G7EB
PCB Power Relays

High Power Relay with Max. Switching Voltage of 800 VAC, Carry Current of 100 A (Standard Model)/ 120 A or 150 A (High-Capacity Model)



- High power switching of 480 VAC 100 A (standard/high-capacity 120 A model), 800 VAC 150 A (high-capacity 150 A model)
- Bidirectional DC power switching of 60 VDC 100 A (standard/high-capacity 120 A model), 60 VDC 150 A (high-capacity 150 A model)
- Ambient temperature 85°C (Up to 105°C under specific conditions)
- High impulse withstand voltage, 10 kV
- Contact gap ≥3.6 mm (Applied to VDE0126)
- Low initial contact resistance ≤5 mΩ

⚠ **Refer to the Precautions on page 6.**

Model Number Legend

G7EB-□□□-□
1 2 3 4

1. Number of Poles
   1: 1-pole
2. Contact Form
   A: SPST-NO (1a)
3. Terminal Shape
   None: Standard model
   P1: Special terminal model
4. Special Functions
   None: Standard model
   E: High-capacity 120 A model
   E2: High-capacity 150 A model

Application Examples

- Grid-interactive Inverter for Solar & Energy Storage
- Industrial Inverter
- Uninterruptible power supply (UPS)
- EV Charging Station

Ordering Information

Classification		Contact form	Enclosure rating	Model	Rated coil voltage (V)	Minimum packing unit
Standard	Standard	SPST-NO (1a)	Flux protection	G7EB-1A	12 VDC 24 VDC	60pcs/box
	Special terminal			G7EB-1AP1		
High-capacity 120 A	Standard			G7EB-1A-E		
	Special terminal			G7EB-1AP1-E		
High-capacity 150 A				G7EB-1A-E2		

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.

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Ratings/Characteristics

Ratings

●Coil

Classification	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			
Standard, High-capacity 120 A	12 VDC	Approx. 235.3	51	75% max. (Note 5.)	5 to 32%	135% (at 23°C)	Approx. 2,800 Approx. 575 (Note 4.)
	24 VDC	Approx. 116.5	206				
High-capacity 150 A	12 VDC	Approx. 291.7	41			110% (at 23°C)	Approx. 3,500 Approx. 709 (Note 4.)
	24 VDC	Approx. 145.8	165				

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. For details, please refer to ●Coil Voltage Reduction (Holding Voltage) during and after Relay Operation on page 6.
Note 5. Do not use in any direction other than the specified direction. For details, please refer to ●Mounting Direction on page 6. For contact terminals mounted in the downward direction, the operating voltage will be at most 80% of the rated voltage. (Contact terminals downward direction: The direction in which the marked surface faces the ground)

●Contacts

Item	Standard	High-capacity 120 A	High-capacity 150 A
Contact type	Double break		
Contact material	Ag Alloy (Cd free)		
Rated load (resistive 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		150 A at 480 VAC, 150 A at 800 VAC, 800 VAC making: 40 A, carrying: 150 A, breaking: 40 A, 150 A at 60 VDC, 40 A at 60 VDC
Rated carry current	100 A (85°C), 60 A (105°C)	120 A (85°C), 80 A (105°C)	150 A
Max. switching voltage	800 VAC, 60 VDC		
Max. switching current	100 A		150 A

