

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] $\frac{\text{FBR56}}{\text{(a)}} \frac{\text{N}}{\text{(b)}} \frac{\text{D12}}{\text{(c)}} - \frac{\text{W1}}{\text{(d)}} \frac{\text{**}}{\text{(e)}}$

(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	W1 : Silver-tin oxide indium
(e)	Custom Designation	To be assigned custom specification

FBR56 SERIES

■ SPECIFICATIONS

Item		Specifications	
Contact	Arrangement	1 form C	
	Material	Silver-tin oxide indium (-W1 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	-W1 type: 60 A (reference)	
	Maximum Switching Current	40 A 16 VDC (reference)	
	Minimum Switching Load*1	-W1 type: 6 VDC, 1 A	
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
W1 contact				
FBR56ND06-W1	6 VDC	42 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	77°C/W
FBR56ND09-W1	9 VDC	95 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR56ND12-W1	12 VDC	170 Ω	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

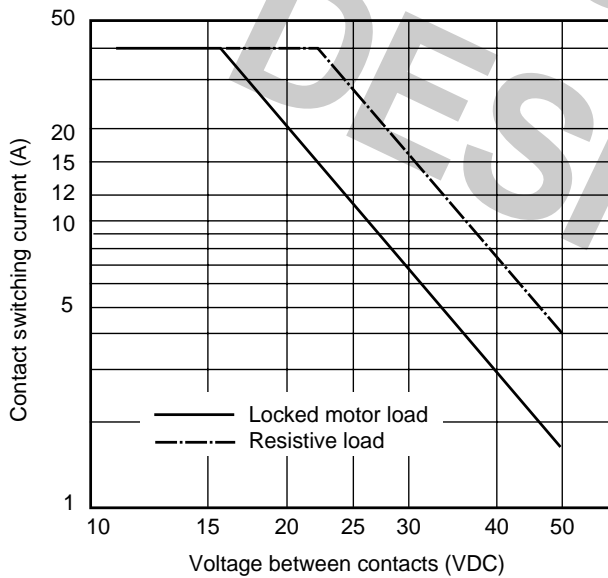
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■ PRINCIPAL APPLICATIONS

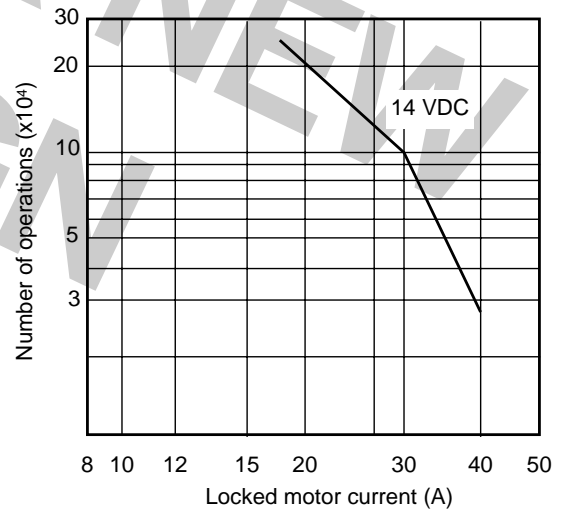
Application		Normal load current	Life x 10 ³	Recommended model (Example)
For 12 V battery	Power Windows	20 to 30 A (switching at motor locking)	100	FBR56N□-W1
	Automatic Door Lock	18 to 30 A/4 to 5 door (switching at motor locking)	100	FBR56N□-W1
	Intermittent Wipers	INRUSH 15 to 30 A BREAK 2 to 8 A (motor free)	300	FBR56N□-W1
	Tilt-Lock Wheel	INRUSH 15 A BREAK 2.5 A (motor free)	100	FBR56N□-W1
	Sunroof	20 to 30 A (switching at motor locking)	100	FBR56N□-W1
	Others	Car audio system, etc.	—	FBR56N□-W1

■ CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



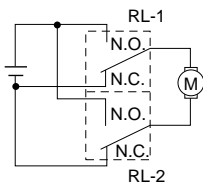
2. LIFE



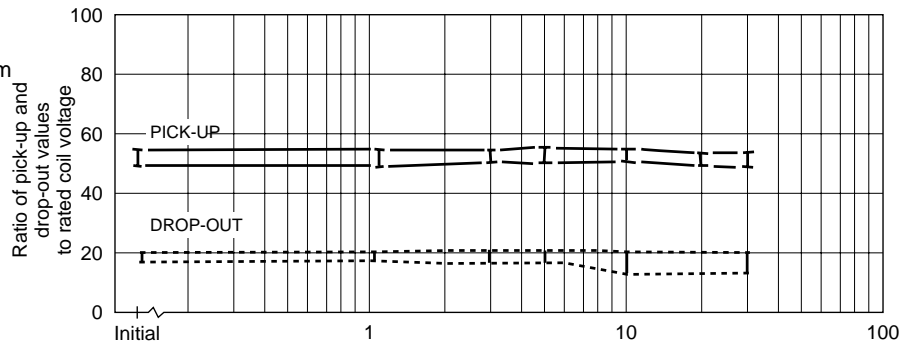
3. LIFE TEST (EXAMPLE)

- Test item
14 V DC-20 A
Motor lock
200,000 operations minimum
(FBR56 □-W1 type)

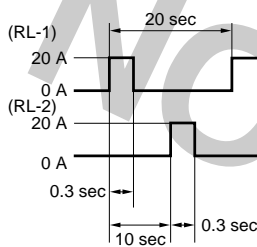
- Test circuit



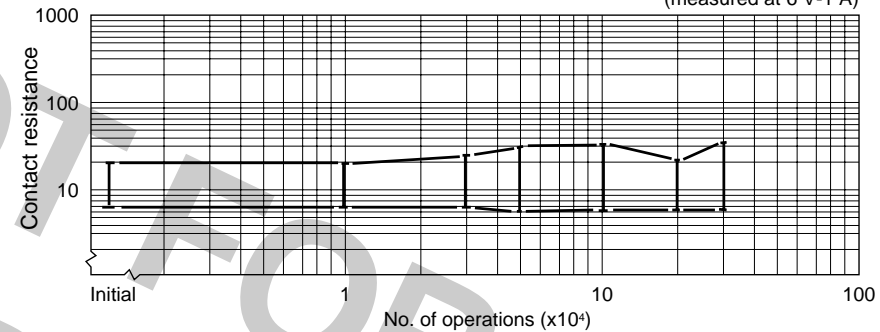
- Shift of pick-up and drop-out voltage



- Current wave form

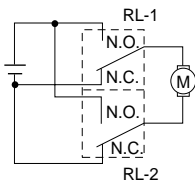


- Shift of contact resistance

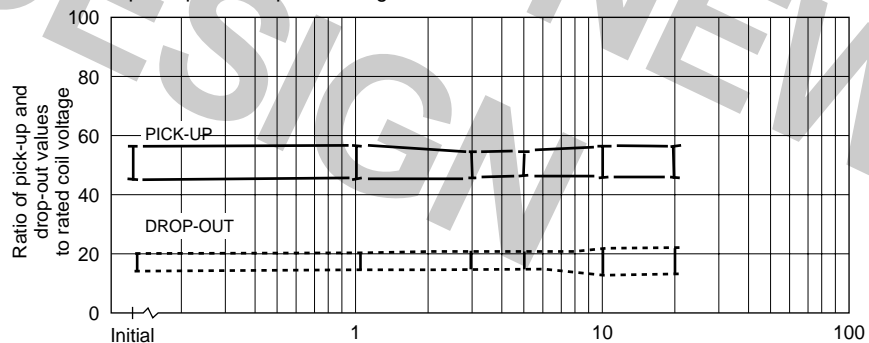


- Test item
14 V DC-30 A
Motor lock
100,000 operations minimum
(FBR56 □-W1 type)

