

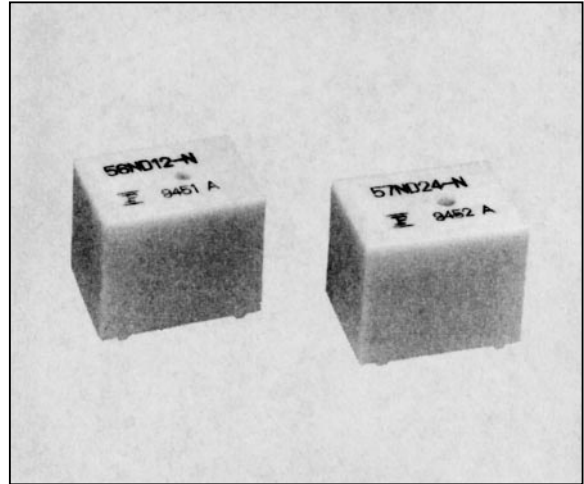
# COMPACT HIGH POWER RELAY

## 1 POLE-30 A (FOR AUTOMOTIVE APPLICATIONS)

### FBR56, 57 SERIES

#### ■ FEATURES

- High power contact capacity  
(carrying current: 40 A/2 min. 30 A/1 Hr)
- Available for controlling 24 V motors in trucks and other large vehicles (FBR57)
- High heat resistance and extended operating voltage



#### ■ ORDERING INFORMATION

[Example]  $\frac{\text{FBR56}}{\text{(a)}} \frac{\text{N}}{\text{(b)}} \frac{\text{D12}}{\text{(c)}} - \frac{\text{W}}{\text{(d)}} \frac{\text{**}}{\text{(e)}}$

(a)	Series Name	FBR56: FBR56 Series Relay for 12 V battery (Contact Gap 0.4 mm) FBR57: FBR57 Series Relay for 24 V battery (Contact Gap 0.8 mm)
(b)	Enclosure	N : Plastic Sealed Type
(c)	Nominal Voltage	D06 : 6 VDC D09 : 9 VDC D12 : 12 VDC D24 : 24 VDC
(d)	Contact Material	W : Silver-Tin oxide indium N : Silver copper nickel
(e)	Custom Designation	To be assigned custom specification

# FBR56, 57 SERIES

## ■ SPECIFICATIONS

Item		FBR56 Series	FBR57 Series
Contact	Arrangement	1 Form C	
	Material	Silver-Tin oxide indium (-W Type) Silver copper nickel (-N Type)	
	Voltage Drop (Resistance)	Max. 100 mV (at 2 A 12 VDC)	
	Ratings	14 VDC 20 A (Locked Motor Load) 14 VDC Inrush 20 A, Break 4 A (Motor Free Load)	28 VDC 12 A (Locked Motor Load) 28 VDC Inrush 15 A, Break 2.5 A (Motor Free Load)
	Max. Carrying Current	40 A/2 min. 30 A/1 Hr. (25°C, 100% Rated Coil Voltage)	
	Max. Inrush Current	-W Type: 60 A (Reference) -N Type: 40 A	
	Max. Switching Current	40 A 16 VDC (Reference)	12 A 28 VDC (Reference)
	Min. Switching Load* <sup>1</sup>	-W Type: 6 VDC, 1 A -N Type: 6 VDC, 2 A (Reference)	
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	100 × 10 <sup>3</sup> ops. min. (Locked Motor Load) 1 × 10 <sup>6</sup> ops. min. (Motor Free Load)	100 × 10 <sup>3</sup> ops. min. (Locked Motor Load) 500 × 10 <sup>3</sup> ops. min. (Motor Free Load)
Other	Vibration Resistance	10 to 55 Hz (double amplitude of 1.5 mm)	
	Shock Resistance	Misoperation	100 m/s <sup>2</sup> (11 ± 1 ms)
		Endurance	1,000 m/s <sup>2</sup> (11 ± 1 ms)
	Unit Mass	Approx. 9.4 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. FBR56 Series

