

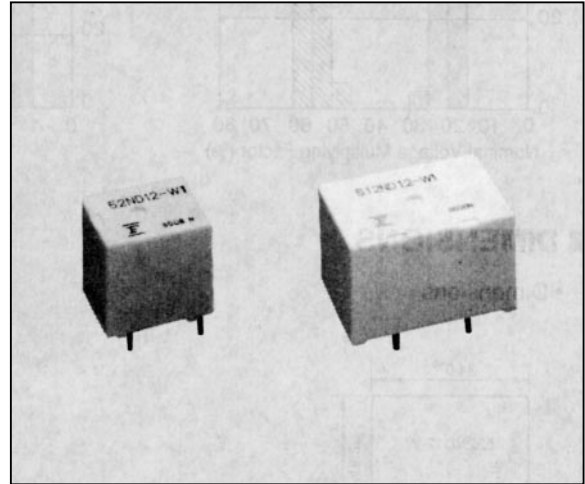
# COMPACT HIGH POWER RELAY

## 1 POLE/1 POLE × 2-25 A (FOR AUTOMOTIVE APPLICATIONS)

### FBR50, 510 (W1) SERIES

#### ■ FEATURES

- Suitable for automotive application of High-power motor load controls, door lock, power windows.
- Enhanced contact switching capacity based on FBR50, 510 series.  
(switching current 20 A → 25 A)  
Possible to switch 14 VDC–25 A, locked rotor for more than 200,000 operations.



#### ■ ORDERING INFORMATION

[Example]  $\frac{\text{FBR51}}{\text{(a)}} \frac{\text{N}}{\text{(b)}} \frac{\text{D12}}{\text{(c)}} - \frac{\text{W1}}{\text{(d)}} \frac{\text{**}}{\text{(e)}}$

|     |                    |  |
|-----|--------------------|--|
| (a) | Series Name        | FBR51 : Standard Type (Contact Gap 0.3 mm)<br>FBR512: Standard Twin Type (Contact Gap 0.3 mm)<br>FBR52 : Wider Contact Gap Type (Contact Gap 0.6 mm)<br>FBR522: Wider Contact Gap Twin Type (Contact Gap 0.6 mm) |
| (b) | Enclosure          | N : Plastic Sealed Type  |
| (c) | Nominal Voltage    | D06 : 6 VDC<br>D09 : 9 VDC<br>D10 : 10 VDC<br>D12 : 12 VDC   |
| (d) | Contact Material   | W1 : Silver-Tin oxide indium   |
| (e) | Custom Designation | To be assigned custom specification  |

# FBR50, 510 (W1) SERIES

## ■ SPECIFICATIONS

| Item       |   | FBR50 Series  | FBR510 Series                                 |
|------------|---|---|---|
| Contact    | Arrangement                                   | 1 Form C  | 1 Form C × 2                                  |
|            | Material                                      | Silver-Tin oxide indium                                   |   |
|            | Voltage Drop (Resistance)                     | Max. 100 mV (at 2 A 12 VDC)                               |   |
|            | Ratings                                       | 14 VDC 25 A (Locked Motor Load)                           |   |
|            | Max. Carrying Current                         | 35 A/ 10 min.<br>25 A/ 1 Hr. (25°C, Nominal Voltage)      |   |
|            | Max. Inrush Current (Reference)               | 60 A  |   |
|            | Max. Switching Current (Reference)            | 35 A 16 VDC   |   |
|            | Min. Switching Load* <sup>1</sup> (Reference) | 6 VDC, 1 A  |   |
| Coil       | Operating Temperature                         | -30°C~+85°C (No frost) (Refer to the CHARACTERISTIC DATA) |   |
|            | Storage Temperature                           | -40°C~+100°C (No frost)                                   |   |
| Time Value | Operate (at nominal voltage)                  | Max. 10 ms  |   |
|            | Release (at nominal voltage)                  | Max. 5 ms   |   |
| Life       | Mechanical                                    | 10 × 10 <sup>6</sup> ops. min.                            |   |
|            | Electrical                                    | 200 × 10 <sup>3</sup> ops. min. (Locked Motor Load)       |   |
| Other      | Vibration Resistance                          | 10 to 55 Hz (double amplitude of 1.5 mm)                  |   |
|            | Shock Resistance                              | Misoperation  | 100 m/s <sup>2</sup> (11 ± <sup>1</sup> ms)   |
|            |   | Endurance   | 1,000 m/s <sup>2</sup> (11 ± <sup>1</sup> ms) |
|            | Unit Mass                                     | Approx. 6 g   | Approx. 13 g                                  |

\*1 Values when switching a resistive load at normal room temperature and humidity and in a clean atmosphere.  
The minimum switching load varies with the switching frequency and operating environment.

