

# 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 <sup>7</sup> operations minimum	
	Electrical	2 × 10 <sup>5</sup> 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 <sup>2</sup>
		Endurance	1,000 m/s <sup>2</sup>
	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 $\Omega$	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	65°C/W
FBR522ND09-W1	9 VDC	100 $\Omega$	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR522ND10-W1	10 VDC	135 $\Omega$	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR522ND12-W1	12 VDC	180 $\Omega$	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

\* Pulse drive

## ■ SUITABLE APPLICATIONS

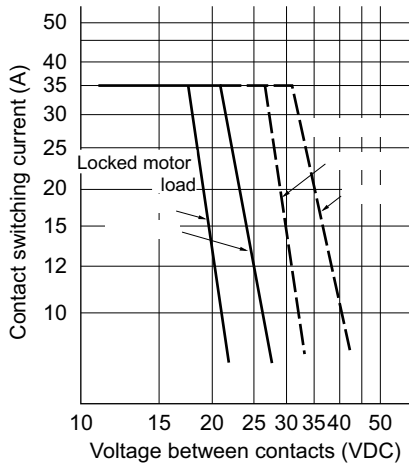
Application	Normal load current (12 VDC system)	Description	Recommended model (example)	
			For 16 V or less motor load voltage	For instantaneous 20 V or more load voltage
Power Windows	20 to 25 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Automatic Door 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.

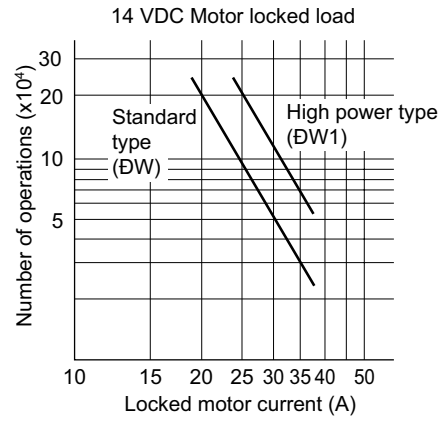
# FBR512, 522 SERIES

## CHARACTERISTIC DATA

### 1. MAXIMUM BREAK CAPACITY



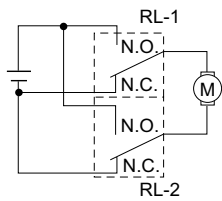
### 2. LIFE



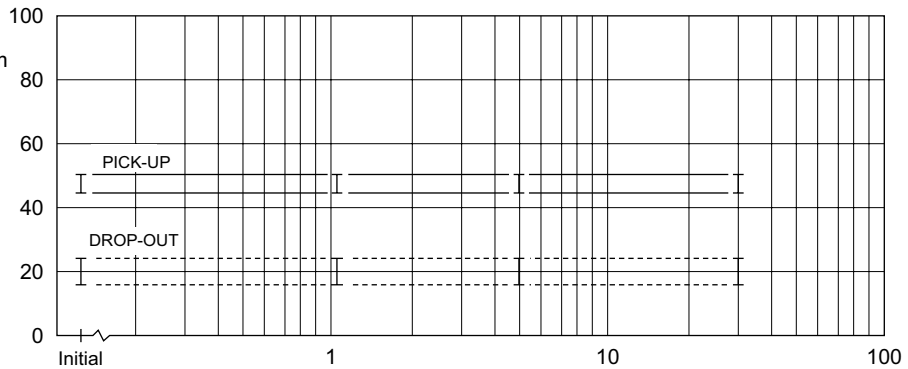
### 3. LIFE TEST (EXAMPLE)

