

COMPACT POWER TWIN RELAY

1 POLE x 2—30A (Dual relay)

(FOR AUTOMOTIVE APPLICATIONS)

FBR512, 522 SERIES

■ FEATURES

- Two independent relays mounted in a single package
- Miniature size
(54% of the volume of the FBR160 relays)
- High current contact capacity
(carrying current: 35 A/10 minutes, 25 A/1 hour)
- High resistance to vibration and shock
- Improved heat resistance and extended operating range
- Two contact gap options
(FBR510: 0.3 mm, FBR520: 0.6 mm)
- Two types of contact materials



■ ORDERING INFORMATION

FBR512 N D12 - W1 **

[Example] —(a)— (b) -(c)- (d) -(e)-

| | | |
|-----|--------------------|---|
| (a) | Series Name | FBR512: Standard type (contact gap 0.3 mm) FBR522: Wider contact gap type (contact gap 0.6 mm) |
| (b) | Enclosure | N : Plastic sealed type |
| (c) | Nominal Voltage | D06 : 6 VDC D09 : 9 VDC D10 : 10 VDC D12 : 12 VDC |
| (d) | Contact Material | W1 : Silver-tin oxide indium (high power type) |
| (e) | Custom Designation | To be assigned custom specification |

FBR512, 522 SERIES

■ SPECIFICATIONS

| Item | | Specifications | |
|------------|------------------------------------|--|--|
| | | W1 contact | |
| Contact | Arrangement | 1 form C × 2 (SPDT × 2) | |
| | Material | Silver-tin oxide indium (high power type) | |
| | Voltage Drop (Resistance) | Maximum 100 mV (at 1 A 12 VDC) | |
| | Rating | 14 VDC 25 A (locked motor load) | |
| | Maximum Carrying Current*1 | 35 A/10 minutes, 30 A/1 hour (25°C, 100% rated coil voltage) | |
| | Max. Inrush Current (Reference) | 60 A | |
| | Max. Switching Current (Reference) | 35 A 16 VDC | |
| | Min. Switching Load*2 (Reference) | 1 A 6 VDC | |
| Coil | Operating Temperature | -40°C to + 85°C (no frost) | |
| | Storage Temperature | -40°C to +100°C (no frost) | |
| Time Value | Operate (at nominal voltage) | Maximum 10 ms | |
| | Release (at nominal voltage) | Maximum 5 ms | |
| Life | Mechanical | 1 × 10 ⁷ operations minimum | |
| | Electrical | 2 × 10 ⁵ operations minimum 14 VDC 25 A (locked motor load) | |
| Other | Vibration Resistance | | 10 to 55 Hz (double amplitude of 1.5 mm) |
| | Shock Resistance | Misoperation | 100 m/s ² |
| | | Endurance | 1,000 m/s ² |
| | Weight | | Approximately 13 g |

*1 Need to consider the head from PCB when max. current is more than 10A.

*2 Values when switching a resistive load at normal room temperature and humidity, and in a clean environment. The minimum switching load varies with the switching frequency and operating environment.

■ COIL DATA CHART

1. FBR512 SERIES

| MODEL | Nominal voltage | Coil resistance (±10%) (at 20°C) | Must operate voltage* | Thermal resistance |
|---------------|-----------------|----------------------------------|--|--------------------|
| W1 contact | | | | |
| FBR512ND06-W1 | 6 VDC | 60 Ω | 3.6 VDC (at 20°C) 4.5 VDC (at 85°C) | 73°C/W |
| FBR512ND09-W1 | 9 VDC | 135 Ω | 5.4 VDC (at 20°C) 6.8 VDC (at 85°C) | |
| FBR512ND10-W1 | 10 VDC | 180 Ω | 6.3 VDC (at 20°C) 7.9 VDC (at 85°C) | |
| FBR512ND12-W1 | 12 VDC | 240 Ω | 7.3 VDC (at 20°C) 9.2 VDC (at 85°C) | |

* Pulse drive

FBR512, 522 SERIES

2. FBR522 SERIES

| MODEL | Nominal voltage | Coil resistance ($\pm 10\%$) (at 20°C) | Must operate voltage* | Thermal resistance |
|---------------|-----------------|--|--|--------------------|
| W1 contact | | | | |
| FBR522ND06-W1 | 6 VDC | 45 Ω | 3.6 VDC (at 20°C) 4.5 VDC (at 85°C) | 65°C/W |
| FBR522ND09-W1 | 9 VDC | 100 Ω | 5.4 VDC (at 20°C) 6.8 VDC (at 85°C) | |
| FBR522ND10-W1 | 10 VDC | 135 Ω | 6.3 VDC (at 20°C) 7.9 VDC (at 85°C) | |
| FBR522ND12-W1 | 12 VDC | 180 Ω | 7.3 VDC (at 20°C) 9.2 VDC (at 85°C) | |

