G6DN

PCB Power Relay

SPST Slim Power Relay for 5 A switching

- Slim 5-mm width and miniature size. (20 × 5.08 × 12.5 mm)
- High switching capability 5 A (250 VAC and 30 VDC), and high contact reliability by crossbar-twin contact.
- Low power consumption 110 mW.
- Meets application standards EN61010-1 and EN61010-2-201 for reinforced insulation (CTI 600 V min. and Rated insulation voltage 300 V). (Except G6DN-1A-CF Models)
- Actualize electrical durability 100 Kops (-L type)
- Lineup of high temperature types with an ambient temperature of 105°C (-CF type)

■Model Number Legend

G6DN-□□□-□□

1 2 3 4 5

1. Number of Poles
1: 1-pole

2. Contact Form
A: SPST-NO (1a)

3. Enclosure Rating
None: Fully sealed

4. Classification
None: Standard (E-LIFE 80 Kops)
L: High durability type (E-LIFE 100 Kops)
SL: General purpose

5. Coil Insulation Class
None: Class B
CF: Class F (High temperature)

■Application Examples

- Programmable Controller output
- Temperature Controller
- Building Automation
- Output of control system

■Ordering Information

Classification	Contact form	Enclosure rating	Terminal shapes	Model	Minimum packing unit
Standard	SPST-NO (1a)	Fully sealed	PCB terminal	G6DN-1A	25 pcs/ tube
High durability				G6DN-1A-L	
General purpose				G6DN-1A-SL	100pcs/tray
High temperature				G6DN-1A-CF	

Note 1. When ordering, add the rated coil voltage to the model number.
Example: G6DN-1A DC5
Rated coil voltage

However, the notation of the coil voltage on the product case as well as on the packaging will be marked as □□ VDC.
Example: G6DN-1A 5VDC

Note 2. When placing an order, please specify the number in package multiples.

■Ratings

●Coil

Classification	Rated voltage	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V) % of rated voltage	Must release voltage (V) % of rated voltage	Max. voltage (V) % of rated voltage	Power consumption (mW)
Standard	4.5 VDC	24.4	184	70% max. *	5% min.	160%	Approx. 110
	5 VDC	22.0	227				
	12 VDC	9.2	1,309				
	24 VDC	4.6	5,236				
High durability	5 VDC	36.0	139				Approx. 180
	12 VDC	15.0	800				
	24 VDC	7.5	3,200				
General purpose	5 VDC	22.0	227				Approx. 110
	12 VDC	9.2	1,309				
	24 VDC	4.6	5,236				
High temperature	4.5 VDC	24.4	184				
	5 VDC	22.0	227				
	12 VDC	9.2	1,309				
	24 VDC	4.6	5,236				

Note. The rated current and resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
* Operating voltage is less than 72% when the relay is sideways and the marking is right way.

●Contacts

Item / Classification	Standard High durability General purpose		High temperature	
Load	Resistive load	Inductive load (cos ϕ = 0.4)(L/R = 7 ms)	Resistive load	Inductive load (cos ϕ = 0.4)(L/R = 7 ms)
Contact Type	Cross bar twin			
Contact material	Ag-Alloy and Au plating *			
Rated load	5 A at 250 VAC 5 A at 30 VDC	2 A at 250 VAC 2 A at 30 VDC	5 A at 250 VAC 5 A at 30 VDC	1 A at 250 VAC 2 A at 30 VDC
Rated carry current	5 A			
Max. switching voltage	277 VAC, 125 VDC			
Max. switching current	5 A			

* Au plating is applied to stationary contact.

