

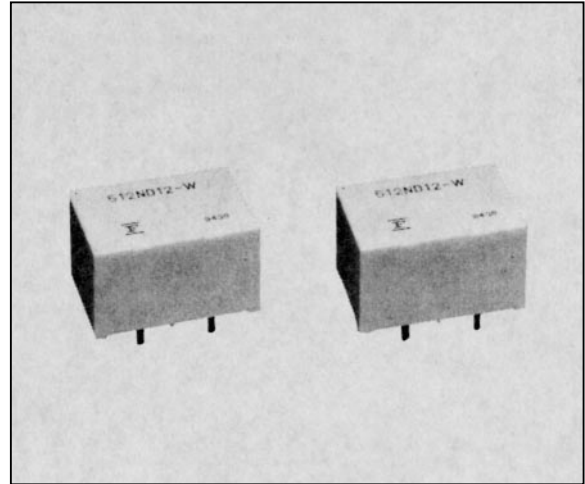
COMPACT POWER TWIN RELAY

1 POLE × 2–20 A (FOR AUTOMOTIVE APPLICATIONS)

FBR510, 520 SERIES

■ FEATURES

- Two independent relays mounted in a single package
- Miniature size
(54% the volume as compared with two FBR160 relays)
- High current contact capacity
(carrying current: 35 A/10 min, 25 A/1 Hr)
- High resistance to vibration and shock
- Improved Heat Resistance and Extended Operating Range
- Two types of contact gap
(FBR510: 0.3 mm, FBR520: 0.6 mm)



■ ORDERING INFORMATION

[Example] $\frac{\text{FBR512}}{\text{(a)}}$ $\frac{\text{N}}{\text{(b)}}$ $\frac{\text{D12}}{\text{(c)}}$ - $\frac{\text{W}}{\text{(d)}}$ $\frac{\text{**}}{\text{(e)}}$

(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	W : Silver-Tin oxide indium
(e)	Custom Designation	To be assigned custom specification

FBR510,520 SERIES

■ SPECIFICATIONS

Item		Specifications	
Contact	Arrangement	1 Form C × 2 (SPDT × 2)	
	Material	Silver-Tin oxide indium	
	Voltage Drop (Resistance)	Max. 100 mV (at 2 A 12 VDC)	
	Rating	14 VDC 20 A (Locked Motor Load) 14 VDC Inrush 20 A, Break 4 A (Motor Free Load)	
	Max. Carrying Current	35 A/10 min. 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*1 (Reference)	1 A 6 VDC	
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 ⁶ ops. min.	
	Electrical	200 × 10 ³ ops. min. (Locked Motor Load) 400 × 10 ³ ops. min. (Motor Free Load)	
Other	Vibration Resistance		10 to 55 Hz (double amplitude of 1.5 mm)
	Shock Resistance	Misoperation	100 m/s ² (11 ±1 ms)
		Endurance	1,000 m/s ² (11 ±1 ms)
	Unit Mass		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.

■ COIL DATA CHART

1. FBR512 Series

MODEL	Nominal Voltage	Coil resistance (±10%) (at 20°C)	Must Operate Voltage	Thermal Resistance
FBR512ND06-W	6 VDC	60 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	73°C/W
FBR512ND09-W	9 VDC	135 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR512ND10-W	10 VDC	180 Ω	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR512ND12-W	12 VDC	240 Ω	7.3 VDC (at 20°C) 9.0 VDC (at 85°C)	

FBR510,520 SERIES

2. FBR522 Series

MODEL	Nominal Voltage	Coil resistance (±10%) (at 20°C)	Must Operate Voltage	Thermal Resistance
FBR522ND06-W	6 VDC	45 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	65°C/W
FBR522ND09-W	9 VDC	100 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR522ND10-W	10 VDC	135 Ω	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR522ND12-W	12 VDC	180 Ω	7.3 VDC (at 20°C) 9.0 VDC (at 85°C)	