* Pulse drive

■ SUITABLE APPLICATIONS

| Application | Normal load current (12 VDC system) | Description | Recommended model (example) | |
|--------------------------------------|---|-----------------------------------|-------------------------------------|---|
| | | | For 16 V or less motor load voltage | For instantaneous 20 V or more load voltage |
| Power Windows | 20 to 25 A (switching at motor locking) | forward and reverse motor control | FBR512N□ -W1 | FBR522N□ -W1 |
| Automatic Door Lock | 18 to 25 A (switching at motor locking) | forward and reverse motor control | FBR512N□ -W1 | FBR522N□ -W1 |
| Automatic Antenna | 8 to 12 A (INRUSH) break 2 A maximum (motor-free) | forward and reverse motor control | FBR512N□ -W1 | |
| Intermittent Wipers (Front and Rear) | 15 to 30 A break 2 to 8 A (motor-free) | forward only | FBR512N□ -W1 | FBR522N□ -W1 |
| Tilt-Lock Wheel | 20 A (switching at motor locking) | forward and reverse motor control | FBR512N□ -W1 | FBR522N□ -W1 |
| Power Seat | 20 to 30 A (switching at motor locking) | forward and reverse motor control | FBR512N□ -W1 | FBR522N□ -W1 |
| Sunroof | 20 to 30 A (switching at motor locking) | forward and reverse motor control | FBR512N□ -W1 | FBR522N□ -W1 |

• For the load condition where higher voltage would be encountered during contact break, FBR522 series with wider contact gap is recommended.

FBR512, 522 SERIES

CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



2. LIFE



3. LIFE TEST (EXAMPLE)

- Test item
14 V DC-20 A
Motor lock
200,000 operations minimum
(FBR512 □-W type)

- Test circuit



- Shift of pick-up and drop-out voltage



- Current wave form

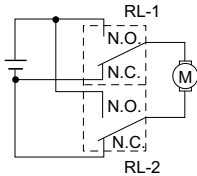


- Shift of contact resistance



FBR512, 522 SERIES

- Test item
14 V DC-25 A
Motor lock
200,000 operations minimum
(FBR512 □-W1 type)
- Test circuit



- Shift of pick-up and drop-out voltage



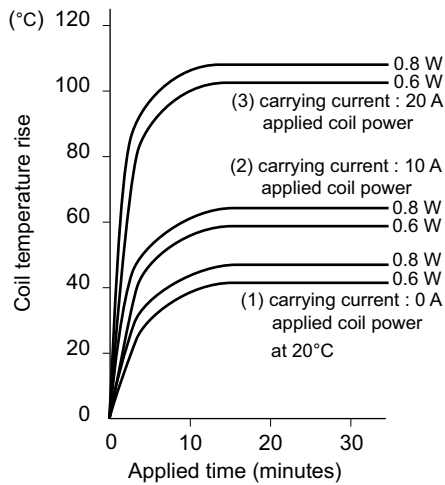
- Current wave form



- Shift of contact resistance



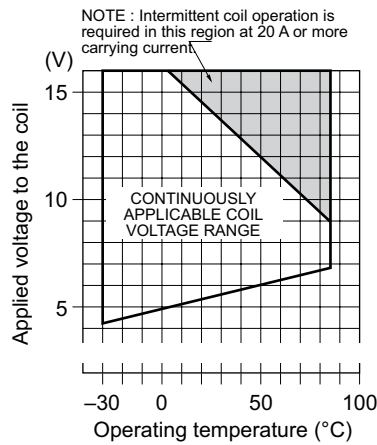
4. COIL TEMPERATURE RISE



5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

[FBR512ND09-W]

[FBR512ND12-W]

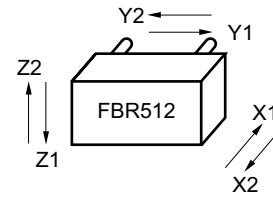
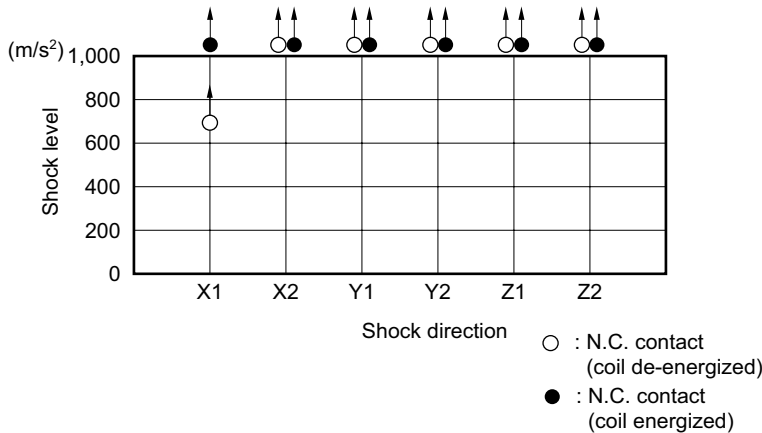