MODEL		Nominal Voltage	Coil resistance (±10%) (at 20°C)	Must Operate Voltage	Thermal Resistance
W contact	N contact				
FBR56ND06-W	FBR56ND06-N	6 VDC	42 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	77°C/W
FBR56ND09-W	FBR56ND09-N	9 VDC	95 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR56ND12-W	FBR56ND12-N	12 VDC	170 Ω	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

# FBR56, 57 SERIES

## 2. FBR57 Series

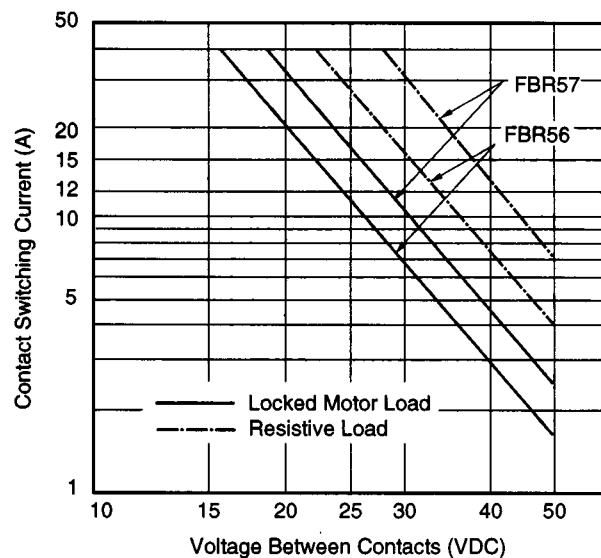
MODEL		Nominal Voltage	Coil resistance (±10%) (at 20°C)	Must Operate Voltage	Thermal Resistance
W contact	N contact				
FBR57ND24-W	FBR57ND24-N	24 VDC	384 Ω	14.4 VDC (at 20°C) 18.0 VDC (at 85°C)	67°C/W

## ■ PRINCIPAL APPLICATION

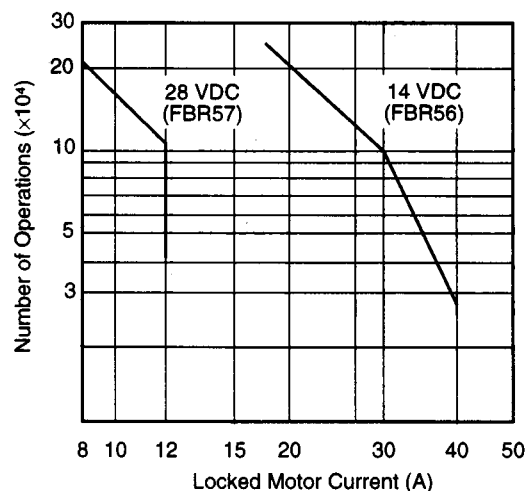
Application		Normal Load Current	Life × 10 <sup>3</sup>	Recommendable Model (Example)
For 12 V battery	Power Windows	20 to 30 A (switching at motor locking)	100	FBR56N□-W
	Automatic Door Lock	18 to 30 A/4 to 5 door (switching at motor locking)	100	FBR56N□-W
	Intermittent Wipers	INRUSH 15 to 30 A BREAK 2 to 8 A (motor free)	300	FBR56N□-N
	Tilt-Lock Wheel	INRUSH 15 A BREAK 2.5 A (motor free)	100	FBR56N□-W
	Sunroof	20 to 30 A (switching at motor locking)	100	FBR56N□-W
	Others	Car Audio System, etc.	—	
For 24 V battery	Power Windows	10 to 12 A (switching at motor locking)	100	FBR57N□-W
	Automatic Door Lock	5 A/2 door (switching at motor locking)	100	FBR57N□-W
	Intermittent Wipers	INRUSH 15 to 30 A BREAK 2 to 8 (motor free)	300	FBR57N□-W

