

COMPACT HIGH POWER RELAY

1 POLE—30 A

(FOR AUTOMOTIVE APPLICATIONS)

FBR56 SERIES

■ FEATURES

- High power contact capacity
(carrying current: 40 A/2 minutes, 30 A/1 hour)
- High heat resistance and extended operating voltage



■ ORDERING INFORMATION

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

(a)	Series Name	FBR56 : FBR56 Series relay for 12 V battery (contact gap 0.4 mm)
(b)	Enclosure	N : Plastic sealed type
(c)	Nominal Voltage	D06 : 6 VDC D09 : 9 VDC D12 : 12 VDC
(d)	Contact Material	W : Silver-tin oxide indium N : Silver copper nickel
(e)	Custom Designation	To be assigned custom specification

■ SPECIFICATIONS

Item			Specifications
Contact	Arrangement		1 form C
	Material		Silver-tin oxide indium (–W type) Silver copper nickel (–N type)
	Voltage Drop (resistance)		Maximum 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)
	Maximum Carrying Current		40 A/2 minutes, 30 A/1 hour (25°C, 100% rated coil voltage)
	Maximum Inrush Current		–W type: 60 A (reference) –N type: 40 A
	Maximum Switching Current		40 A 16 VDC (reference)
	Minimum Switching Load*1		–W type: 6 VDC, 1 A –N type: 6 VDC, 2 A (reference)
Coil	Operating Temperature		–40°C to +85°C (no frost) (refer to the CHARACTERISTIC DATA)
	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		10 × 10 ⁶ operations minimum
	Electrical		100 × 10 ³ operations minimum (locked motor load) 1 × 10 ⁶ operations minimum (motor free 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 9.4 g

*1 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

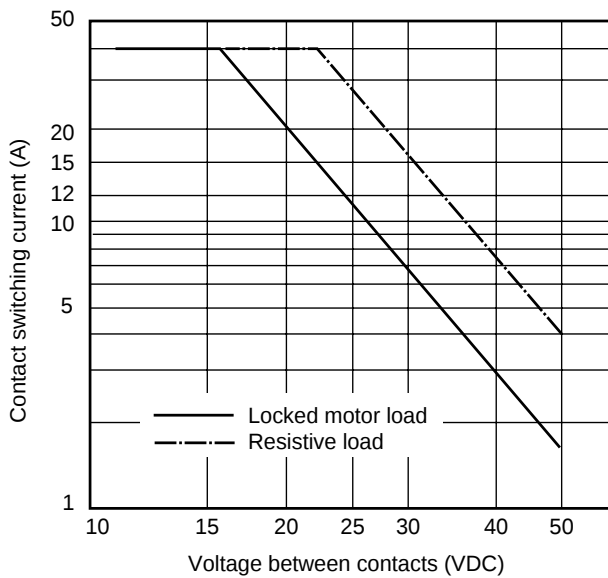
MODEL		Nominal voltage	Coil resistance (±10%) (at 20°C)	Must operate voltage	Thermal resistance
W contact	N contact				
FBR56ND06-W	FBR56ND06-N	6 VDC	42 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	77°C/W
FBR56ND09-W	FBR56ND09-N	9 VDC	95 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR56ND12-W	FBR56ND12-N	12 VDC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

■ PRINCIPAL APPLICATIONS

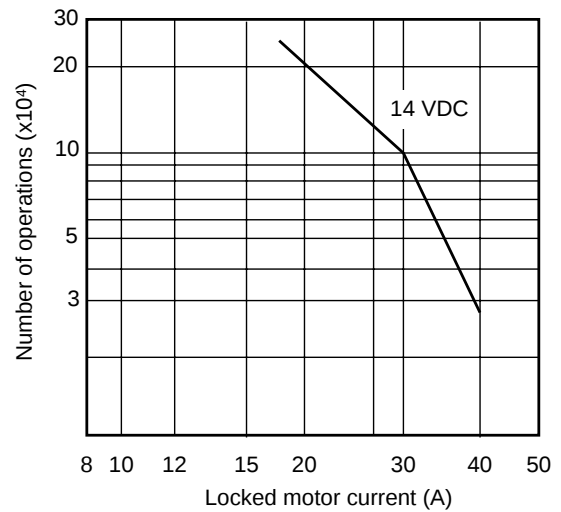
Application		Normal load current	Life x 10 ³	Recommended model (Example)
For 12 V battery	Power Windows	20 to 30 A (switching at motor locking)	100	FBR56N□-W
	Automatic Door Lock	18 to 30 A/4 to 5 door (switching at motor locking)	100	FBR56N□-W
	Intermittent Wipers	INRUSH 15 to 30 A BREAK 2 to 8 A (motor 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.	—	FBR56N□-W

■ CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



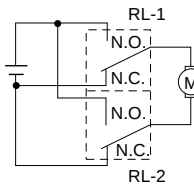
2. LIFE



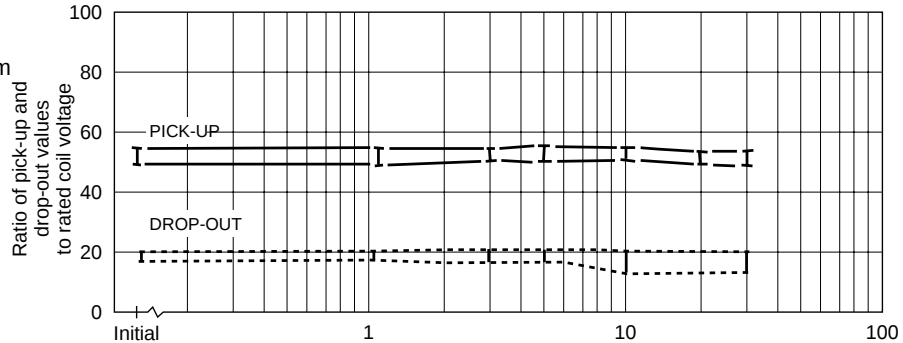
3. LIFE TEST (EXAMPLE)

- Test item
14 V DC-20 A
Motor lock
200,000 operations minimum
(FBR56 □-W type)

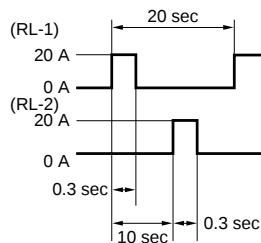
- Test circuit



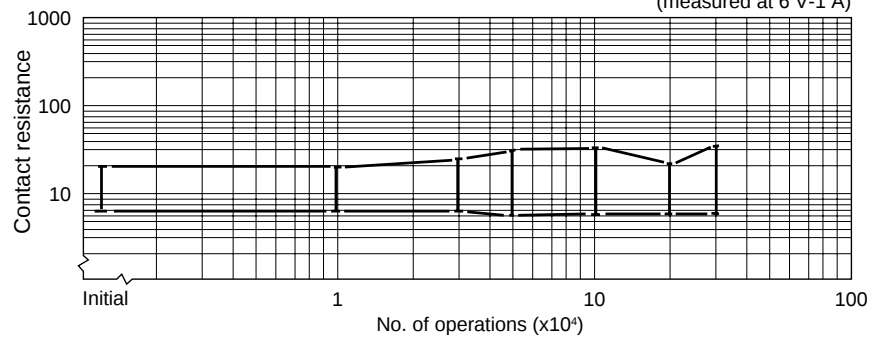
- Shift of pick-up and drop-out voltage



- Current wave form

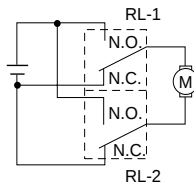


- Shift of contact resistance

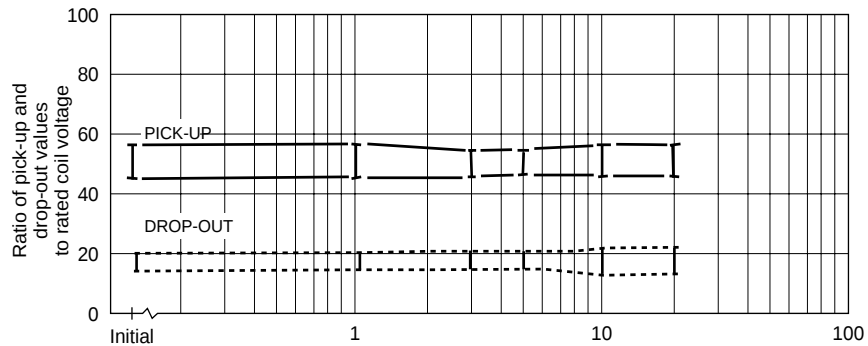


- Test item
14 V DC-30 A
Motor lock
100,000 operations minimum
(FBR56 □-W type)