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

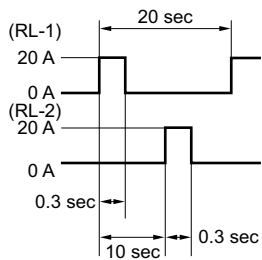
- Test circuit



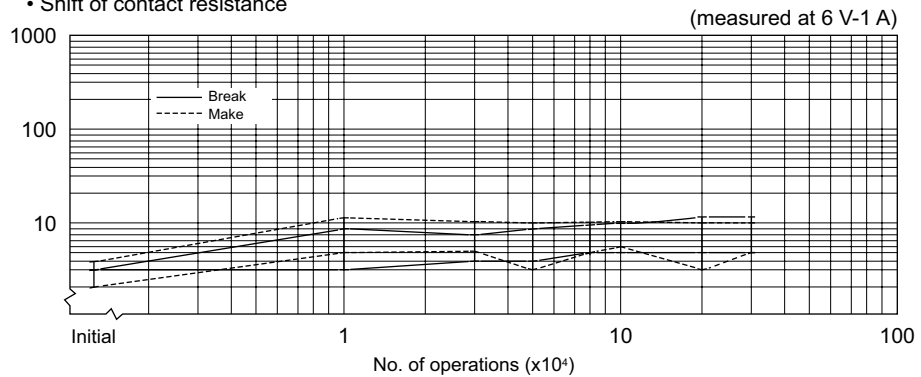
- Shift of pick-up and drop-out voltage



- Current wave form

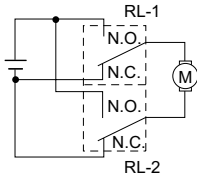


- Shift of contact resistance

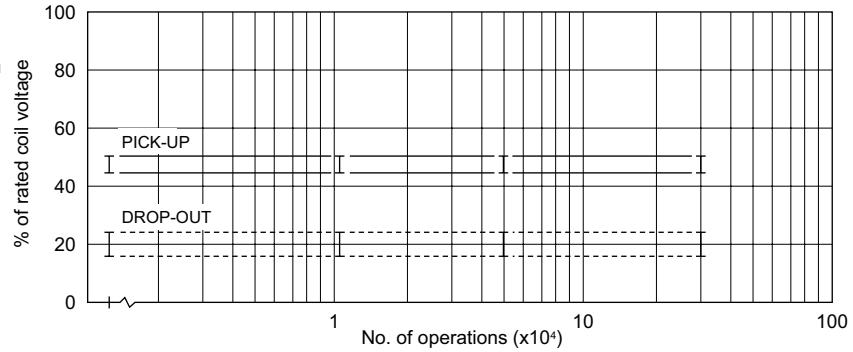


# FBR512, 522 SERIES

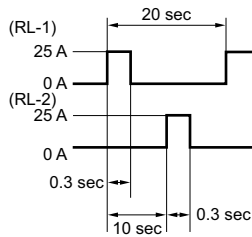
- Test item  
14 V DC-25 A  
Motor lock  
200,000 operations minimum  
(FBR512 □-W1 type)
- Test circuit