■Characteristics

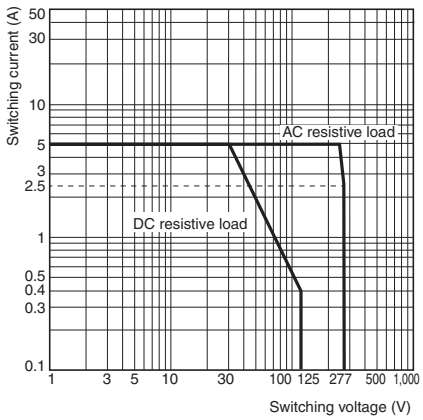
		Standard	High durability	General purpose	High temperature
Contact resistance *1		100 mΩ max.			
Operate time		10 ms max.			
Release time		5 ms max.			
Insulation resistance *2		1,000 MΩ min. (at 500 VDC)			
Dielectric strength	Between coil and contacts	3,000 VAC, 50/60 Hz for 1 min			
	Between contacts of the same polarity	750 VAC, 50/60 Hz for 1 min			
Surge withstand voltage	Between coil and contacts	6 kV (1.2 × 50 μs)			
Vibration resistance	Destruction	10 to 55 to 10 Hz, 2.5 mm single amplitude (5.0 mm double amplitude)			
	Malfunction	10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)			
Shock resistance	Destruction	1,000 m/s²			
	Malfunction	100 m/s²			
Durability	Mechanical	20,000,000 operations min. (at 18,000 operations/hr)			
	Electrical	100,000 operations min. (3 A at 250 VAC, 3 A at 30 VDC Resistive load) 80,000 operations min. (5 A at 250 VAC, 5 A at 30 VDC Resistive load) 100,000 operations min. (2 A at 250 VAC, 2 A at 30 VDC Inductive load)	100,000 operations min. (5 A at 250 VAC, Resistive load) 100,000 operations min. (5 A at 30 VDC, Resistive load) 200,000 operations min. (2 A at 250 VAC, Inductive load) 200,000 operations min. (2 A at 30 VDC, Inductive load)	50,000 operations min. (5 A at 250 VAC, Resistive load) 50,000 operations min. (5 A at 30 VDC, Resistive load) 100,000 operations min. (2 A at 250 VAC, Inductive load) 100,000 operations min. (2 A at 30 VDC, Inductive load)	10,000 operations min. (5 A at 250 VAC Resistive load 105°C) 100,000 operations min. (3 A at 250 VAC Resistive load 105°C) 10,000 operations min. (5 A at 30 VDC Inductive load 105°C) 100,000 operations min. (3 A at 30 VDC Resistive load 105°C) 100,000 operations min. (1 A at 250 VAC Inductive load 105°C) 100,000 operations min. (2 A at 30 VDC Inductive load 105°C)
Failure rate (P level) (reference value *3)		0.1 mA at 0.1 VDC			
Ambient temperature	Operating	-40°C to +90°C (with no icing or condensation)			-40°C to +105°C *4 (with no icing or condensation)
Humidity		5% RH to 85% RH			
Weight		Approx. 3 g			

Note. This value was measured at a switching frequency of 120 operations/min.
*1. Values in the above table are initial values.
*2. The contact resistance is measured with 1 A applied at 5 VDC using a fall-of-potential method.
*3. The insulation resistance is measured between coil and contacts and between contacts of the same polarity at 500 VDC.
*4. For installation, please see "●Mounting" on page 6.

■Engineering Data

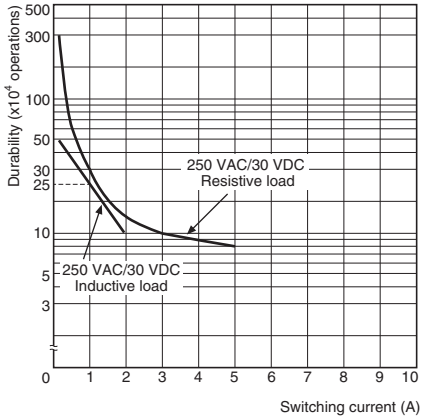
●Maximum Switching Capacity

●G6DN-1A, G6DN-1A-L, G6DN-1A-CF



●Durability

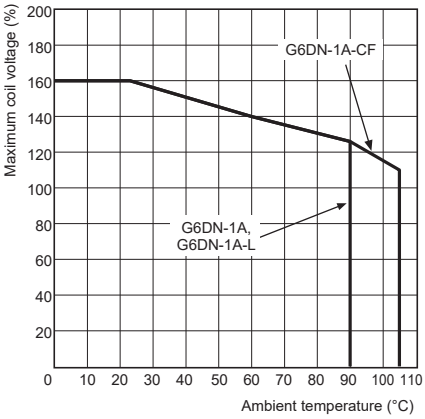
●G6DN-1A, G6DN-1A-CF



Note. The durability curve is based on room temperature data.

