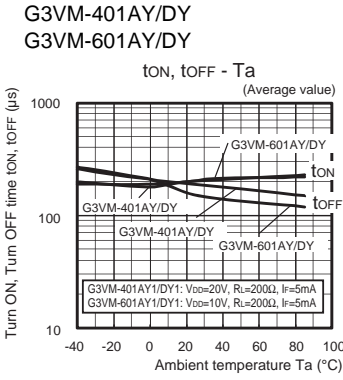
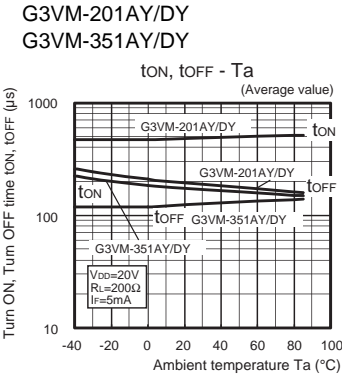
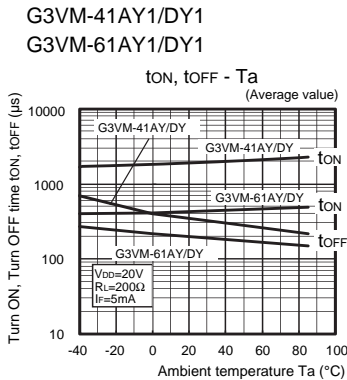


DIP

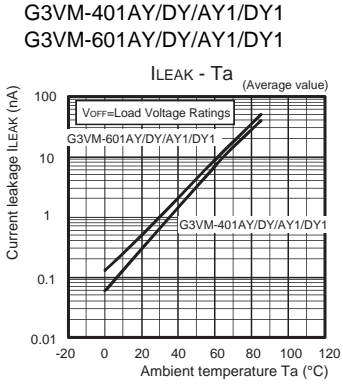
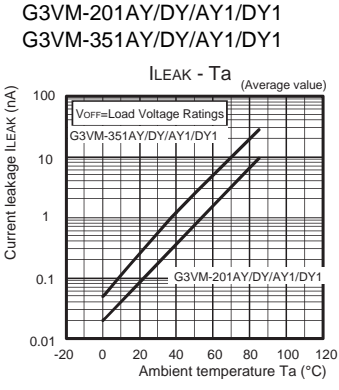
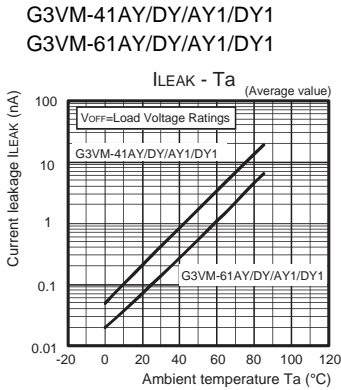
G3VM-□AY□/□DY□

Engineering Data

Turn ON, Turn OFF time vs. Ambient temperature



Current leakage vs. Ambient temperature

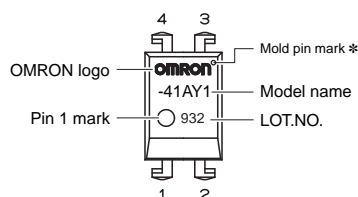


## ■Apperance/Terminal Arrangement/Internal Connections

### ■Apperance

#### DIP (Dual Inline Package)

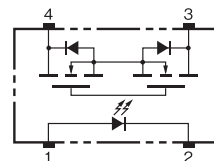
DIP4



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

\* The indentation in the corner diagonally opposite from the pin 1 mark is from a pin on the mold.

### ■ Terminal Arrangement/Internal Connections

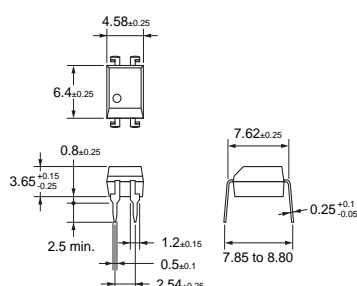


## ■Dimensions (Unit: mm)



#### PCB Terminals

Weight: 0.25 g

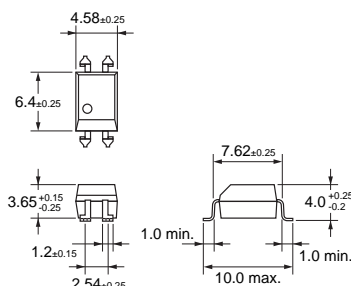


Note: The actual product is marked differently from the image shown here.

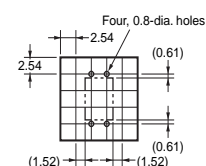


#### Surface-mounting Terminals

Weight: 0.25 g

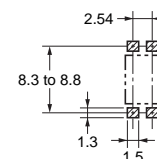


#### PCB Dimensions (BOTTOM VIEW)



#### Actual Mounting Pad Dimensions

(Recommended Value, TOP VIEW)



## ■Approved Standards

UL recognized

### ●Standard type and High sensitive type

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

## ■Safety Precautions

- Refer to "Common Precautions" for all G3VM models.

• Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.

• Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

Note: Do not use this document to operate the Unit.

OMRON Corporation

Electronic and Mechanical Components Company

Contact: [www.omron.com/ecb](http://www.omron.com/ecb)

Cat. No. K275-E1-02  
0215(0115)(O)