## ■ CHARACTERISTIC DATA

### 1. MAXIMUM BREAK CAPACITY

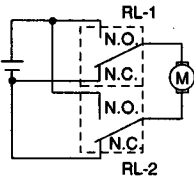


### 2. LIFE

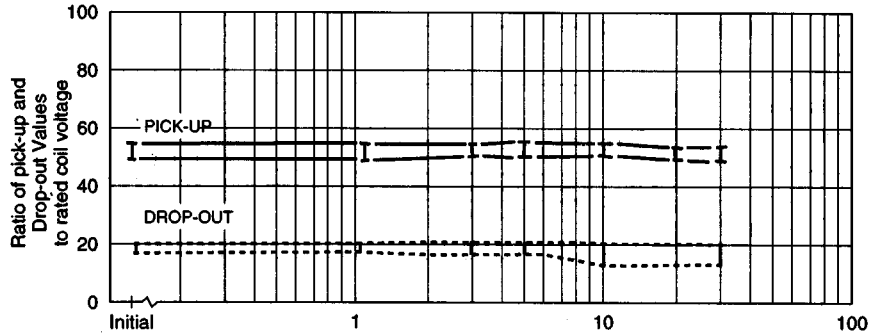


## 3. LIFE TEST (EXAMPLE)

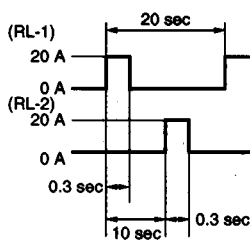
- Test Item  
14 V DC-20 A  
Motor Lock  
200,000 ops, min  
(FBR56 □-W type)
- Test Circuit



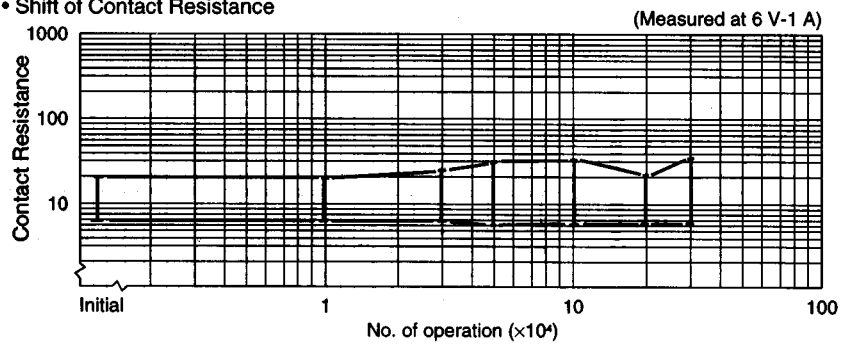
- Shift of Pick-up and Drop-out Voltage



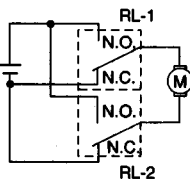
- Current Wave Form



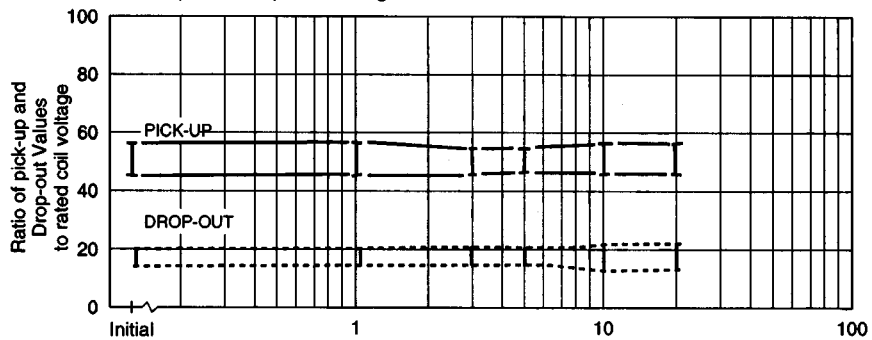
- Shift of Contact Resistance



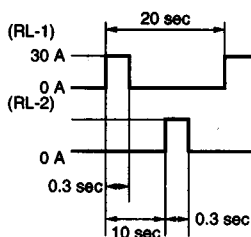
- Test Item  
14 V DC-30 A  
Motor Lock  
100,000 ops, min  
(FBR56 □-W type)
- Test Circuit