# FBR50, 510 (W1) SERIES

## COIL DATA CHART

### 1. FBR51, FBR510 Series

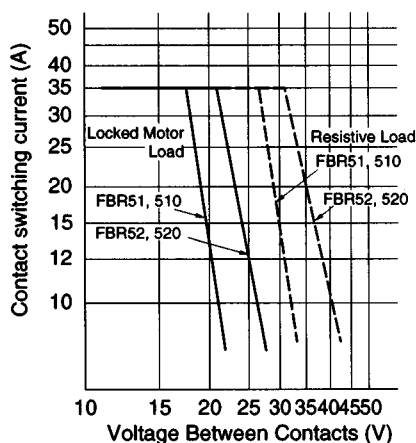
| MODEL        |               | Nominal Voltage | Coil resistance<br>(±10%) (at 20°C) | Must Operate Voltage                   | Thermal Resistance |
|--------------|---------------|-----------------|-------------------------------------|--|--------------------|
| FBR51 Series | FBR510 Series |                 |                                     |  |                    |
| FBR51ND06-W1 | FBR512ND06-W1 | 6 VDC           | 60 Ω                                | 3.6 VDC (at 20°C)<br>4.5 VDC (at 85°C) | 73°C/W             |
| FBR51ND09-W1 | FBR512ND09-W1 | 9 VDC           | 135 Ω                               | 5.4 VDC (at 20°C)<br>6.8 VDC (at 85°C) |                    |
| FBR51ND10-W1 | FBR512ND10-W1 | 10 VDC          | 180 Ω                               | 6.3 VDC (at 20°C)<br>7.9 VDC (at 85°C) |                    |
| FBR51ND12-W1 | FBR512ND12-W1 | 12 VDC          | 240 Ω                               | 7.3 VDC (at 20°C)<br>9.0 VDC (at 85°C) |                    |

### 2. FBR52, FBR520 Series

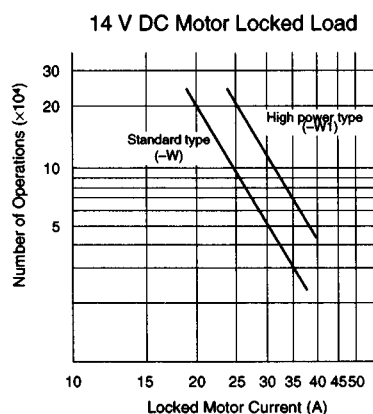
| MODEL        |               | Nominal Voltage | Coil resistance<br>(±10%) (at 20°C) | Must Operate Voltage                   | Thermal Resistance |
|--------------|---------------|-----------------|-------------------------------------|--|--------------------|
| FBR52 Series | FBR520 Series |                 |                                     |  |                    |
| FBR52ND06-W1 | FBR522ND06-W1 | 6 VDC           | 45 Ω                                | 3.6 VDC (at 20°C)<br>4.5 VDC (at 85°C) | 65°C/W             |
| FBR52ND09-W1 | FBR522ND09-W1 | 9 VDC           | 100 Ω                               | 5.4 VDC (at 20°C)<br>6.8 VDC (at 85°C) |                    |
| FBR52ND10-W1 | FBR522ND10-W1 | 10 VDC          | 135 Ω                               | 6.3 VDC (at 20°C)<br>7.9 VDC (at 85°C) |                    |
| FBR52ND12-W1 | FBR522ND12-W1 | 12 VDC          | 180 Ω                               | 7.3 VDC (at 20°C)<br>9.0 VDC (at 85°C) |                    |

