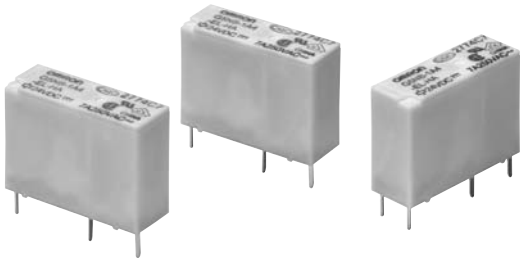
G5NB-EL

PCB Power Relay

A slim compact Relay with 7 A switching capacity



- 7 A (250 VAC), 5 A (30 VDC) high capacity switching with compact size.
- Minimum 200,000 operations durability at 5 A (250 VAC) switching.
- IEC/EN 60335-1 conformed.
- Ambient operating temperature: max. 85°C. (-CF type 105°C)
- Conforms to IEC/EN60079-1, IEC/EN60079-15.
  (IEC/EN) 60079-1 clause 15.5 Enclosed-break devices (Group IIA) testing passed.
  (IEC/EN) 60079-15 clause 11.2 Sealed devices testing passed.

■Model Number Legend

G5NB-□□□-□-□-□-□-□-□
1 2 3 4 5 6 7 8 9

1. Number of Poles
1 : 1-pole

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

3. Enclosure rating
None : Flux protection
4 : Sealed

4. Classification
EL : High capacity and electrical durability

5. Conformity standard
HA : IEC/EN 60335-1 conformed

6. Coil Insulation Class (UL 1446)
None : Class B
CF : Class F

7. Coil Holding Voltage
None : Not supported
PW : Supported

8. High temperature rating
A85 : High temperature rating at 85°C (Flux protection)

9. Packing
None : Tray Packing
SP : Tube Packing

■Application Examples

- Home appliances
- Industrial equipment
- Building automation
- Heat pump

■Ordering Information

Classification	Contact form	Enclosure rating	Model	Rated coil voltage	Minimum packing unit
Single stable relay	SPST-NO (1a)	Fully Sealed	G5NB-1A4-EL-HA(-SP)	DC5,12,24V	100pcs./Tray 50pcs./Tube
			G5NB-1A4-EL-HA-PW(-SP)		
			G5NB-1A4-EL-HA-CF(-SP)		
		Flux protection	G5NB-1A-EL-HA-A85		100pcs./Tray

Note 1. When ordering, add the rated coil voltage to the model number.
Example: G5NB-1A4-EL-HA DC12
Rated coil voltage
However, the notation of the coil voltage on the product case as well as on the packing will be marked as □□ VDC.
Note 2. When ordering tape packing, add "-SP" to the model number.
Be sure since "-SP" is not part of the relay model number, it is not marked on the relay case.

■Ratings

●Coil

Rated voltage	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
5 VDC	40	125	75% max.	10% min. 10 to 39%*	160% (at 23°C)	Approx. 200 Approx. 50*
12 VDC	16.7	720				
24 VDC	8.3	2880				

Note 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
Note 2. The operating characteristics are measured at a coil temperature of 23°C.
Note 3. The “Max. voltage” is the maximum voltage that can be applied to the relay coil.
* These numbers are only for -PW type. Power consumption with Holding Voltage is approx.50mW. Please confirm the detail in page 4 Coil Voltage Reduction (Holding Voltage).

●Contacts

Item / Load	Resistive load
Contact Type	Single
Contact material	Ag-alloy (Cd free)
Rated load	5 A at 250 VAC, 7 A at 250 VAC
	5 A at 30 VDC
Rated carry current	5 A at DC, 7 A at AC
Max. switching voltage	250 VAC, 30 VDC
Max. switching current	5 A at DC, 7 A at AC