Characteristics

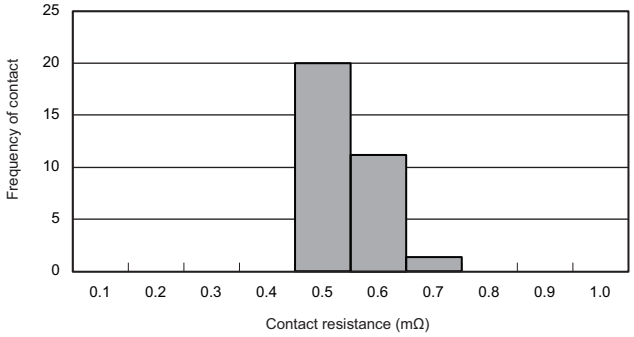
Item		Standard	High-capacity 120 A	High-capacity 150 A
Contact resistance *1		5 mΩ max.		
Operate time *2		30 ms max.		
Release time *2		10 ms max.		
Insulation resistance *3		1,000 MΩ min.		
Dielectric strength	Between coil and contacts	5,000 VAC, 50/60 Hz for 1 min		
	Between contacts of the same polarity	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, 0.15 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 at 85°C 300 operations (2) 800 VAC making 40 A, carrying 100 A, breaking 40 A at 85°C; 30,000 operations (3) 60 VDC 100 A at 85°C 400 operations (4) 60 VDC 50 A at 85°C 1,000 operations (5) 60 VDC 40 A at 85°C 6,000 operations (6) 800 VAC making 40 A, carrying 60 A, breaking 40 A at 105°C; 8,000 operations (Switching frequency: 1 second ON - 9 seconds OFF)	(1) 480 VAC 100 A at 85°C 300 operations (2) 60 VDC 100 A at 85°C 400 operations (3) 60 VDC 50 A at 85°C 1,000 operations (4) 60 VDC 40 A at 85°C 6,000 operations (5) 800 VAC making 40 A, carrying 120 A, breaking 40 A at 85°C; 30,000 operations (6) 800 VAC making 40 A, carrying 80 A, breaking 40 A at 105°C; 8,000 operations (Switching frequency: 1 second ON - 9 seconds OFF)	(1) 480 VAC 150 A at 85°C 100 operations (2) 800 VAC 150 A at 85°C 30 operations (3) 800 VAC making 40 A, carrying 150 A, breaking 40 A at 85°C; 30,000 operations (4) 60 VDC 150 A at 85°C 400 operations (5) 60 VDC 40 A at 85°C 6,000 operations (Switching frequency: 1 second ON - 9 seconds OFF)
Failure rate (P level) (Reference value) *5		1 A at 5 VDC		
Use conditions	Coil holding voltage *6	45% to 65% of the rated coil voltage (85°C), 50% to 55% of the rated coil voltage (105°C)		45% to 65% of rated coil voltage
	Ambient operating temperature	-40°C to 105°C (with no icing or condensation)		-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 6.
*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) during and after Relay Operation on page 6.

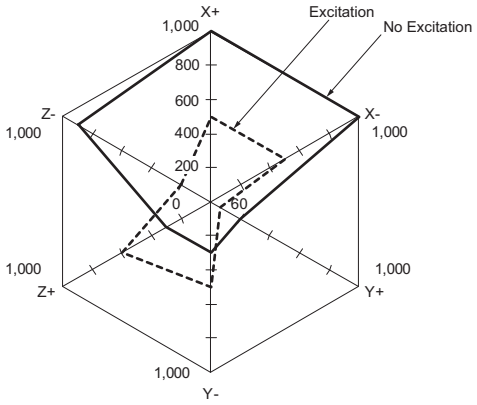
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Engineering Data

Contact resistance



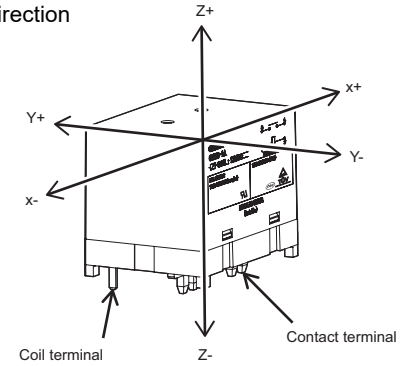
Malfunction shock resistance



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/s^2
No excitation 50 m/s^2

Shock direction



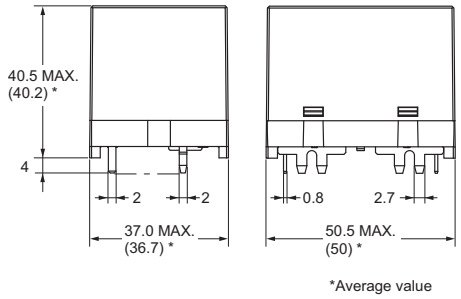
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Dimensions

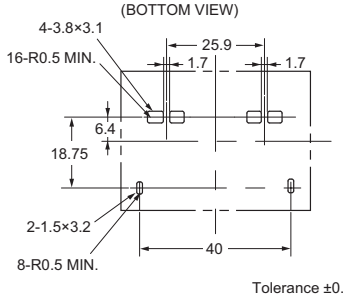
CAD Data marked products, 2D drawings and 3D CAD models are available.
For CAD information, please visit our website, which is noted on the last page.

(Unit:mm)

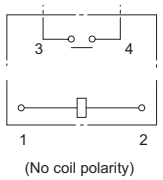
G7EB-1A, G7EB-1A-E



PCB Mounting Holes
(BOTTOM VIEW)



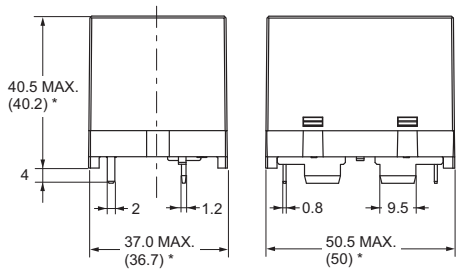
Terminal Arrangement/ Internal Connections
(BOTTOM VIEW)