●Ambient Temperature vs. Maximum Coil Voltage

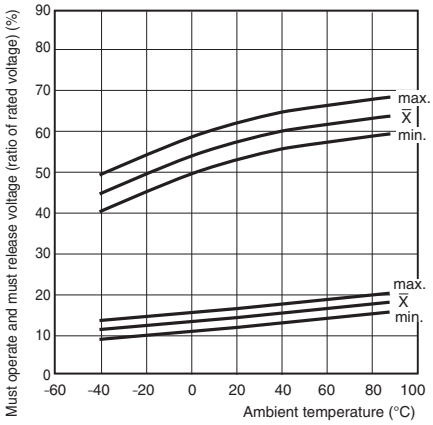
●G6DN-1A, G6DN-1A-L, G6DN-1A-CF



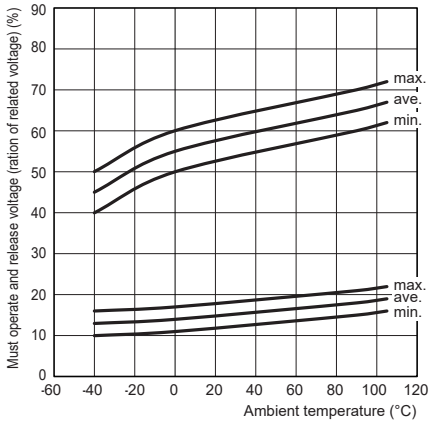
Note. The maximum coil voltage refers to the maximum voltage in a varying range of operating power voltage, not a continuous voltage.

●Ambient Temperature vs. Must Operate and Must Release Voltages

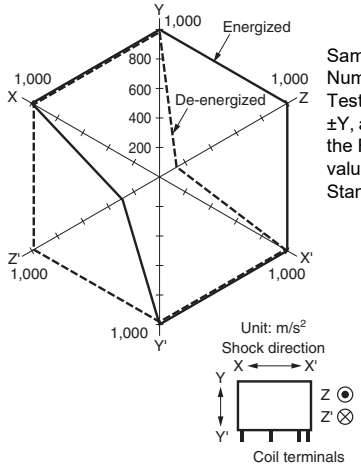
G6DN-1A, G6DN-1A-L



G6DN-1A-CF



●Shock Malfunction

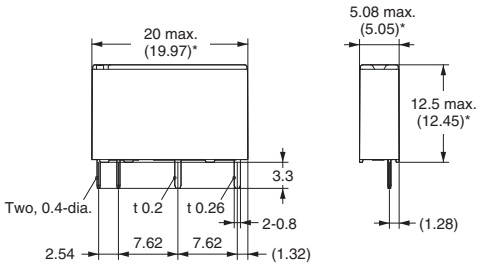


Sample: G6DN-1A
Number of Relays: 5 pcs
Test conditions: Impose a shock in the ±X, ±Y, and ±Z directions three times each with the Relay energized to check the shock values that cause the Relay to malfunction.
Standard:100 m/s²

■Dimensions

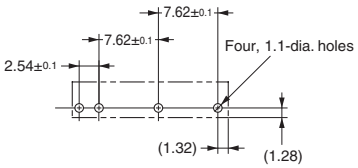
CAD Data Please visit our website, which is noted on the last page.

G6DN-1A(-L)

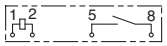


* Average value

PCB Mounting Holes
(Bottom View)



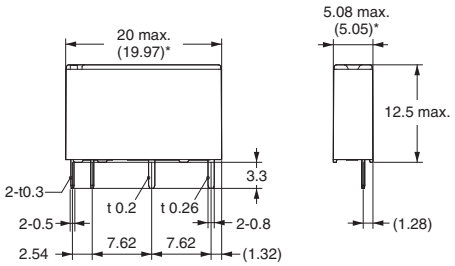
Terminal Arrangement/ Internal Connections
(Bottom View)



(No coil polarity)

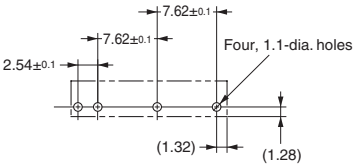
CAD Data

G6DN-1A(-SL)(-CF)

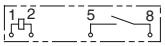


* Average value

PCB Mounting Holes
(Bottom View)



Terminal Arrangement/ Internal Connections
(Bottom View)



(No coil polarity)

CAD Data

■Approved Standards

●The rated values approved by each of the safety standards may be different from the performance characteristics individually defined in this datasheet.