■ SUITABLE APPLICATION

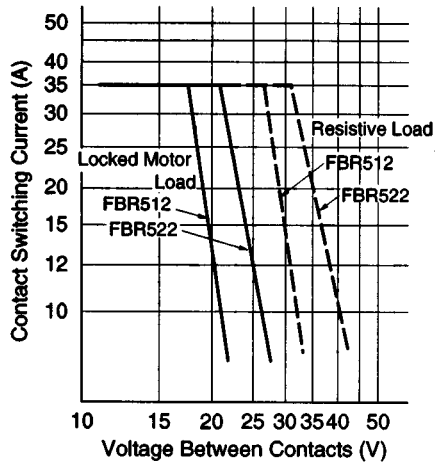
Application	Normal Load Current (12 VDC System)	Description	Recommendable Model (Example)	
			For 16 V or less motor load voltage	For instantaneous 20 V or more load voltage
Power Windows	20 to 25 A (switching at motor locking)	Forward and Reverse Motor Control	FBR512N□ -W	FBR522N□ -W
Automatic Door Lock	18 to 25 A (switching at motor locking)	Forward and Reverse Motor Control	FBR512N□ -W	FBR522N□ -W
Automatic Antenna	8 to 12 A (INRUSH) Break 2 A Max. (motor-free)	Forward and Reverse Motor Control	FBR512N□ -W	
Intermittent Wipers (Front and Rear)	15 to 30 A Break 2 to 8 A (motor-free)	Forward Only	FBR512N□ -W	FBR522N□ -W
Tilt-Lock Wheel	20 A (switching at motor locking)	Forward and Reverse Motor Control	FBR512N□ -W	FBR522N□ -W
Power Seat	20 to 30 A (switching at motor locking)	Forward and Reverse Motor Control	FBR512N□ -W	FBR522N□ -W
Sunroof	20 to 30 A (switching at motor locking)	Forward and Reverse Motor Control	FBR512N□ -W	FBR522N□ -W

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

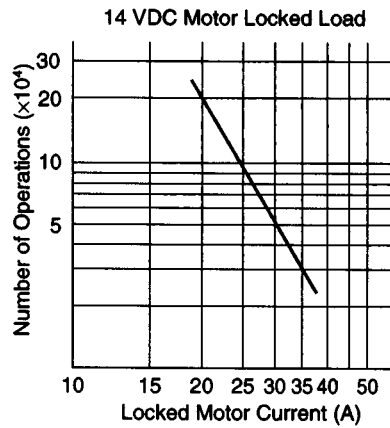
FBR510,520 SERIES

CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



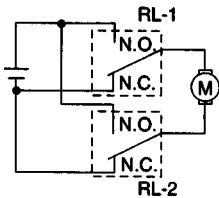
2. LIFE



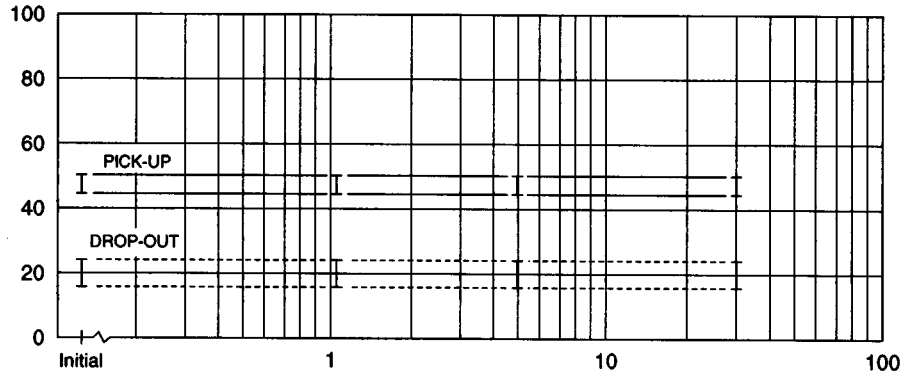
3. LIFE TEST (EXAMPLE)