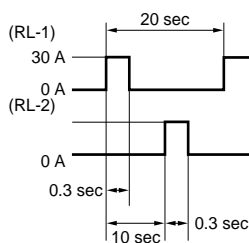
- Test circuit



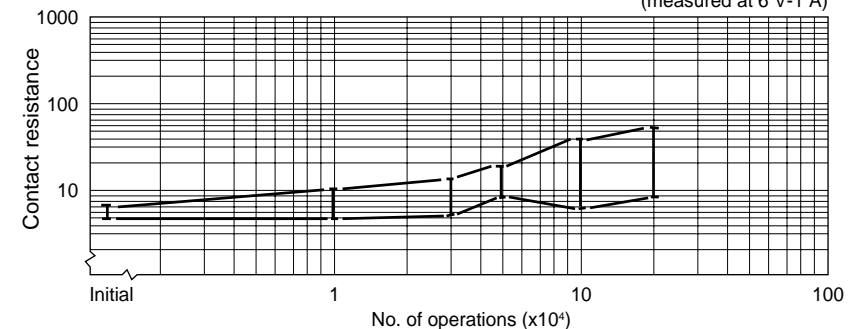
- Shift of pick-up and drop-out voltage



- Current wave form



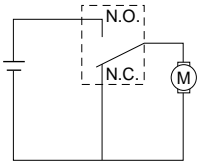
- Shift of contact resistance



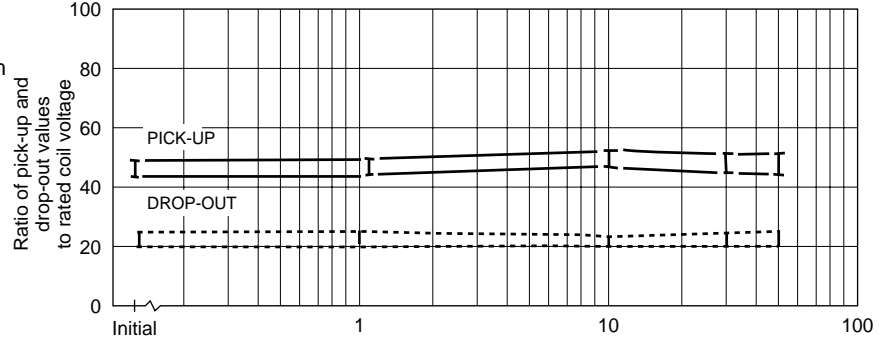
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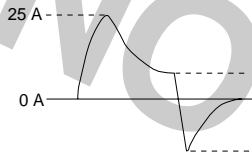
- Test item
16 V DC-25 A INRUSH
Motor free
400,000 operations minimum
(FBR56 □-W1 type)
- Test circuit