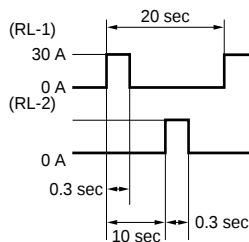
- Test circuit



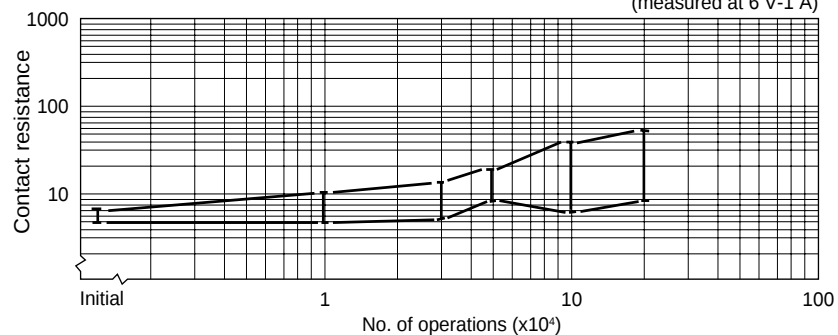
- Shift of pick-up and drop-out voltage



- Current wave form



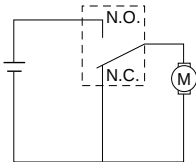
- Shift of contact resistance



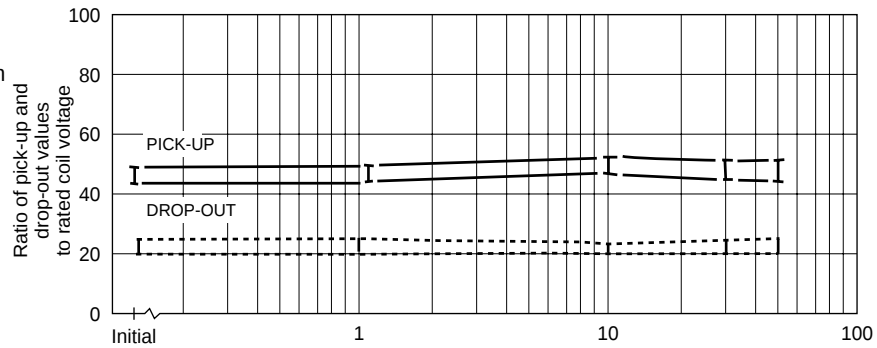
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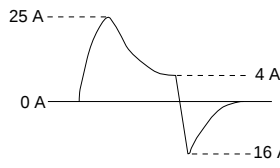
- Test item
16 V DC-25 A INRUSH
Motor free
400,000 operations minimum
(FBR56 □-N type)
- Test circuit