## CHARACTERISTIC DATA

### 1. MAXIMUM BREAK CAPACITY



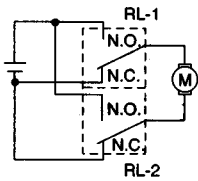
### 2. LIFE



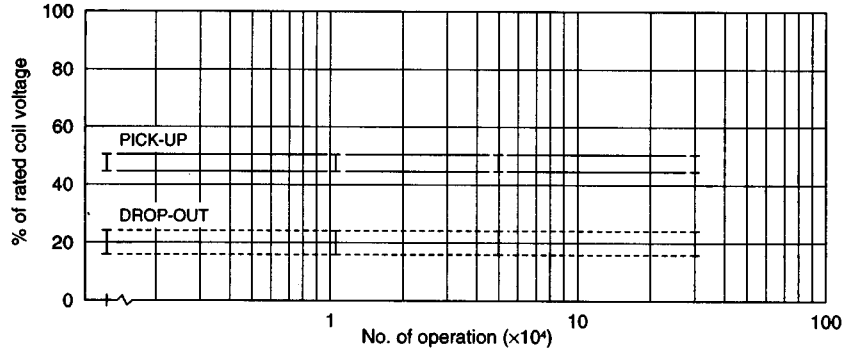
# FBR50, 510 (W1) SERIES

## 3. LIFE TEST (EXAMPLE)

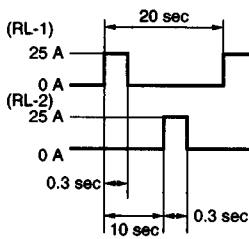
- Test Item  
14 V DC-25 A  
Motor Lock  
200,000 ops.min  
(EBR512□ -W1 type)
- Test Circuit



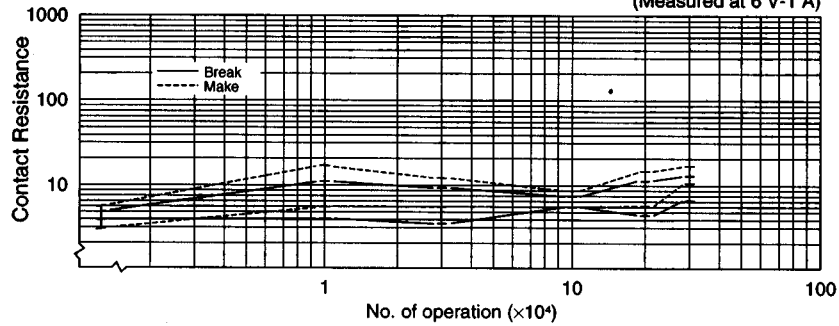
- Shift of Pick-up and Drop-out Voltage



- Current Wave Form

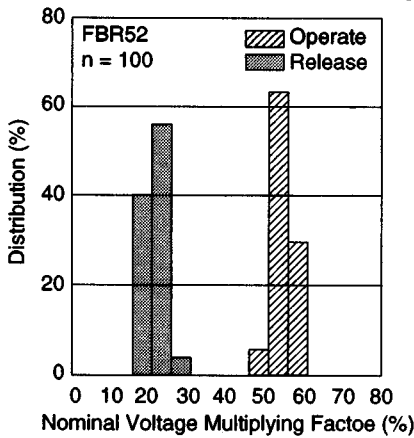


- Shift of Contact Resistance

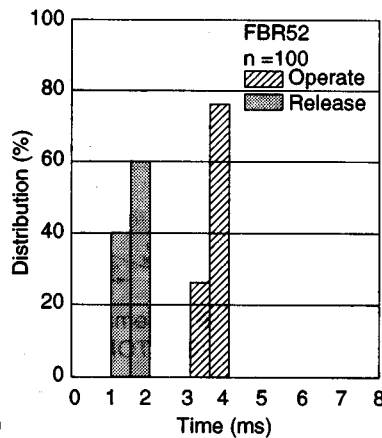


## ■ REFERENCE DATA

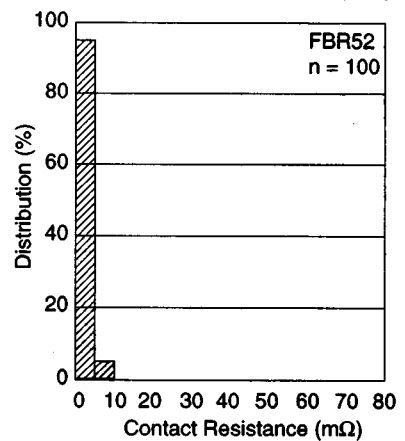
Distribution of operate & Release Voltage