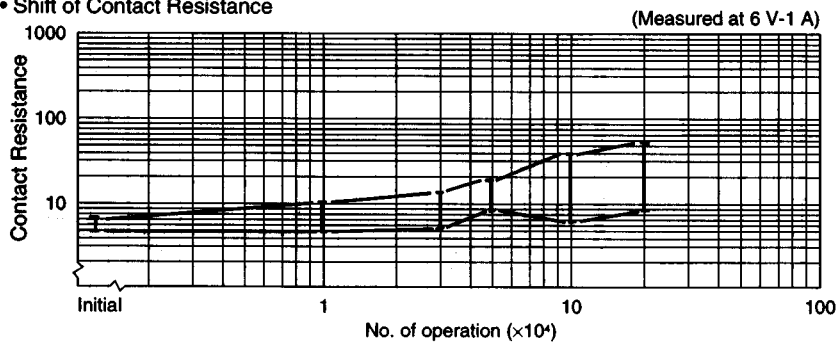
- Shift of Pick-up and Drop-out Voltage



- Current Wave Form



- Shift of Contact Resistance



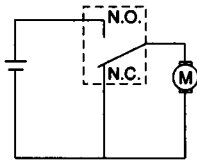
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# FBR56, 57 SERIES

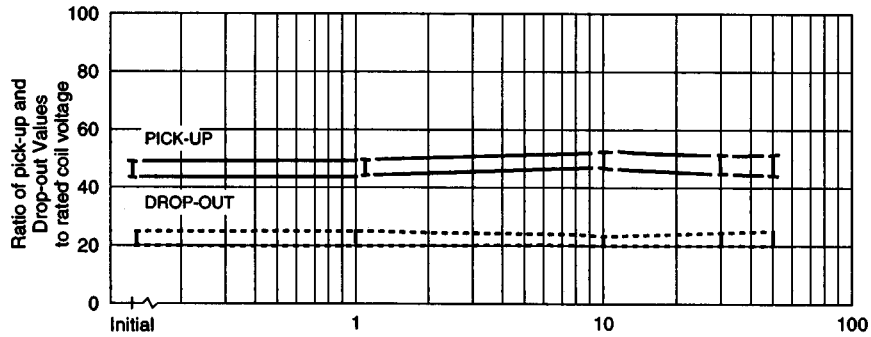
(Continued)

- Test Item  
16 V DC-25 A INRUSH  
Motor Free  
400,000 ops, min  
(FBR56 □ -N type)