- Test Item
14 V DC-20 A
Motor Lock
200,000 ops. min.
(FBR512 □-W type)

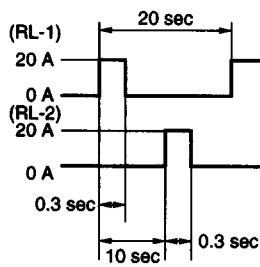
• Test Circuit



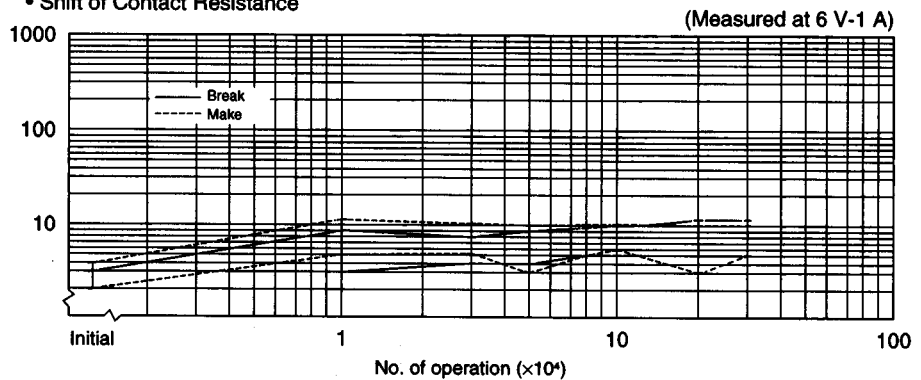
• Shift of Pick-up and Drop-out Voltage



• Current Wave Form

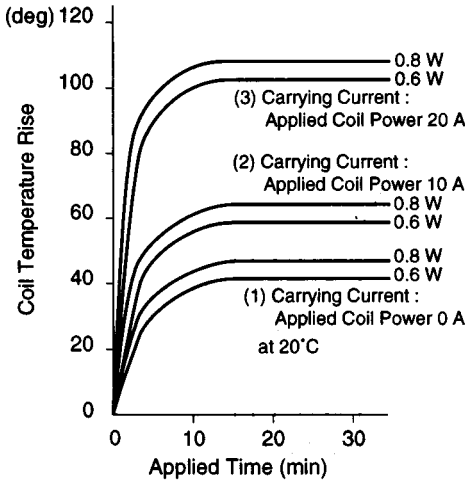


• Shift of Contact Resistance



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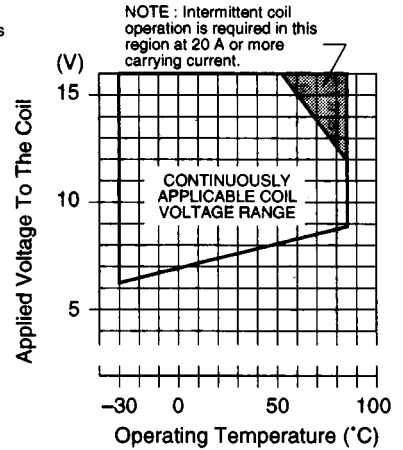
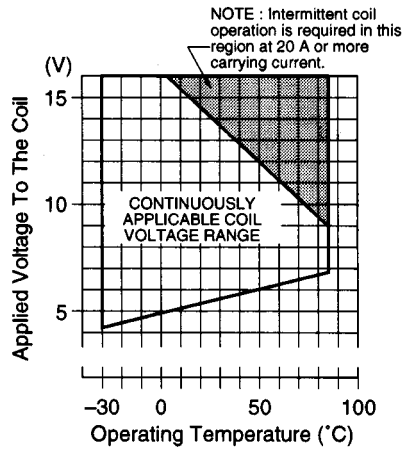
4. COIL TEMPERATURE RISE



