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G7EB

PCB Power Relays

High Power and High Temperature Type Power Relay with 480 VAC 100 A Current



- 480 VAC/100 A high current switching
- 60 VDC/100 A for normal/reverse direction switching
- Ambient temperature 85°C
- High impulse withstand voltage, 10 kV
- Contact gap ≥3.6 mm (Applied to VDE0126)
- Low initial contact resistance ≤5 mΩ

RoHS Compliant

Model Number Legend

G7EB-□□□
1 2 3

1. Number of Poles
   1: 1-pole
2. Contact Form
   A: SPST-NO (1a)
3. Terminal Shape
   None: Standard type
   P1: Special terminal type

Application Examples

- Power conditioner inverter
- Industrial inverter
- UPS

Ordering Information

Terminal shape	Contact form	Enclosure rating	Model	Rated coil voltage (V)	Minimum packing unit
Standard	SPST-NO (1a)	Flux protection	G7EB-1A	12 VDC 24 VDC	60pcs/box
Special			G7EB-1AP1		

Note. When ordering, add the rated coil voltage to the model number.

Example: G7EB-1A DC12
└ Rated coil voltage

Both the coil voltage on the product case and the packing will be marked as □□VDC.

Ratings

● Coil

Rated voltage	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
			% of rated voltage			
12 VDC	Approx. 235.3	51	75% max. *	5 to 32%	120% (at 23°C)	Approx. 2,800 Approx. 575 *
24 VDC	Approx. 116.5	206				

Note 1. The rated current and 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 maximum permissible voltage is the maximum value of the fluctuation range for the relay coil operating power supply and was measured at an ambient temperature of 23°C.
Note 4. Use this relay with coil voltage reduction.
* Power consumption with Holding Voltage is approx. 575 mW (when applying Holding Voltage at 45%). Please confirm the details on page 4, under ●Coil Voltage Reduction (Holding Voltage) after Relay Operation.
* Some mounting directions are not guaranteed. Please confirm the detail in page 4 ●Mounting Direction.

● Contacts

Item	Resistive load
Contact type	Double
Contact material	Ag Alloy (Cd free)
Rated load	100 A at 480 VAC, 40A at 800 VAC 100 A at 60 VDC, 50 A at 60 VDC, 40 A at 60 VDC
Rated carry current	100 A
Max. switching voltage	800 VAC, 60 VDC
Max. switching current	100 A

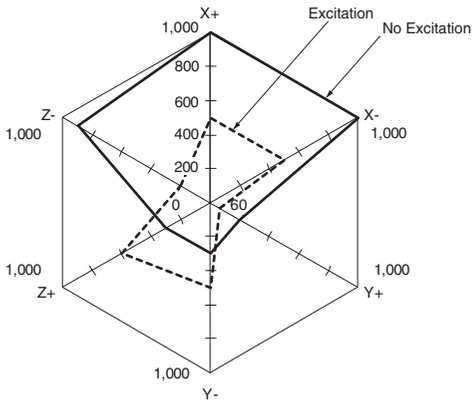
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Characteristics

Item	Model	G7EB-1A/G7EB-1AP1
Contact resistance *1		5 mΩ max.
Operate time *2		30 ms max.
Release time *2		10 ms max.
Insulation resistance *3		1,000 MΩ min.
Dielectric strength	Between coil and contacts	5,000 VAC, 50/60 Hz for 1 min
	Between contacts of the same polarity	2,000 VAC, 50/60 Hz for 1 min
Impulse withstand voltage		Between coil and contacts 10 kV (1.2 × 50 μs)
Vibration resistance	Destruction	10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)
	Malfunction	Excitation: 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) No excitation: 10 to 55 to 10 Hz, 1.5 mm single amplitude (0.3 mm double amplitude)
Shock resistance	Destruction	1,000 m/s²
	Malfunction	Excitation: 100 m/s² No excitation: 50 m/s²
Durability	Mechanical	1,000,000 operations min. (at 10,800 operations/h)
	Electrical (Resistive) *4	(1) 480 VAC 100 A 300 operations min. (2) 800 VAC 40 A switch on, 100 A carry current, 40 A switch off; 30,000 operations min. (3) 60 VDC 100 A 400 operations min. (4) 60 VDC 50 A 1,000 operations min. (5) 60 VDC 40 A 6,000 operations min. (Switching frequency: 1 second ON - 9 seconds OFF at 85°C)
Failure rate (P level) (Reference value) *5		1 A at 5 VDC
Use conditions	Coil holding voltage *6	45% to 65% of rated coil voltage
	Ambient operating temperature	-40°C to 85°C (with no icing or condensation)
	Ambient operating humidity	5% to 85%
Weight		Approx. 100 g