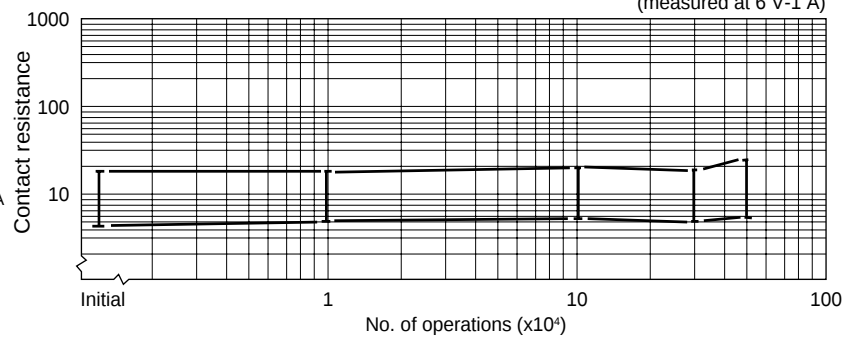
- Shift of pick-up and drop-out voltage



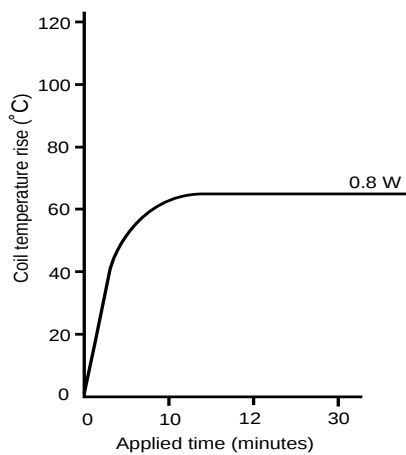
- Current wave form



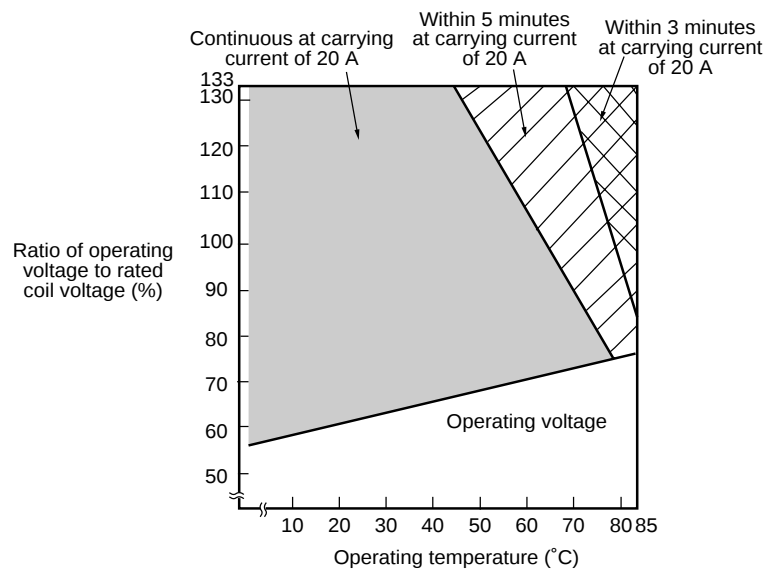
- Shift of contact resistance



4. COIL TEMPERATURE RISE

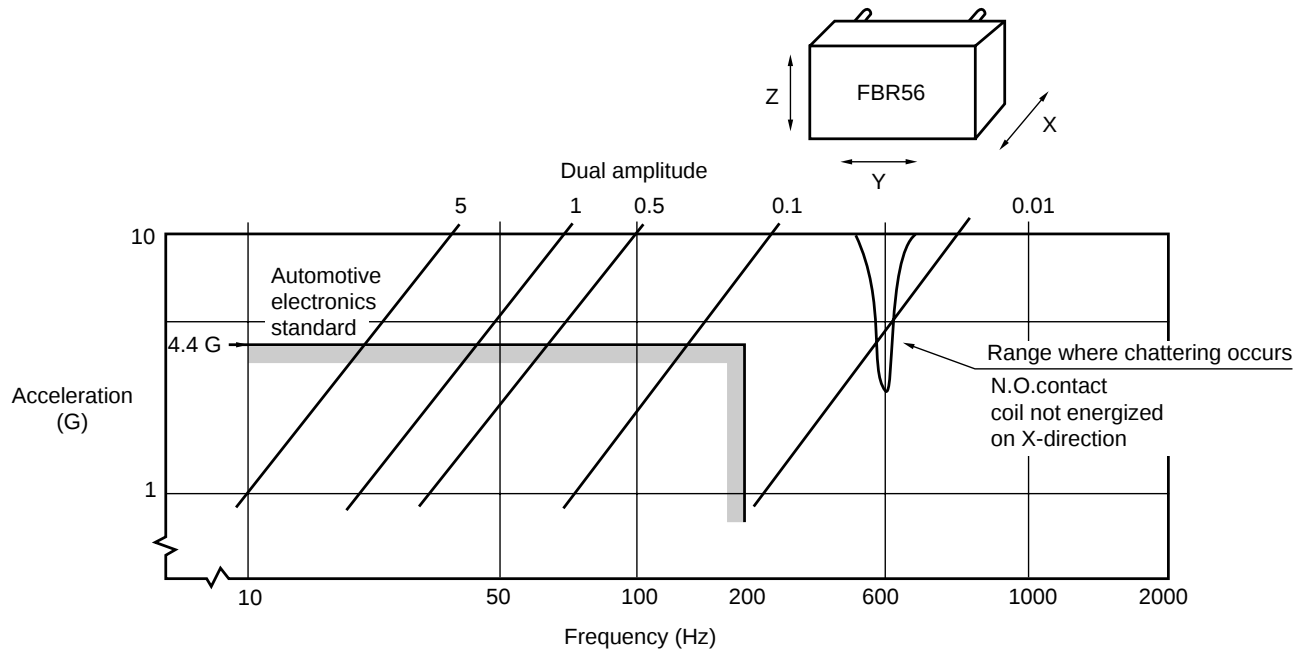