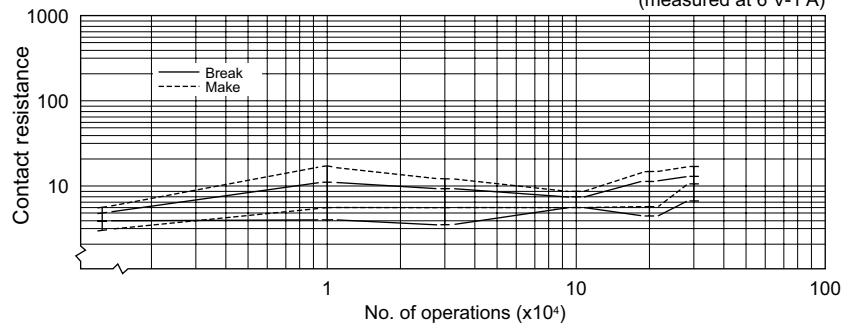
- Shift of pick-up and drop-out voltage



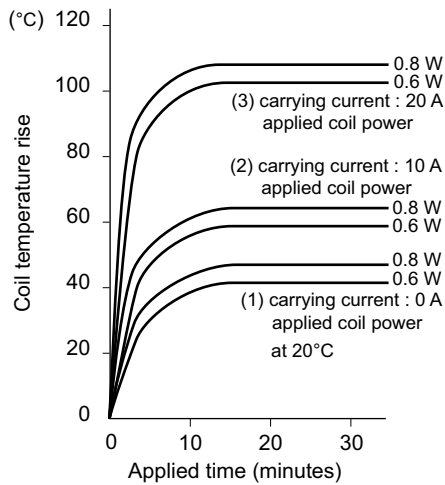
- Current wave form



- Shift of contact resistance



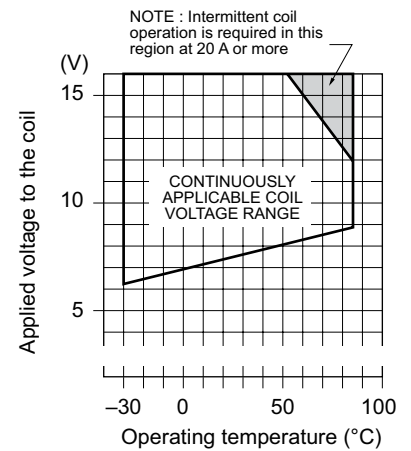
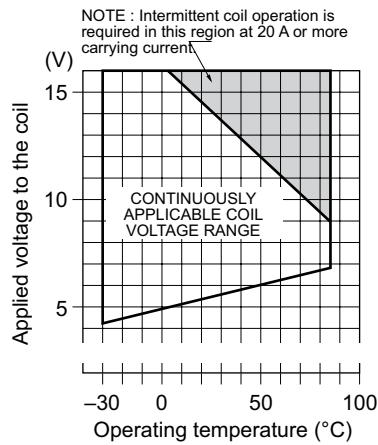
## 4. COIL TEMPERATURE RISE



## 5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

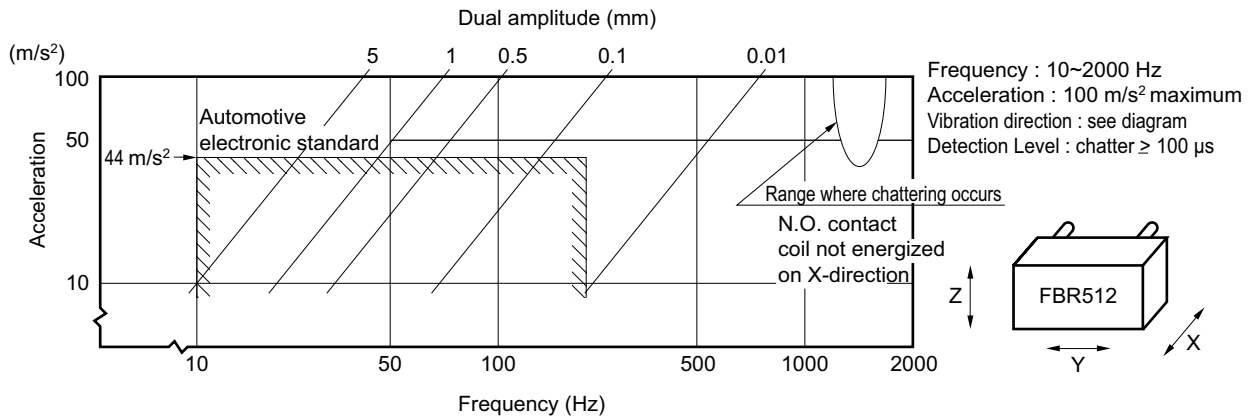
[ FBR512ND09-W ]

[ FBR512ND12-W ]

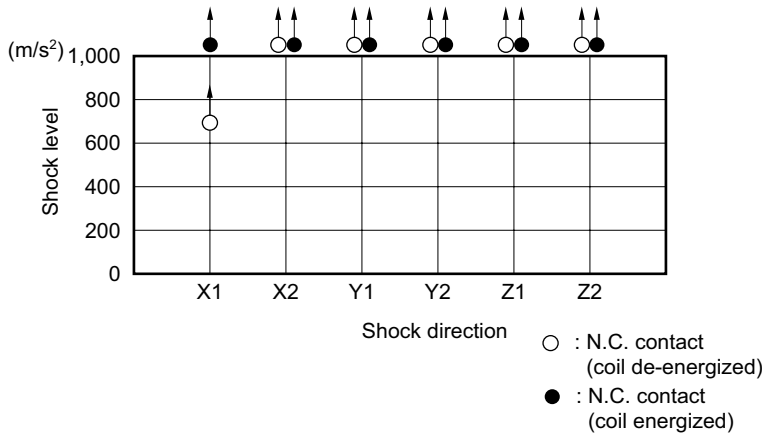


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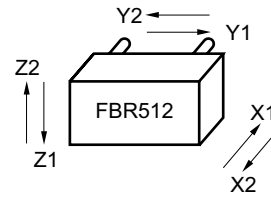
## 6. VIBRATION RESISTANCE CHARACTERISTICS