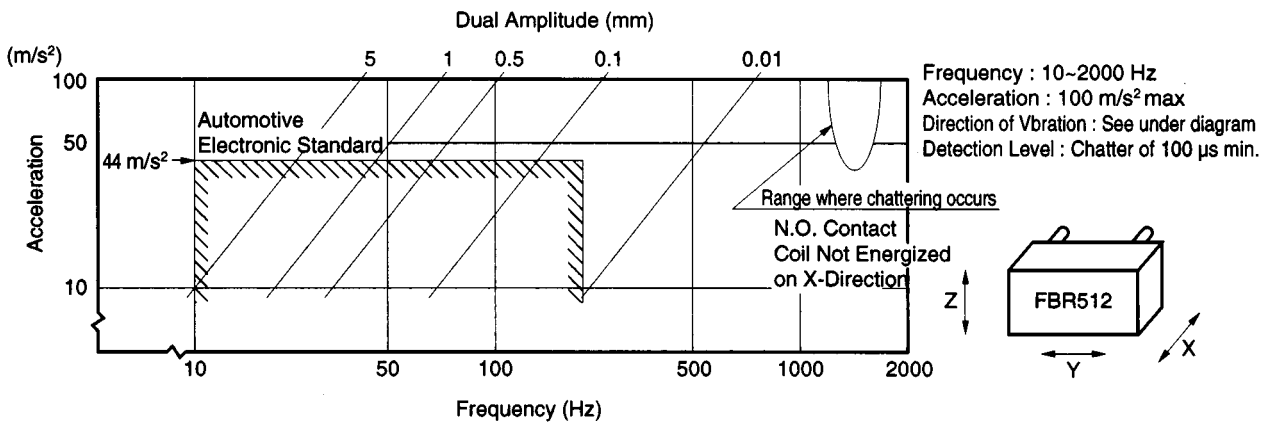
5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

[FBR512ND09-W]

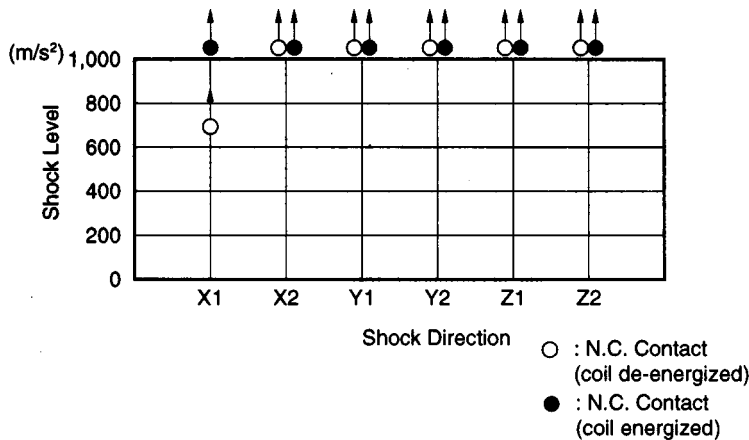
[FBR512ND12-W]



