

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

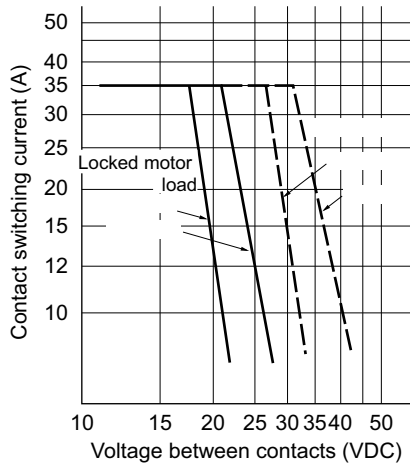
| Application | Normal load current (12 VDC system) | Description | Recommended model (example) | |
|--------------------------------------|---|-----------------------------------|-------------------------------------|---|
| | | | For 16 V or less motor load voltage | For instantaneous 20 V or more load 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



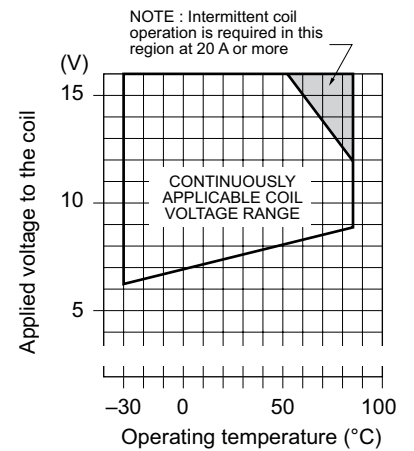
4. COIL TEMPERATURE RISE



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

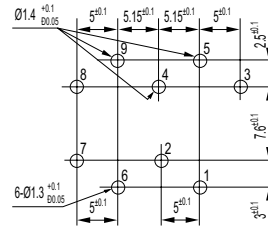
DIMENSIONS

Dimensions

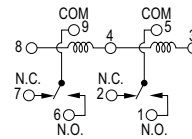


*N.C. TERMINAL

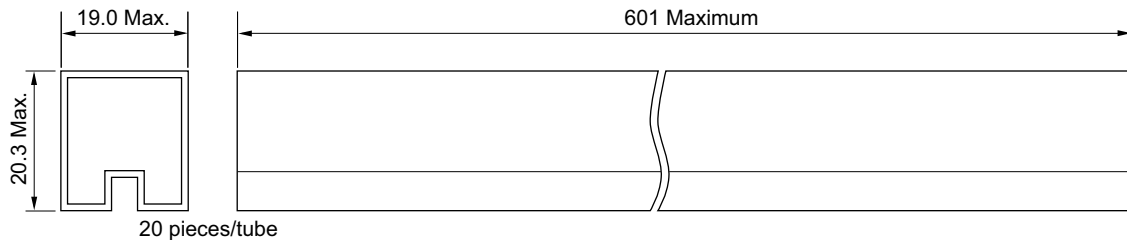
PC board mounting hole layout (BOTTOM VIEW)



Schematic (BOTTOM VIEW)



Tube carrier



Unit: mm

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