5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

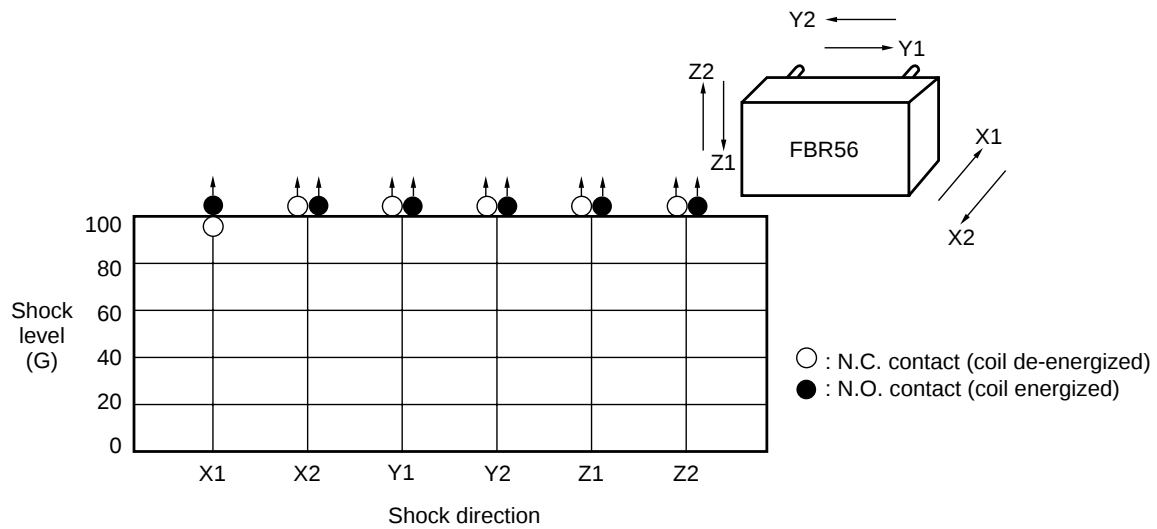


FBR56 SERIES

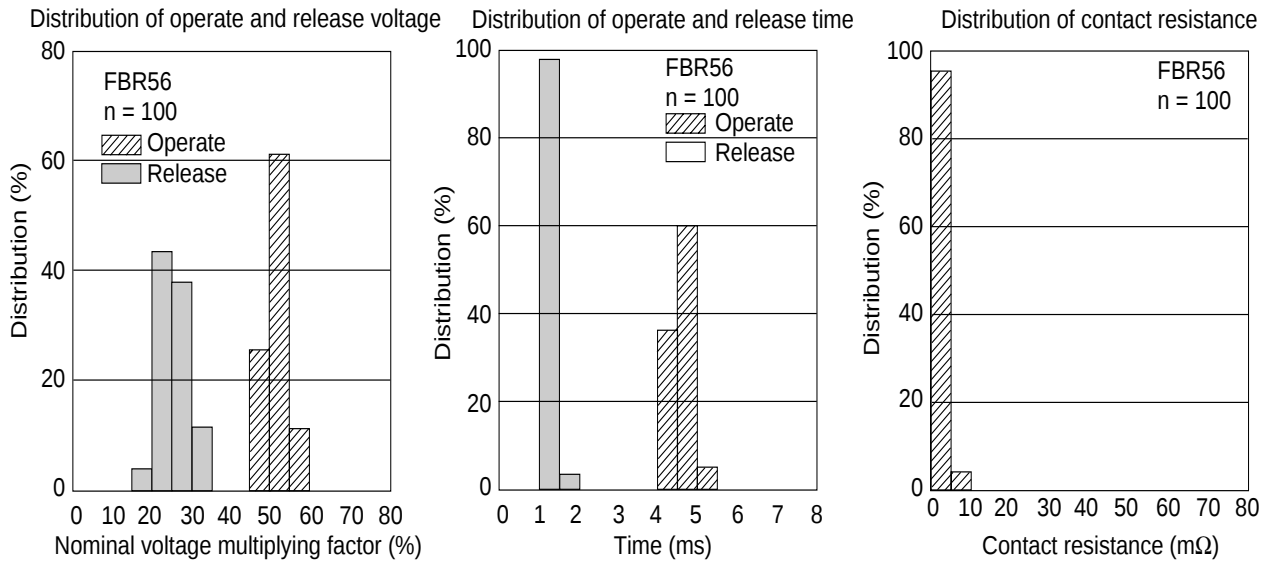
6. VIBRATION RESISTANCE CHARACTERISTICS



7. SHOCK RESISTANCE CHARACTERISTICS

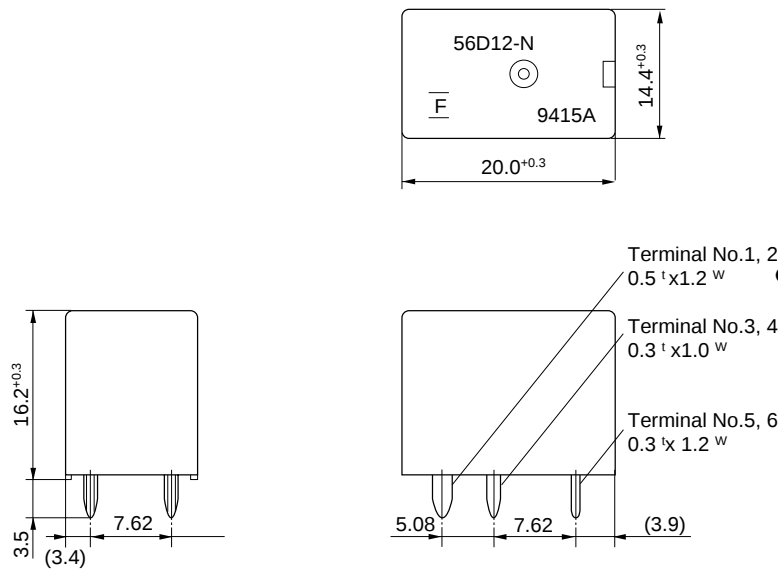


REFERENCE DATA

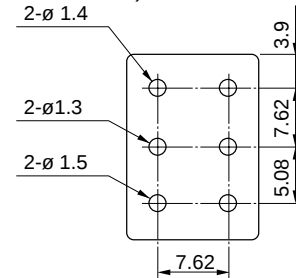


DIMENSIONS

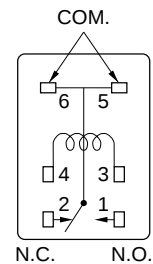
● Dimensions



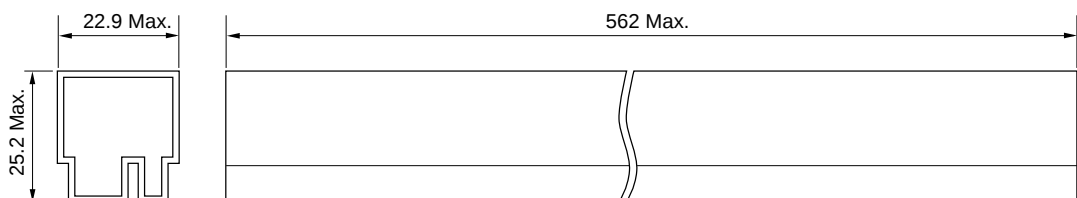
● PC board mounting hole layout (BOTTOM VIEW)



● Schematics (BOTTOM VIEW)



● Tube carrier



35 pcs/tube

Unit : mm

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