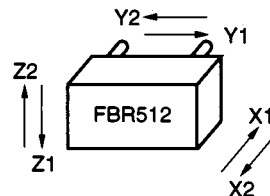
6. VIBRATION RESISTANCE CHARACTERISTICS



7. SHOCK RESISTANCE CHARACTERISTICS

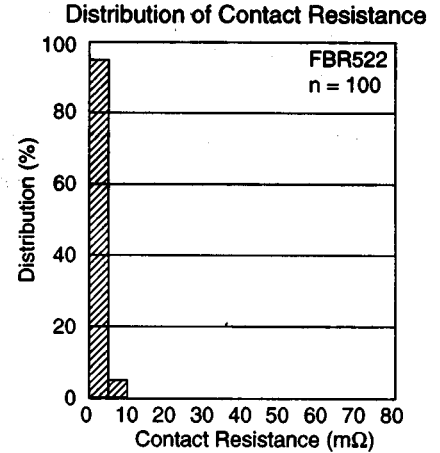
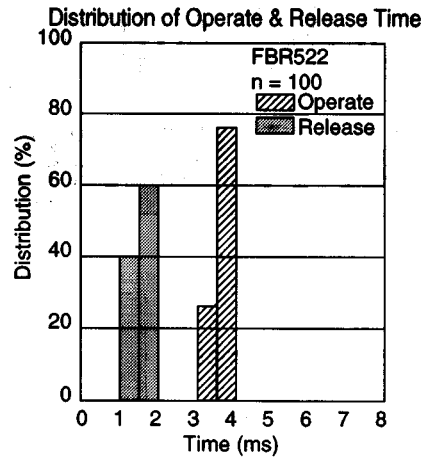
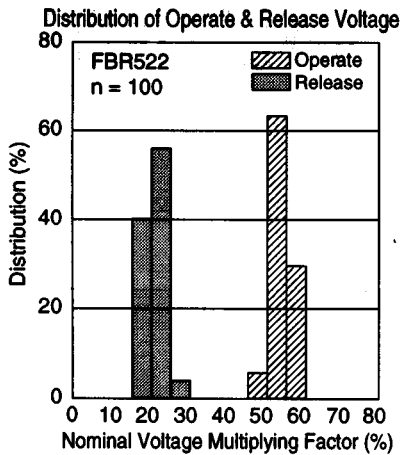


Shock Application Time : 11 ms, Half-Sine Wave
Test Material : Coil, Energized and De-Energized
Shock Direction : Set under diagram
Detection Level : Chatter of 100 μs min.



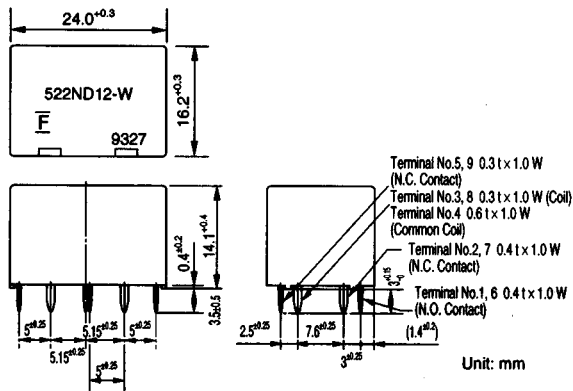
FBR510,520 SERIES

REFERENCE DATA

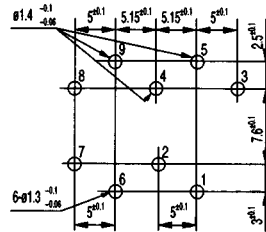


DIMENSIONS

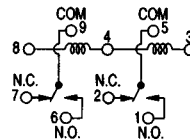
Dimensions



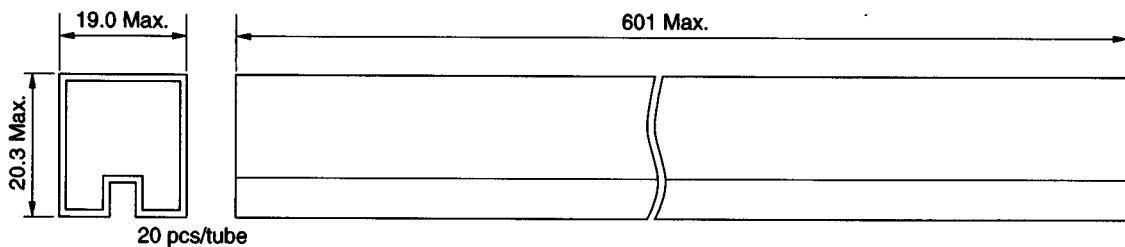
PC board mounting hole layout (BOTTOM VIEW)



Schematics (BOTTOM VIEW)



Tube carrier



Unit: mm