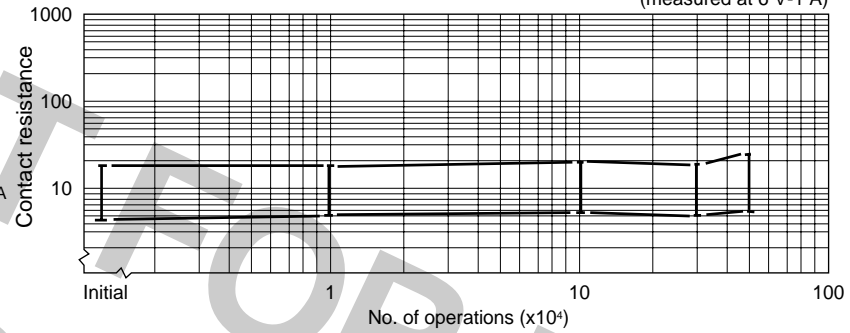
- Shift of pick-up and drop-out voltage



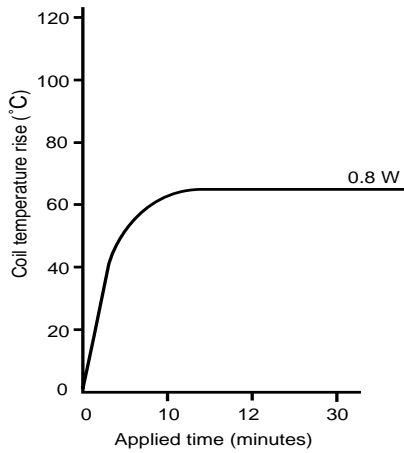
- Current wave form



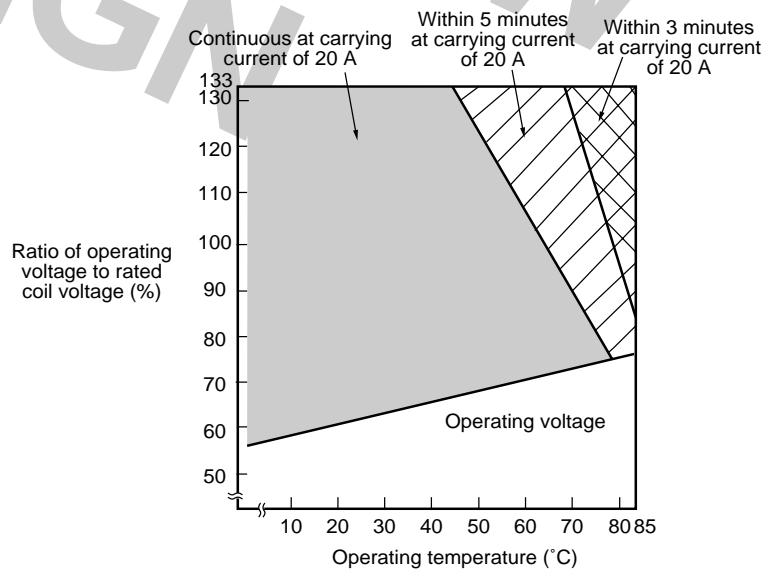
- Shift of contact resistance



4. COIL TEMPERATURE RISE