Distribution of operate & Release Time



Distribution of Contact Resistance

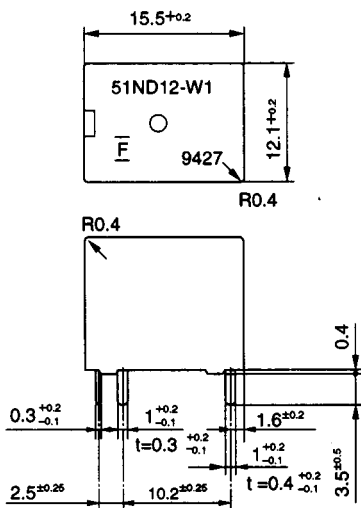


# FBR50, 510 (W1) SERIES

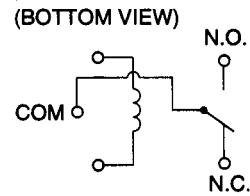
## ■ DIMENSIONS

### • FBR51, 52 type

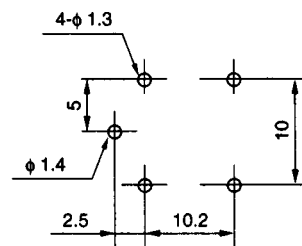
#### ● Dimensions



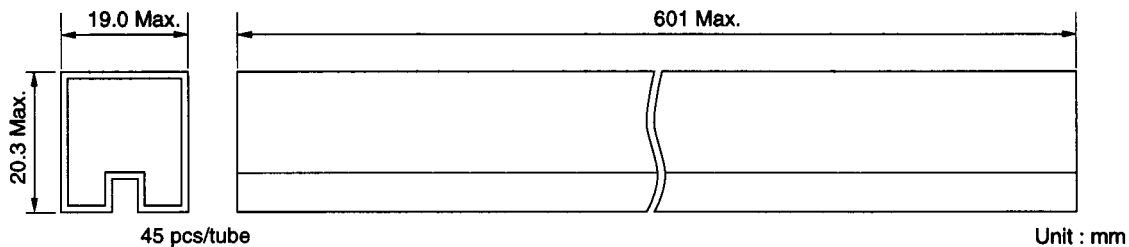
#### ● Schematics



#### ● PC board mounting hole layout (BOTTOM VIEW)

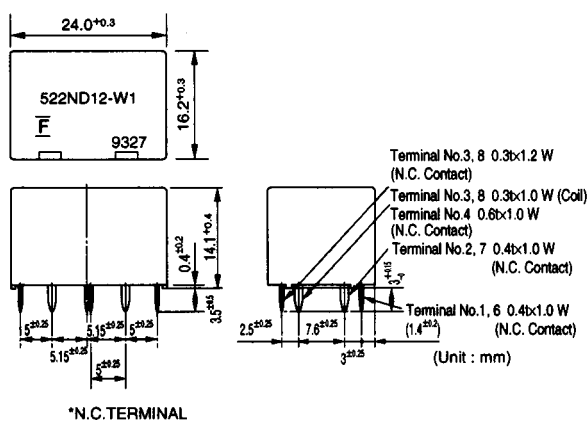


#### ● Tube carrier



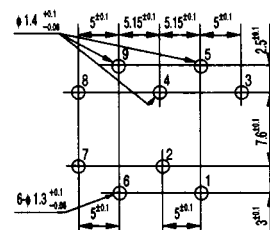
### • FBR510, 520 type

#### ● Dimensions

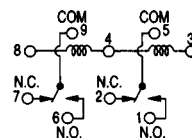


\*N.C.TERMINAL

#### ● PC board mounting hole layout (BOTTOM VIEW)



#### ● Schematics (BOTTOM VIEW)



#### ● Tube carrier