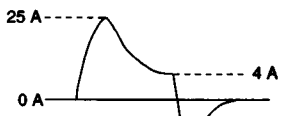
• Test Circuit



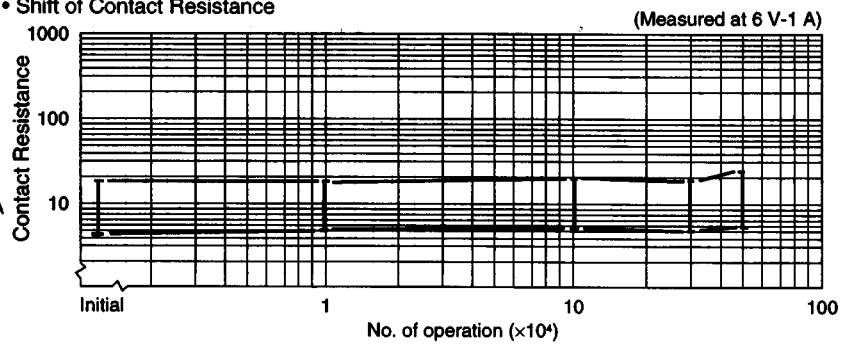
• Shift of Pick-up and Drop-out Voltage



• Current Wave Form

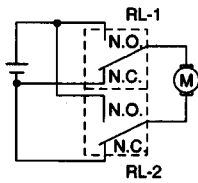


• Shift of Contact Resistance

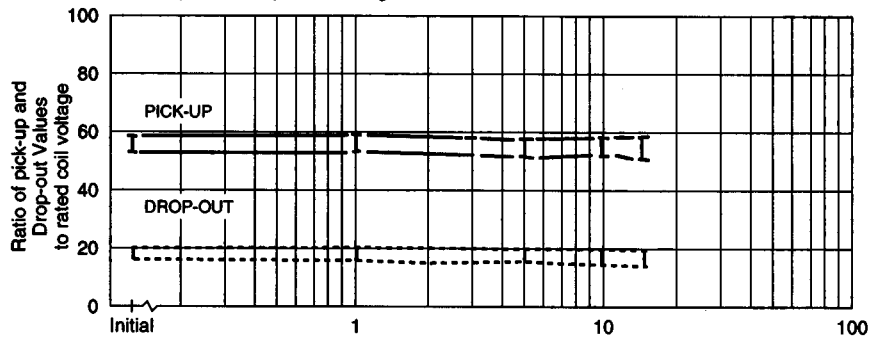


- Test Item  
28 V DC-12 A INRUSH  
Motor Lock  
100,000 ops, min  
(FBR57 □ -W type)