UL/C-UL-approved models (File No. E41515)

Model	Contact form	Coil ratings	Contact ratings	Operations
G6DN-1A(-SL)(-CF)	SPST-NO	4.5 to 24 VDC	5 A at 277 VAC (Resistive) 95°C	6,000
			5 A at 30 VDC (Resistive) 90°C	6,000
			3A, 250V ac, Resistive 85°C	100,000
			1/10 hp 125 VAC 95°C	1,000
			1/10 hp 277 VAC 95°C	1,000
			D300 120 VAC/240 VAC 95°C	6,000
			C300 120 VAC/240 VAC 95°C	6,000
			R300 125 VDC/250 VDC 95°C	6,000
			5 A 250 VAC (Resistive) 105°C	10,000
			5 A 30 VDC (Resistive) 105°C	10,000
G6DN-1A-L	SPST-NO	5 to 24 VDC	5 A 250 VAC (Resistive) 95°C	100,000
			2 A 250 VAC (General Use) 95°C	100,000
			2 A 30 VDC (General Use) 95°C	100,000
			1/10 hp 120 VAC 40°C	6,000
			C300 120 VAC/240 VAC 95°C	6,000
			D150 120 VAC 95°C	6,000
			R150 125 VDC 95°C	6,000

Note. CSA certification CSA 22.2 No.14 can be recognized by C-UL.

VDE (EN61810-1) (Certificate No. 40042696)

Model	Contact form	Coil ratings	Contact ratings	Operations
G6DN-1A	SPST-NO	4.5, 5, 12, 24 VDC	5 A at 250 VAC (cosϕ= 1.0) 90°C	10,000
			5 A at 30 VDC (L/R = 0 ms) 90°C	10,000
G6DN-1A-L	SPST-NO	5, 12, 24 VDC	5 A 250 VAC (cosϕ= 1.0) 90°C	100,000
			2 A 250 VAC (cosϕ= 0.4) 90°C	100,000
			2 A 250 VAC (cosϕ= 0.6) 90°C	100,000
			5 A 30 VDC (L/R = 0 ms) 90°C	100,000
			2 A 30 VDC (L/R = 7 ms) 90°C	100,000

TÜV (EN61810-1) (Registration No. R 50396359)

Model	Contact form	Coil ratings	Contact ratings	Operations
G6DN-1A(-SL)(-CF)	SPST-NO	5, 12, 24 VDC	5 A at 250 VAC (cosϕ= 1.0) 90°C	10,000
			5 A at 30 VDC (L/R = 0 ms) 90°C	10,000
			5 A at 250 VAC (cosϕ= 1.0) 105°C	10,000
			5 A at 30 VDC (cosϕ= 1.0) 105°C	10,000

Clearance distance	3.5 mm min.
Creepage distance	3.6 mm min.
Type of insulation coil-contact circuit	Basic (PD.2)
open contact circuit	Micro disconnection
Rated Insulation voltage	300 V
Pollution degree	2
Rated voltage system	250 V
Over voltage category	II
Category of protection according to IEC 61810-1	RT III (Sealed)
Insulation material group	I
Tracking resistance according to IEC 60112	CTI 600 V min.
Flammability class according to UL94	V-0
Coil insulation system according to UL	Class B (Standard/High durability/General purpose)/Class F (High temperature)

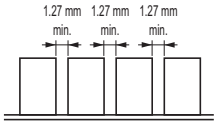
■Precautions

●Please refer to “PCB Relays Common Precautions” for correct use.

Correct Use

●Mounting

When mounting a number of relays on a PCB in 90°C to 105°C, be sure to provide a minimum mounting space of 1.27 mm min. as shown below.



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