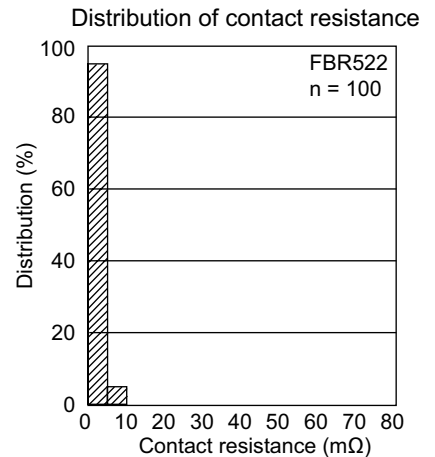
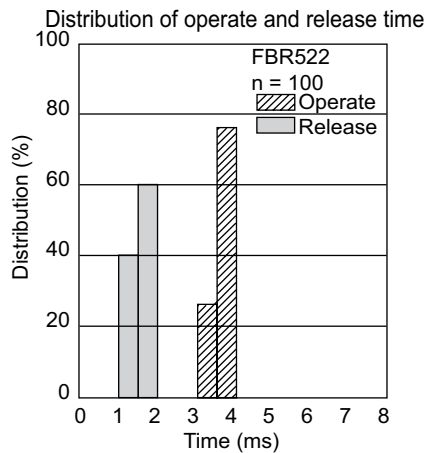
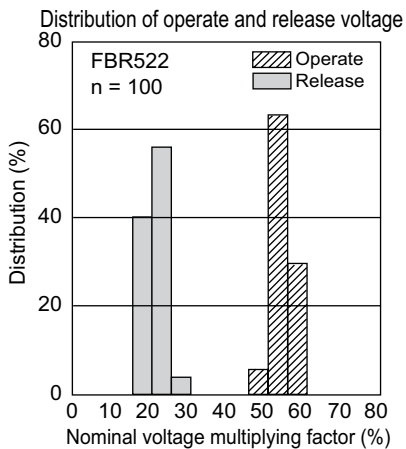
## 7. SHOCK RESISTANCE CHARACTERISTICS



Shock application time : 11 ms, half-sine wave  
 Test material : coil, energized and de-energized  
 Shock direction : see diagram  
 Detection Level : chatter ≥ 100 μs



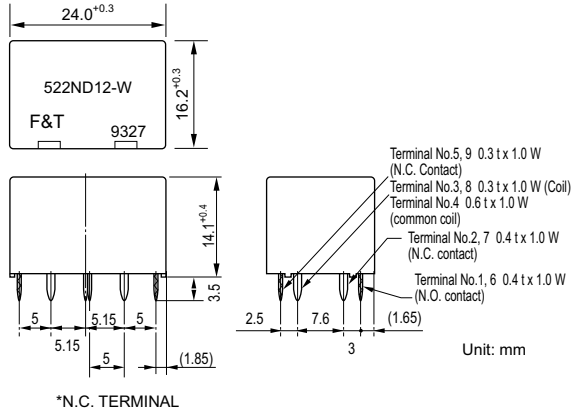
## ■ REFERENCE DATA



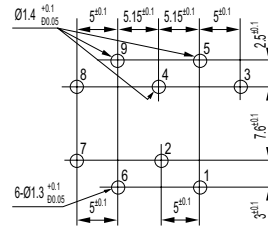
# FBR512, 522 SERIES

## ■ DIMENSIONS

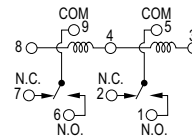
### ● Dimensions



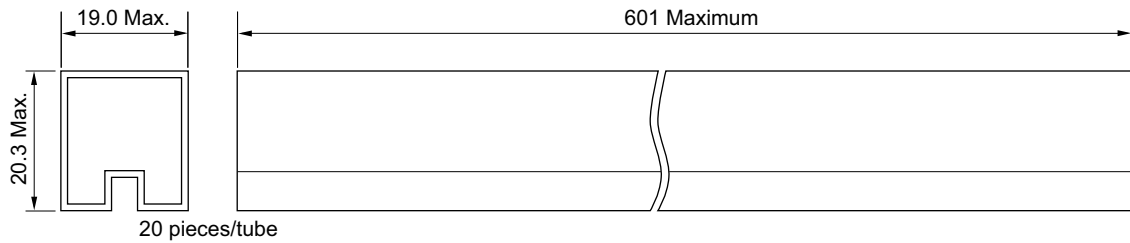
### ● PC board mounting hole layout (BOTTOM VIEW)



### ● Schematic (BOTTOM VIEW)



### ● Tube carrier



Unit: mm

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