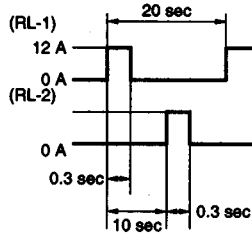
• Test Circuit



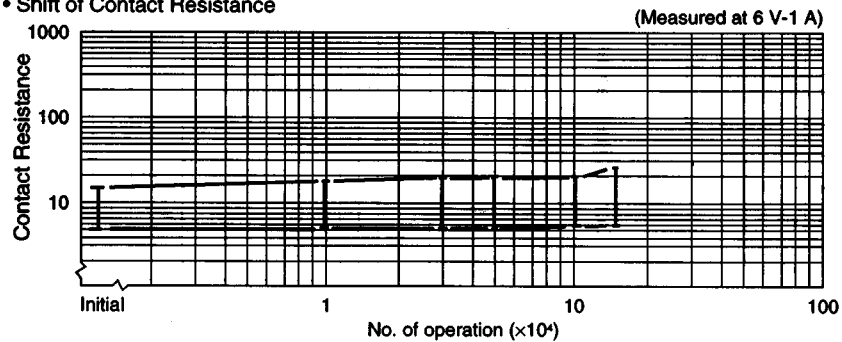
• Shift of Pick-up and Drop-out Voltage



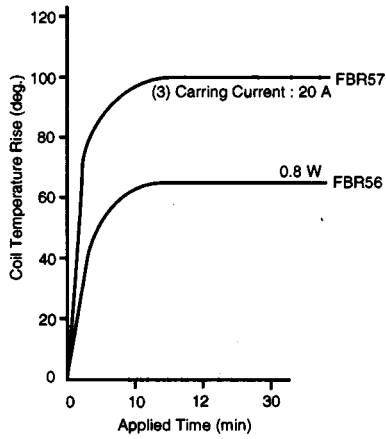
• Current Wave Form



• Shift of Contact Resistance

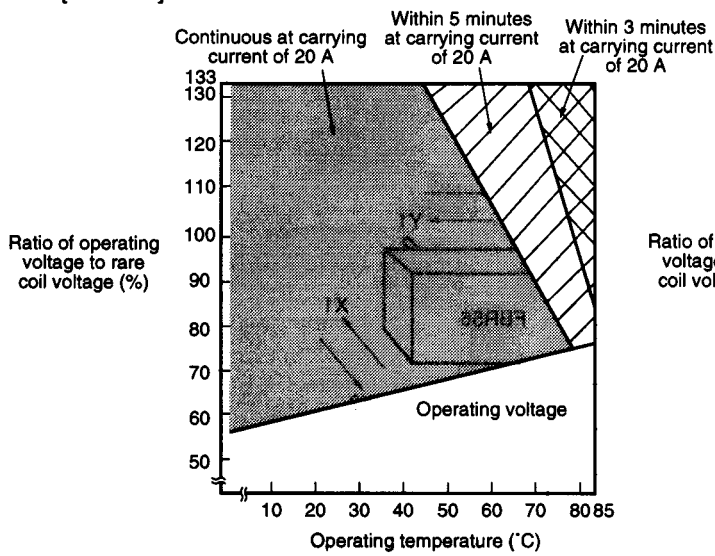


## 4. COIL TEMPERATURE RISE

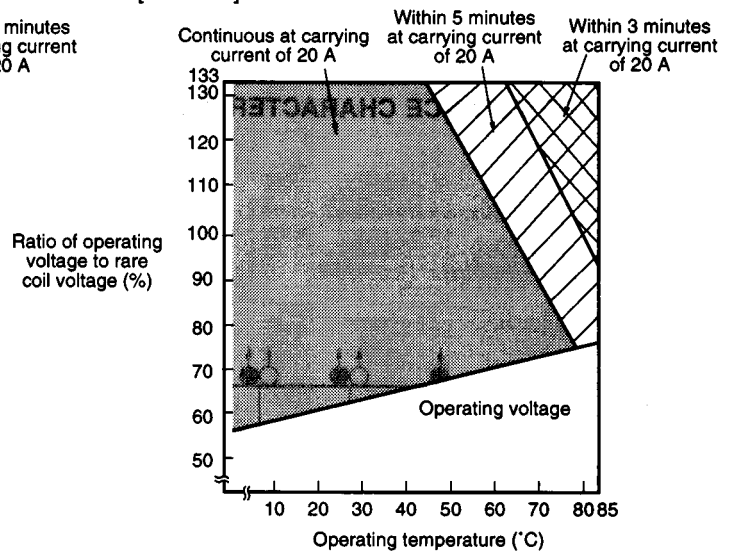


## 5. OPERATING COIL VOLATGE RANGE (EXAMPLE)

[ FBR56 ]