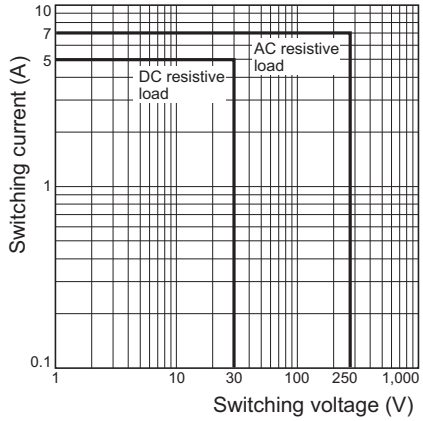
■Characteristics

Contact resistance *1		100 mΩ max.
Operate time		10 ms max.
Release time		10 ms max.
Insulation resistance *2		1,000 MΩ min.
Dielectric strength	Between coil and contacts	4,000 VAC, 50/60 Hz for 1 min
	Between contacts of the same polarity	750 VAC, 50/60 Hz for 1 min
Insulation distance	Between coil and contacts	Clearance: 6 mm, Creepage: 6 mm
Impulse withstand voltage	Between coil and contacts	10 kV (1.2 x 50 μs)
Vibration resistance	Destruction	10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 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	5,000,000 operations min.
	Electrical (resistive load)	• Standard, Coil holding voltage type 200,000 operations at 250 VAC, 5 A 50,000 operations at 250 VAC, 7 A 100,000 operations at 30 VDC, 5 A • High temperature rating type (G5NB-1A-EL-HA-A85) 100,000 operations at 250 VAC, 5 A at 85°C 50,000 operations at 250 VAC, 7 A at 85°C
Failure rate (P level) (reference value) *3		DC5V 10mA
Ambient operating temperature		-40°C to 85°C (with no icing or condensation) -40°C to 105°C (with no icing or condensation) (-CF Type)
Ambient operating humidity		5% to 85%
Weight		Approx. 4 g

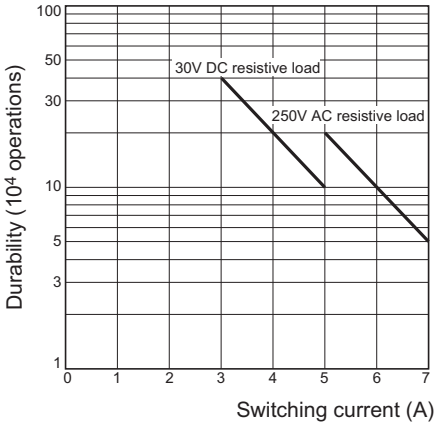
Note. The data shown above are initial value.
*1. Measurement conditions: 5 VDC, 1 A, voltage drop method
*2. Measurement conditions: Measured at the same points as the dielectric strength using a 500 VDC ohmmeter.
*3. This value was measured at a switching frequency of 120 operations/min.

■Engineering Data

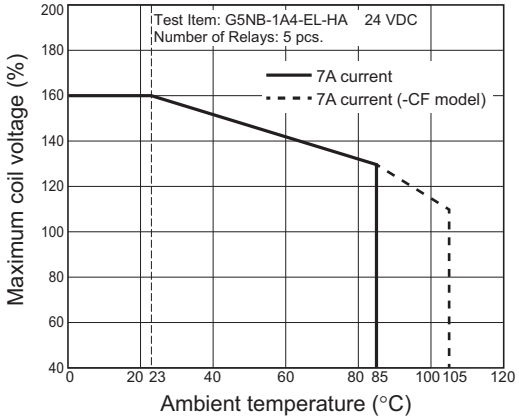
●Maximum Switching Capacity



●Durability

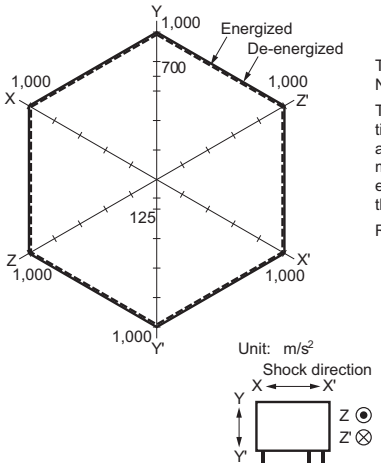


●Ambient Temperature vs. Maximum Coil Voltage



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

●Shock malfunction



Test Item: G5NB-1A4-EL-HA 24 VDC
Number of Relays: 5 pcs

Test Method: Shock is applied 3 times in 6 directions along 3 axes and the level at which shock caused malfunction is measured. The energized voltage should be 100% of the rated voltage.

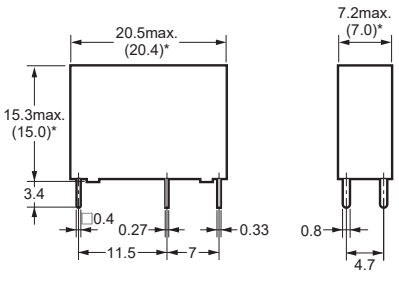
Rating: 100 m/s²

■Dimensions

CAD Data marked products, 2D drawings and 3D CAD models are available.
For CAD information, please visit our website, which is noted on the last page.

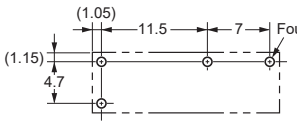
(Unit: mm)

G5NB-1A4-EL-HA(-PW)
G5NB-1A-EL-HA-A85
G5NB-1A4-EL-HA-CF

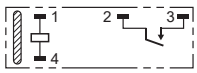


*Average value

PCB Mounting Holes
(Bottom View)
Tolerance: ±0.1 mm



Terminal Arrangement/ Internal Connections
(Bottom View)



(No coil polarity)

CAD Data

■Approved Standards

The approval rating values for overseas standards are different from the performance values determined individually. Confirm the values before use.