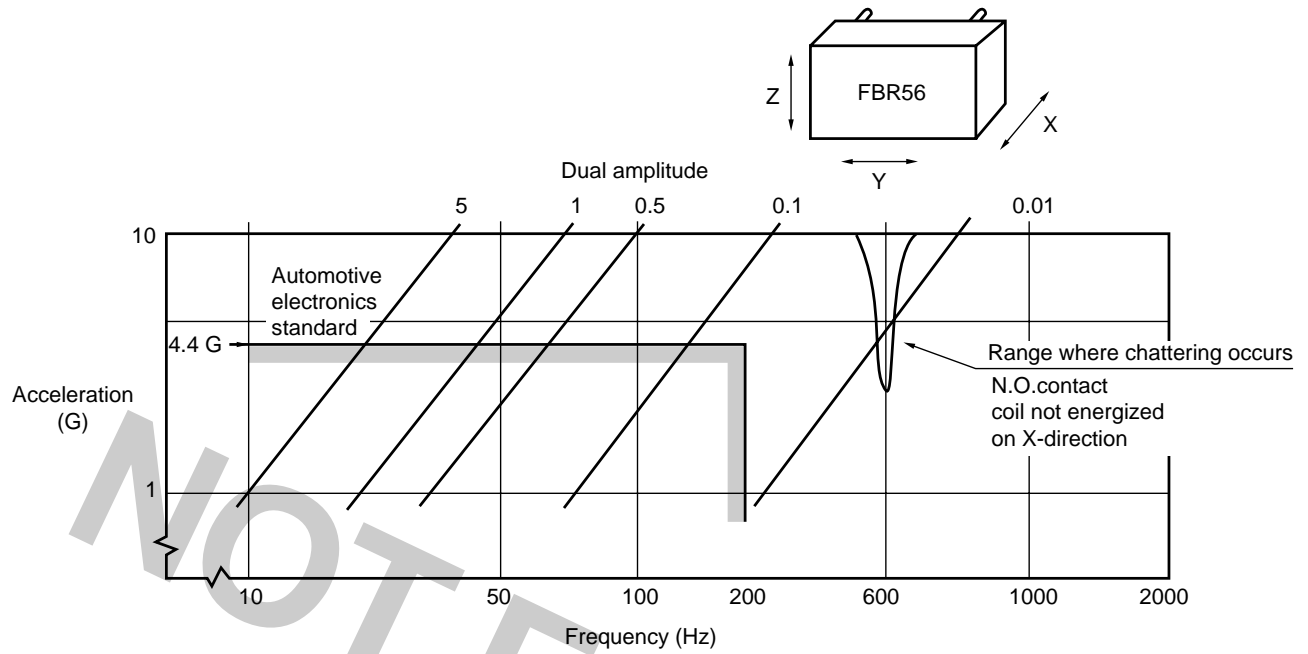


5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

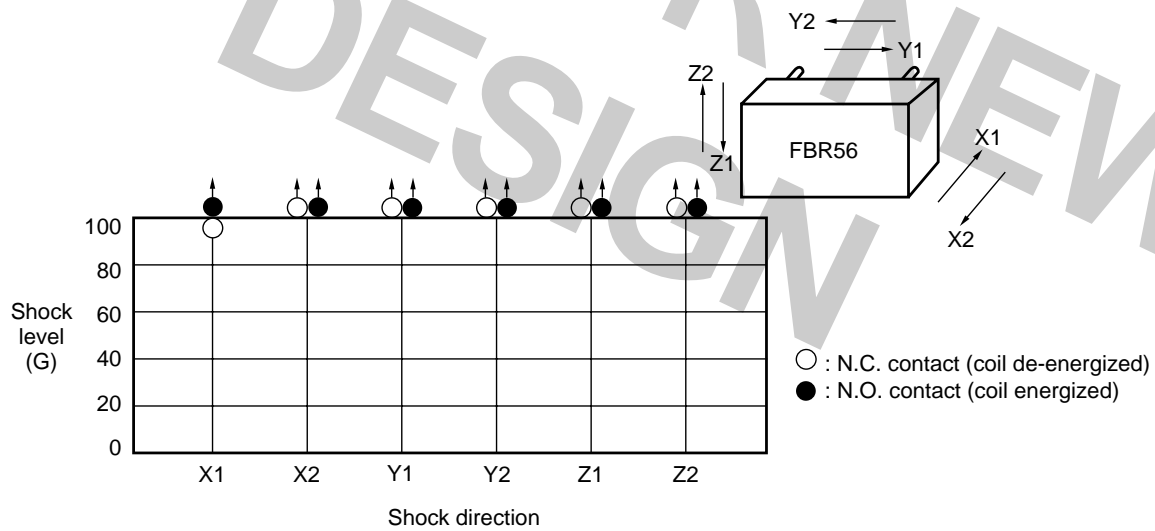


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6. VIBRATION RESISTANCE CHARACTERISTICS