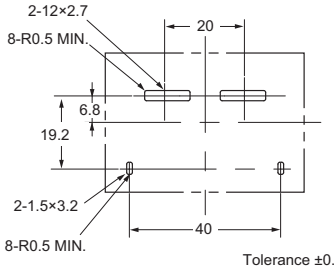
(No coil polarity)

CAD Data

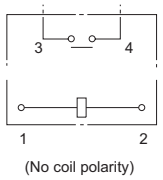
G7EB-1AP1, G7EB-1AP1-E



PCB Mounting Holes
(BOTTOM VIEW)



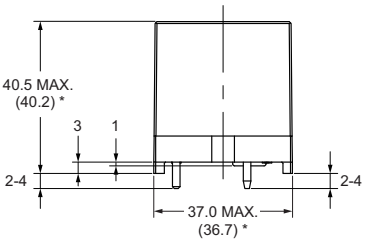
Terminal Arrangement/ Internal Connections
(BOTTOM VIEW)

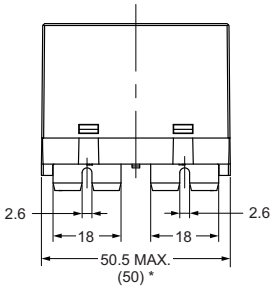


(No coil polarity)

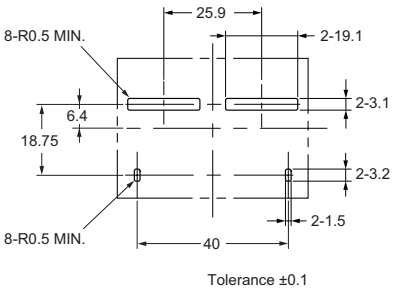
CAD Data

G7EB-1A-E2

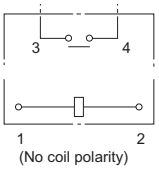




PCB Mounting Holes
(BOTTOM VIEW)



Terminal Arrangement/ Internal Connections
(BOTTOM VIEW)



(No coil polarity)

CAD Data

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Approval Standard

UL/C-UL Certificated: (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) 85°C	6,000
			800 VAC making 40 A, carrying 100 A, breaking 40 A 85°C	30,000
			60 VDC 40 A (Resistive) 85°C	6,000
			60 VDC 100 A (Resistive) 85°C	400
G7EB-1A-E G7EB-1AP1-E	SPST-NO(1a)	12, 24 VDC	800 VAC 55 A (Resistive) 85°C	6,000
			800 VAC making 40 A, carrying 120 A, breaking 40 A 85°C	30,000
			60 VDC 40 A (Resistive) 85°C	6,000
			60 VDC 100 A (Resistive) 85°C	400
G7EB-1A-E2	SPST-NO(1a)	12, 24 VDC	480 VAC 150A (Resistive) 85°C	100
			800 VAC 150A (Resistive) 85°C	30
			800 VAC making 40 A, carrying 150 A, breaking 40 A 85°C	30,000
			60 VDC 150A (Resistive) 85°C	400
			60 VDC 40A (Resistive) 85°C	6,000

EN/IEC, TÜV Certificated: (Certificate No.R 50416743)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G7EB-1A G7EB-1AP1 G7EB-1A-E G7EB-1AP1-E	SPST-NO(1a)	12, 24 VDC	800 VAC, 100 A (Resistive) 85°C	200
			60 VDC 40 A (Resistive) 85°C	6,000
			60 VDC 50 A (Resistive) 85°C	1,000
			60 VDC 100 A (Resistive) 85°C	400
G7EB-1A-E G7EB-1AP1-E	SPST-NO(1a)	12, 24 VDC	800 VAC making 40 A, carrying 120 A, breaking 40 A 85°C	30,000
G7EB-1A-E2	SPST-NO(1a)	12, 24 VDC	480 VAC 150A (Resistive) 85°C	100
			800 VAC 150A (Resistive) 85°C	30
			800 VAC making 40 A, carrying 150 A, breaking 40 A 85°C	30,000
			60 VDC 150A (Resistive) 85°C	400
			60 VDC 40A (Resistive) 85°C	6,000

CQC Certificated: (Certificate No.CQC18002207225)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G7EB-1A G7EB-1AP1 G7EB-1A-E G7EB-1AP1-E	SPST-NO(1a)	12, 24 VDC	800 VAC, 100 A (Resistive) 85°C	200
			60 VDC 100 A (Resistive) 85°C	400
G7EB-1A-E G7EB-1AP1-E	SPST-NO(1a)	12, 24 VDC	800 VAC making 40 A, carrying 120 A, breaking 40 A 85°C	30,000
G7EB-1A-E2	SPST-NO(1a)	12, 24 VDC	480 VAC 150A (Resistive) 85°C	100
			800 VAC 150A (Resistive) 85°C	30
			800 VAC making 40 A, carrying 150 A, breaking 40 A 85°C	30,000
			60 VDC 150A (Resistive) 85°C	400
			60 VDC 40A (Resistive) 85°C	6,000