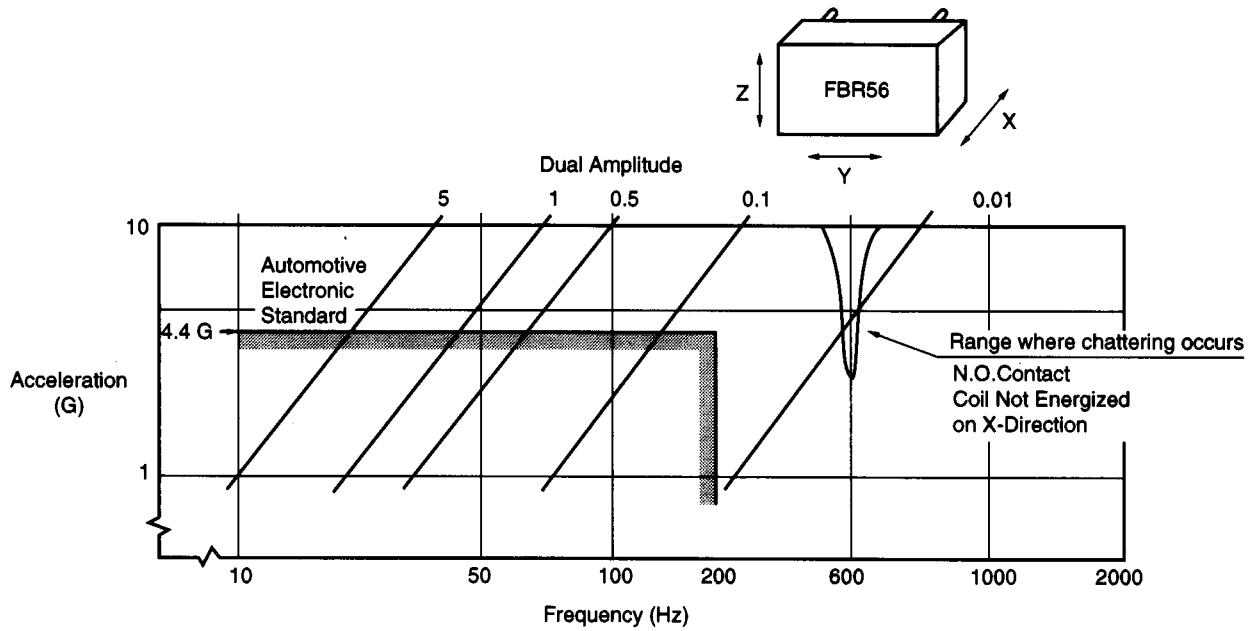


[ FBR57 ]

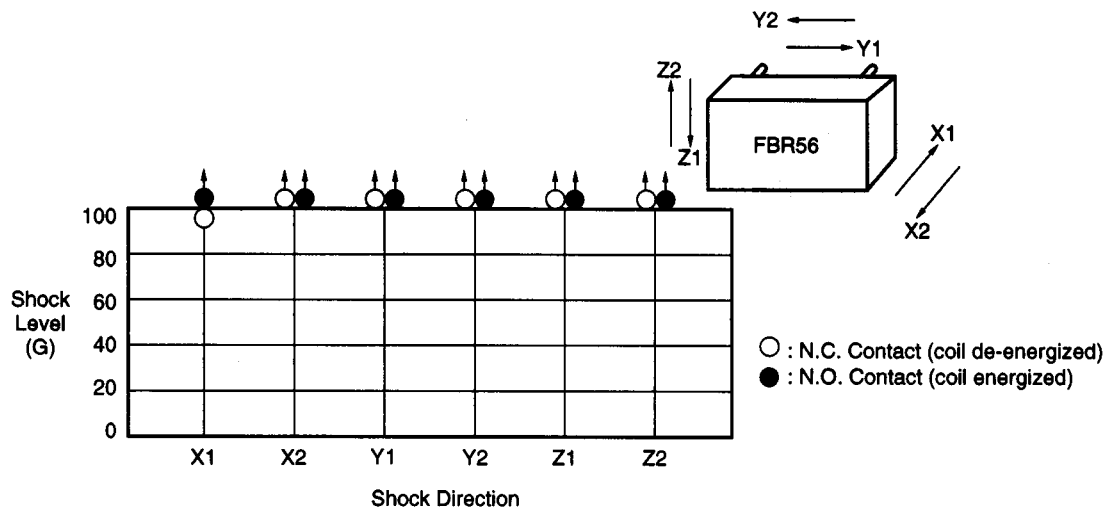


# FBR56, 57 SERIES

## 6. VIBRATION RESISTANCE CHARACTERISTICS

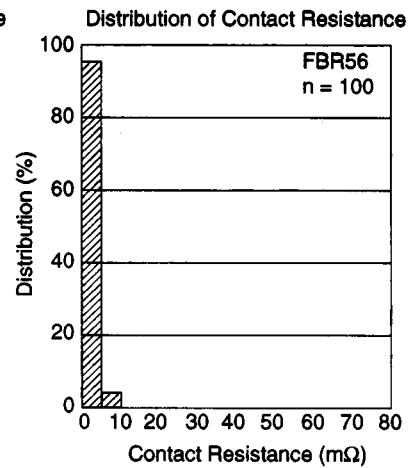
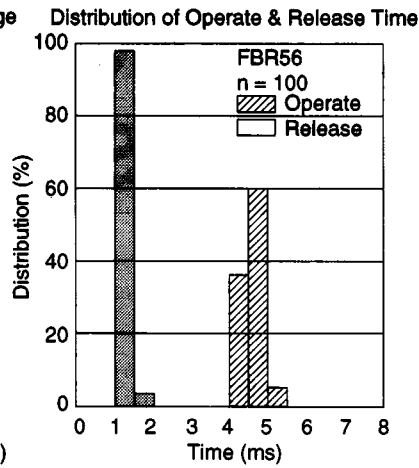
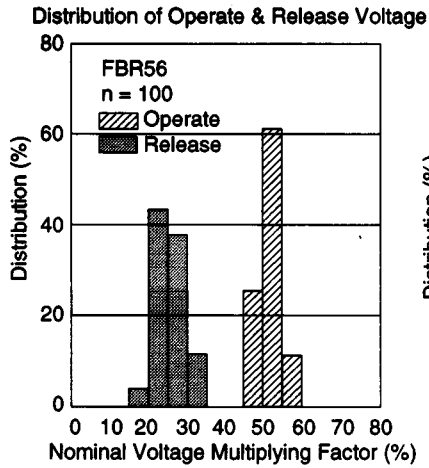