●UL Recognized: (File No. E41515)
CSA Certified: (File No. LR31928)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G5NB-1A4-EL-HA(-PW) G5NB-1A-EL-HA-A85	SPST-NO (1a)	5 to 24 VDC	7 A 250 VAC (General Purpose) 85°C	30,000
			5 A 250 VAC (General Purpose) 85°C	50,000
			5 A 30 VDC (Resistive) 85°C	6,000
G5NB-1A4-EL-HA-CF	SPST-NO (1a)	5 to 24 VDC	7 A 250 VAC (General Purpose) 85°C	30,000
			5 A 250 VAC (Resistive) 105°C	50,000
			2 FLA/12 LRA 250 VAC 105°C	30,000
			5 A 30 VDC (Resistive) 85°C	6,000
			5 A 250 VAC (Resistive) 85°C	100,000
			B300 Pilot duty, 85°C	30,000
			C300 Pilot duty, 105°C	30,000

●EN/IEC, VDE Certified (Certificate No. 137575)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G5NB-1A4-EL-HA(-PW) G5NB-1A-EL-HA-A85	SPST-NO (1a)	5, 12, 24 VDC	7 A 250 VAC (Resistive) 85°C	10,000
			5 A 30 VDC (Resistive) 85°C	
G5NB-1A4-EL-HA-CF	SPST-NO (1a)	5, 12, 24 VDC	7 A 250 VAC (Resistive) 85°C	10,000
			5 A 30 VDC (Resistive) 85°C	
			5 A 250 VAC (Resistive) 105°C	50,000
			5 A 250 VAC (Resistive) 85°C	100,000

Conformed ratings of application standard

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G5NB-1A4-EL-HA-CF	SPST-NO (1a)	5, 12, 24 VDC	5(2) A 250 VAC -40/85°C (EN/IEC60730-1)	100,000
			3(1) A 250 VAC -40/105°C (EN/IEC60730-1)	100,000

●Regarding IEC/EN60079-1, -15

Type of protection: Enclosed-break devices (Group IIA*) (IEC/EN) 60079-1 clause 15.5 testing passed.

Type of protection: Sealed devices (IEC/EN) 60079-15 clause 11.2 testing passed.

*Gas protection group definition

– Group IIA: (55 ± 0.5) % hydrogen/air at atmospheric pressure;
– Group IIB: (37 ± 0.5) % hydrogen/air at atmospheric pressure;
– Group IIC: (40 ± 1) % hydrogen, (20 ± 1) % oxygen and the remainder nitrogen at atmospheric pressure or alternatively (27.5 ± 1.5) % hydrogen/air at an overpressure at a pressure equal to 1.5 times atmospheric pressure.

Please contact your local OMRON representative for more details on the standards.

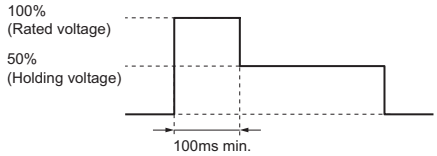
■Precautions

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

Correct Use

●Coil Voltage Reduction (Holding Voltage) after Relay operation

- If the coil voltage is reduced to the holding voltage after Relay operation, first apply the rated voltage to the coil for at least 100 ms, as shown below.
- A voltage of at least 50% of the rated voltage is required for the coil holding voltage. Do not allow voltage fluctuations to cause the coil holding voltage to fall below this level.



	Applied coil voltage	Coil resistance*	Power consumption
Rated voltage	100%	125Ω (5 VDC) 720Ω (12 VDC) 2880Ω (24 VDC)	Approx.200 mW
Holding voltage	50%		Approx.50 mW

* The coil resistance were measured at a coil temperature of 23°C with tolerances of ±10%.

■Other data

Creepage distance	6.0 mm
Clearance distance	6.0 mm
Insulation Material Group	III a
Type of insulation coil-contact circuit	Reinforced
open contact circuit	Micro disconnection
Rated Insulation Voltage	250V
Pollution degree	3
Rated voltage system	250V
Overvoltage category	III
Category of protection according to IEC 61810-1	RT III
Glow wire according to IEC 60335-1	<HA Models only> GWT 750°C min. (IEC 60695-2-11) / GWFI 850°C min. (IEC 60695-2-12)
Tracking Index of relay base	PTI 250V min. (housing Parts)
Flammability class according to UL94	V-0

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