Creepage distance (required value)		12.5 mm min. (IEC/UL)
Clearance (required value)		8 mm min. (IEC/UL)
Insulation material group		IIIa
Type of insulation	coil-contact circuit	Basic (800 V, OV-cat, III, up to 2,000 m above sea level) Basic (800 V, OV-cat, II, up to 4,000 m above sea level)
Type of interruption		Micro disconnection
Rated insulation voltage		800 V
Pollution degree		3
Rated voltage system		800 V
Category of protection (IEC61810-1)		RT II
Flammability class (UL94)		V-0
Coil insulation system (UL1446)		Class F

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Precautions

●Please refer to www.fa.omron.co.jp/ for the "PCB Relays Common Precautions".

⚠Warning

As this relay is a high-voltage and high-current type, there is a risk of abnormal heat generation, smoke generation or fire if you use the relay with a contact voltage, current, or for a number of times beyond the specified range. Use only within the specified ranges.

If the power is switched on when the connections are insufficient, there is a risk of abnormal heat generation. Do not connect and use clips and sockets on individual relays.

If the power is switched on when the connections are insufficient, there is a risk of abnormal heat generation. Please install and use relays under recommended conditions.

Precautions for Safe Use

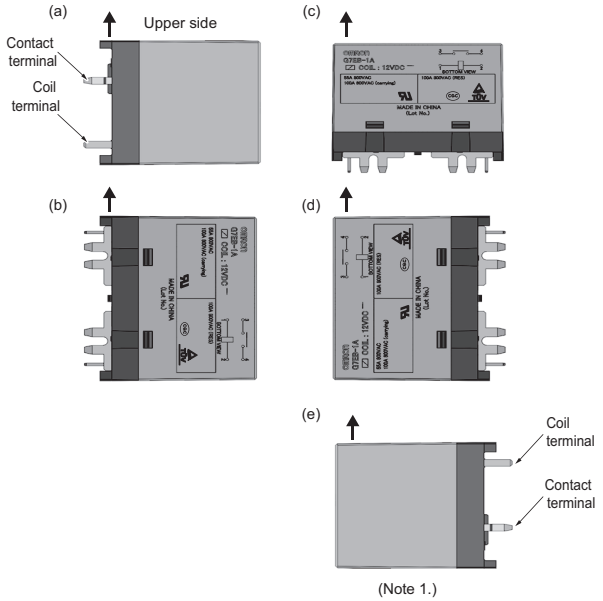
●Drop

- Do not use relays that have been dropped as they may not function properly.

Precautions for 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.

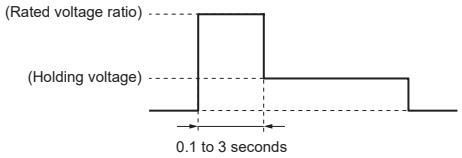


(Note 1.)

Note 1. The operating voltage differs from the applied coil voltage for contact terminals mounted in the downward direction (e). Please refer to ●Coil on page 2 and ●Coil Voltage Reduction (Holding Voltage) during and after Relay Operation.

●Coil Voltage Reduction (Holding Voltage) during and after Relay Operation

- Use this relay with coil voltage reduction.
- Use the relay in the applied voltage and time ranges indicated in the figure and table below. Do not exceed this range due to coil voltage change and so on.



G7EB-1A/G7EB-1AP1/G7EB-1A-E/G7EB-1AP1-E

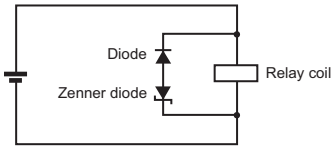
Ambient temperature 85°C max.	Mounting Direction (a) to (d)	Mounting Direction (e)
Rated voltage ratio	100 to 120%	125 to 135%
Holding voltage	45 to 65%	
Ambient temperature 85 to 105°C	Mounting Direction (a) to (d)	Mounting Direction (e)
Rated voltage ratio	130 to 135%	155 to 160%
Holding voltage	50 to 55%	

G7EB-1A-E2

Ambient temperature 85°C max.	Mounting Direction (a) to (d)	Mounting Direction (e)
Rated voltage ratio	100 to 110%	125 to 135%
Holding voltage	45 to 65%	

●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.

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●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.
- The 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.

●Electrical Endurance

- 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.
- The final failure mode is failure to break the circuit. In such a case, burning may extend to surrounding components. Implement safety circuits and other measures to minimize the risk of mechanical 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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