## 7. SHOCK RESISTANCE CHARACTERISTICS



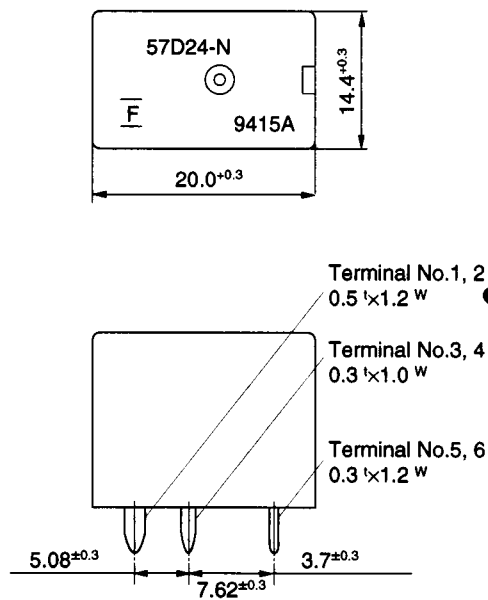
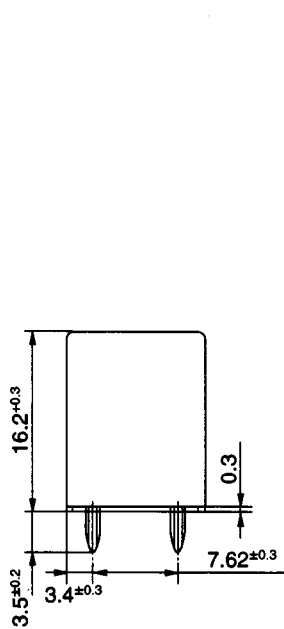
# FBR56, 57 SERIES

## REFERENCE DATA

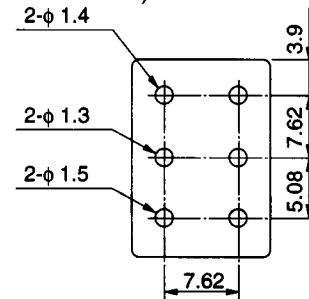


## DIMENSIONS

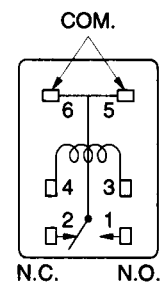
### Dimensions



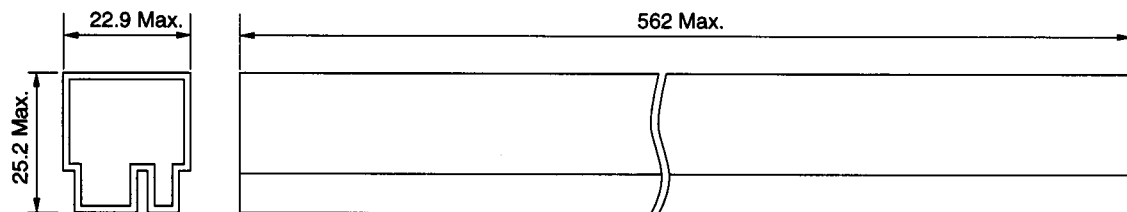
### PC board mounting hole layout (BOTTOM VIEW)



### Schematics (BOTTOM VIEW)



### Tube carrier



35 pcs/tube

Unit : mm