FBR512, 522 SERIES

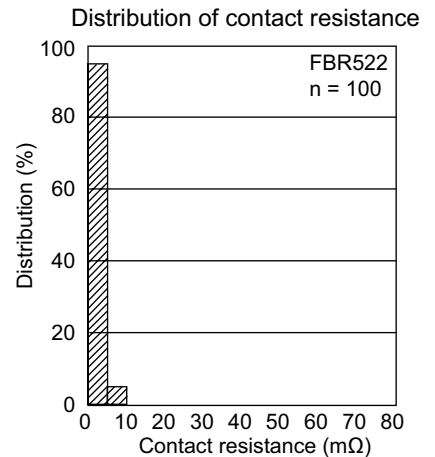
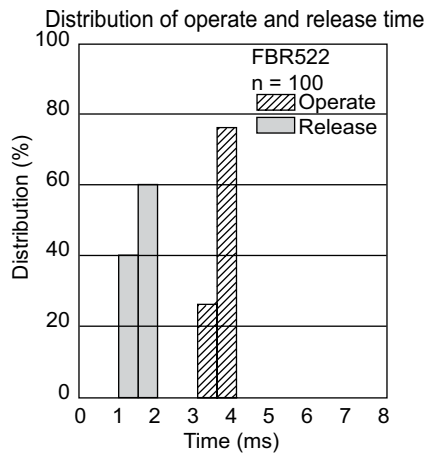
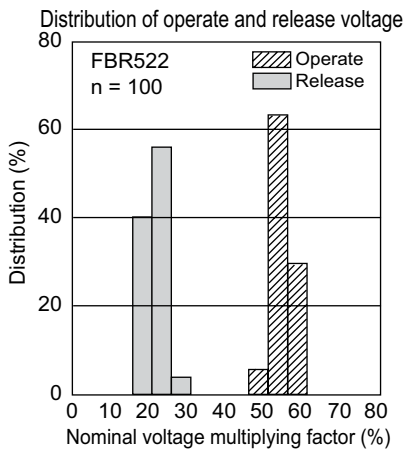
6. VIBRATION RESISTANCE CHARACTERISTICS



7. SHOCK RESISTANCE CHARACTERISTICS



REFERENCE DATA



FBR512, 522 SERIES

■ DIMENSIONS

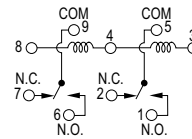
● Dimensions



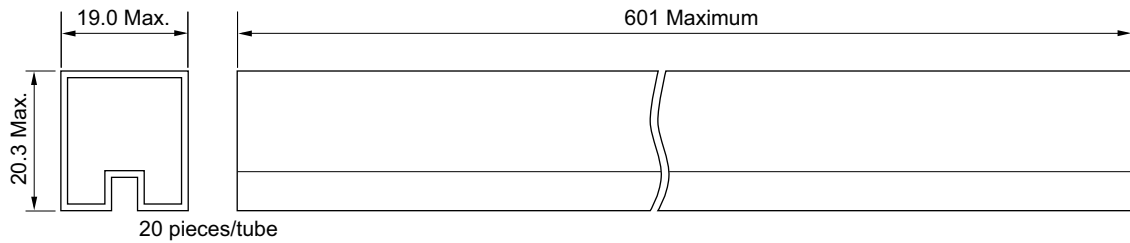
● PC board mounting hole layout (BOTTOM VIEW)



● Schematic (BOTTOM VIEW)



● Tube carrier



Unit: mm

Fujitsu Components International Headquarter Offices

Japan

Fujitsu Component Limited
 Gotanda-Chuo Building
 3-5, Higashigotanda 2-chome, Shinagawa-ku
 Tokyo 141 8630, Japan
 Tel: (81-3) 5449-7010
 Fax: (81-3) 5449-2626
 Email: promothq@fcl.fujitsu.com
 Web: www.fcl.fujitsu.com

North and South America

Fujitsu Components America, Inc.
 250 E. Caribbean Drive
 Sunnyvale, CA 94089 U.S.A.
 Tel: (1-408) 745-4900
 Fax: (1-408) 745-4970
 Email: components@us.fujitsu.com
 Web: <http://www.fujitsu.com/us/services/edevices/components/>

Europe

Fujitsu Components Europe B.V.
 Diamantlaan 25
 2132 WV Hoofddorp
 Netherlands
 Tel: (31-23) 5560910
 Fax: (31-23) 5560950
 Email: info@fceu.fujitsu.com
 Web: emea.fujitsu.com/components/

Asia Pacific

Fujitsu Components Asia Ltd.
 102E Pasir Panjang Road
 #01-01 Citilink Warehouse Complex
 Singapore 118529
 Tel: (65) 6375-8560
 Fax: (65) 6273-3021
 Email: fcalfcal.fujitsu.com
 Web: <http://www.fujitsu.com/sg/services/micro/components/>

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