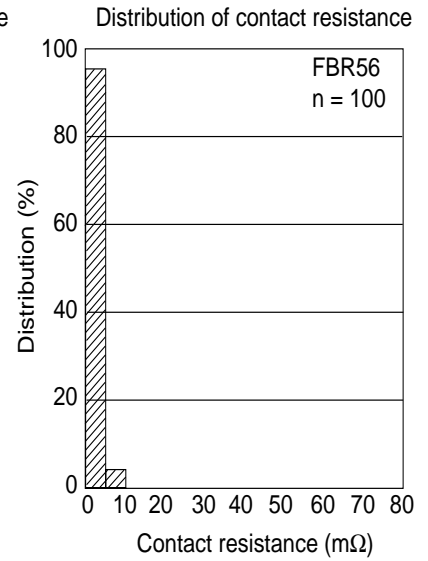
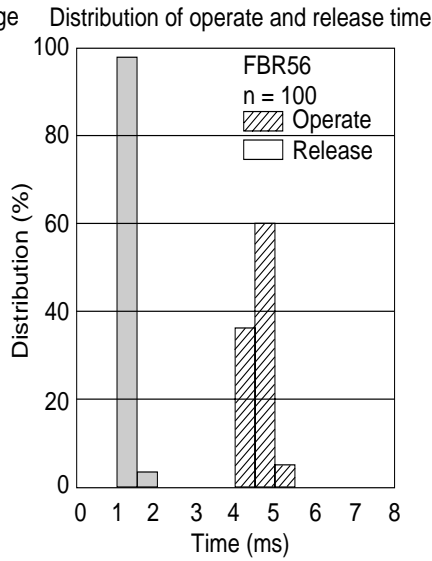
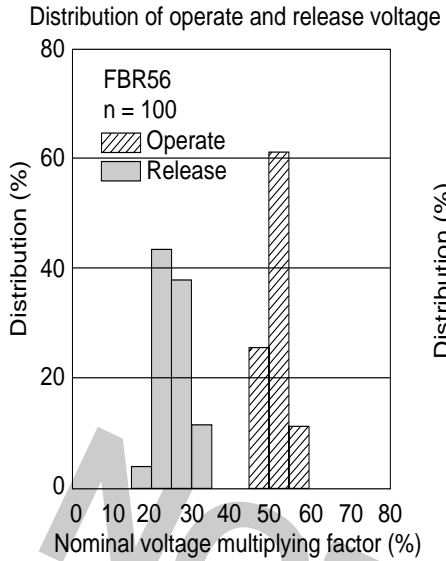


7. SHOCK RESISTANCE CHARACTERISTICS



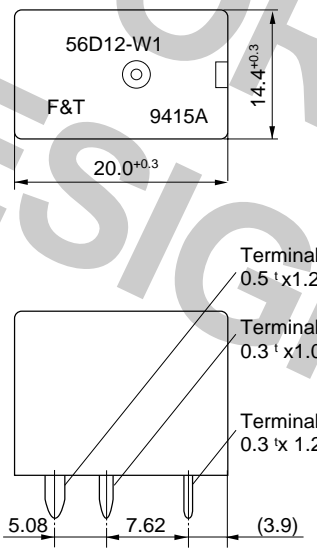
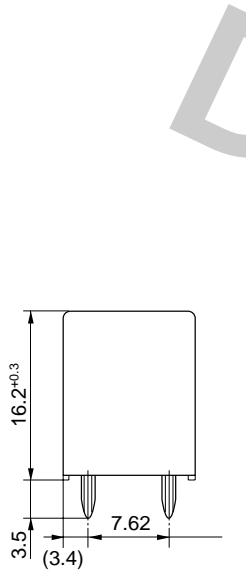
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REFERENCE DATA

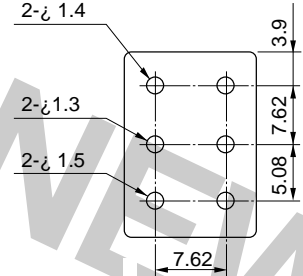


DIMENSIONS

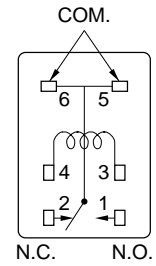
Dimensions



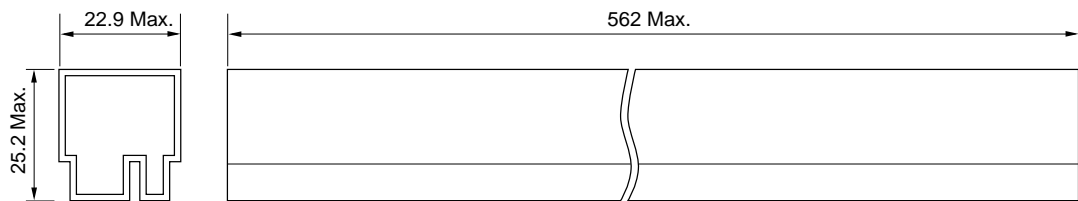
PC board mounting hole layout (BOTTOM VIEW)



Schematics (BOTTOM VIEW)



Tube carrier



35 pcs/tube

Unit : mm

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