Note. The values given above are initial values at 23°C. (Except Electrical Durability)
*1. Measurement conditions: 6 VDC, 20 A (after 5 seconds) voltage drop method.
*2. Measurement conditions: Applied rated coil voltage, no contact bouncing.
*3. Measurement conditions: Measured with a 1,000 VDC megohmmeter at the same point as the dielectric strength was measured.
*4. This specification is when diode and zener diode are used. For relay coil, please connect diode and zener diode.
For more detail, please refer to ●Diode Connection for Operating Coil on page 4.
*5. The value was measured at a switching frequency of 180 operations/ minute.
*6. For the detail regarding holding voltage usage, please refer to ●Coil Voltage Reduction (Holding Voltage) after Relay Operation on page 4.

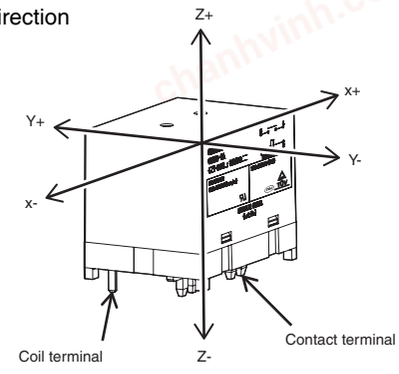
Malfunction shock resistance



Measurement:
Measure the value of contact malfunction happening by applying 3 axes with 6 direction 3 times each.
The energized voltage is within the range of the rated holding voltage.

Standard value:
Excitation 100 m/s²
No excitation 50 m/s²

Shock direction

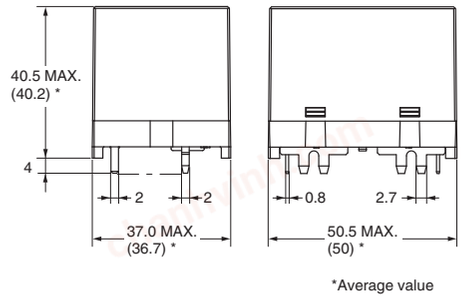


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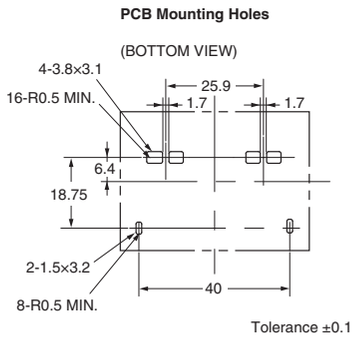
Dimensions

CAD Data Please visit our website, which is noted on the last page. (Unit:mm)

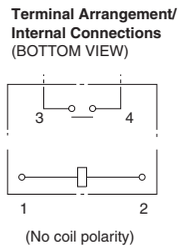
Standard type G7EB-1A



*Average value

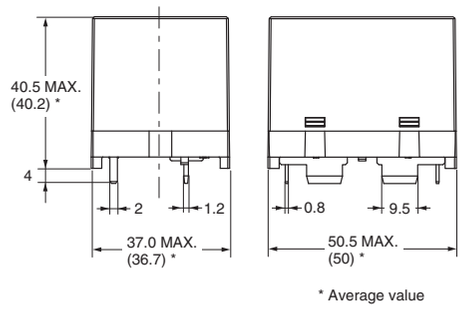


Tolerance ±0.1

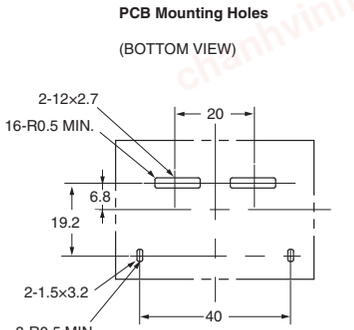


CAD Data

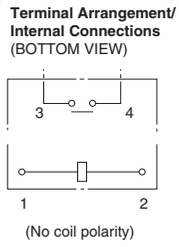
Special terminal type G7EB-1AP1



* Average value



Tolerance ±0.1



CAD Data

Approval Standard

UL Recognized: (File No. E41515)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G7EB-1A G7EB-1AP1	SPST-NO(1a)	12, 24 VDC	800 VAC 55 A (Resistive)	6,000
			800 VAC Making and Breaking 40 A, Carrying 100 A (Resistive)	30,000

EN/IEC, TÜV Certificated: (Certificate No. R50416743)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G7EB-1A G7EB-1AP1	SPST-NO(1a)	12, 24 VDC	800 VAC, 100 A (Resistive)	200

CQC Certificated: (Certificate No. CQC18002207225)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G7EB-1A G7EB-1AP1	SPST-NO(1a)	12, 24 VDC	800 VAC, 100 A (Resistive)	200

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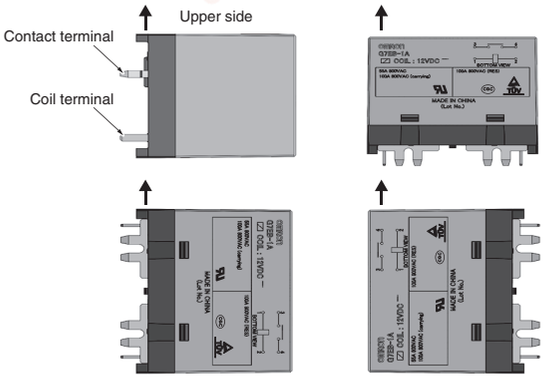
Precautions

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

Correct Use

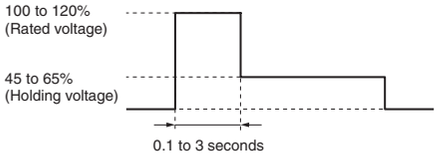
●Mounting Direction

• The relay is limited for mounting direction due to the specification of operation voltage and electrical durability. Do not use in any other direction except as indicated in below chart. There is a risk of reduced operational lifetime for failure to observe this warning.



●Coil Voltage Reduction (Holding Voltage) after Relay Operation

• Use this relay with coil voltage reduction.
• Apply the rated voltage for 0.1 to 3 seconds to the coil first.
• The range of coil rated voltage must be set as 100 to 120%, and holding voltage must be 45 to 65%. Do not exceed the ranges due to the change of coil voltage change and so on.

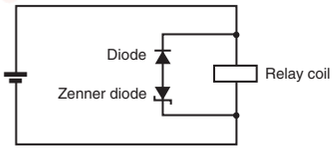


	Applied coil voltage	Coil resistance *	Coil power consumption
Rated voltage	100 to 120%	51 Ω	Approx. 2.8 to 4.0 mW
Holding voltage	45 to 65%		Approx. 0.57 to 1.2 mW

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

●Diode Connection for Operating Coil

• Connect diode or Zener diode (or Varistor) to the coil (refer to the picture below).
Diode is for coil surge absorption. Ensure to include Zener diode as there is a possibility of any influence for switching capability when only using diodes.
• Coil has no polarity. Connect the diodes in the reverse polarity of the voltage applied to the coil.
• The recommended Zener diode voltage is 3 times that of the rated coil voltage.
• Use diodes with reverse dielectric strength 10 times or more that of coil rated voltage, and with forward current more than coil rated current.



●PCB Terminal soldering

• Solder at 290°C for 20 seconds (max.) in soldering bath.
• It is not possible to wash relay as this is not fully sealed type.

●Assembly

• To reduce the risk of specification deterioration, assemble relays in a dust free, low humidity and non-corrosive gas environment.
• Take care when mounting relays to utilize adequate anchorage on both sides of PCB to optimize heat transfer and reduce risk for both heat and mechanical stress.
• This product weight is about 100 g. Be careful of the strength of PCB. To reduce soldering crack due to heat stress, use both sides through hole PCB.

●Drop

• Do not use relays in the event of any droppage.

●Electrical Endurance

• As this relay is high voltage and high current type, there are increased risks of abnormal heat generation or fire if you use in a application inconsistent with published specification. Use only within specified rating.
• This relay's electrical endurance specification is based on our company's standard test procedure with resistive loads. Relays intended for use with remove; types of drive circuits PWM, capacitive, resistive dropper etc.), types of loads (e.g. capacitive or inductive), and switching cycles (duty and operation timing) must be tested to confirm suitability to the actual intended application.
• When using with a DC load, the final failure mode is failure to break the circuit. In a worst-case scenario, burning may extend to surrounding components. Implement safety circuits and other measures to minimize the risk in case of the unlikely event of a failure.

●Micro load

• This is a power relay for high power switching. Do not use for micro loads such as signal switching.

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