

COMPACT HIGH POWER RELAY

1 POLE - 30A (28VDC)

For 24V battery automotive applications

FBR57 Series

RoHS Compliant

■ FEATURES

- High power contact capacity
(carrying current: 40A/10 minutes, 30A/1 hour)
- Suitable for controlling 24V motors in trucks and other large vehicles
- High heat resistance and extended operating voltage
- Contact gap 0.8mm
- RoHS compliant



■ APPLICATIONS

Silver tin oxide contact (-Y): Door lock for truck, bus etc.

Silver tin oxide indium contact (-W1): Wiper for truck, bus etc.

■ PART NUMBERS

[Example] FBR57 N D24 - W1 - **
 (a) (b) (c) (d) (e)

(a)	Relay type	FBR57 series
(b)	Enclosure	N : Plastic sealed type
(c)	Coil rated voltage	D24 : 24VDC Please refer to coil rating table
(d)	Contact material	W1 : Silver tin oxide indium Y : Silver tin oxide
(e)	Special type	To be assigned custom specification

Actual marking does not carry the type name: "FBR"

E.g.: Ordering code: FBR57ND24-W1 Actual marking: 57ND24-W1

■ SPECIFICATIONS

Item		Specifications	Remarks/Conditions	
Contact Data	Configuration	1c (1 Form C)		
	Material	Silver tin oxide indium (-W1 type) Silver tin oxide (-Y type)		
	Voltage drop	Max. 100mV	At 1A, 12VDC	
	Contact rating	28VDC, 12A (locked motor load) 28VDC, inrush 15A, break 2.5A (motor free load)		
	Max. carrying current	40A/10 minutes, 30A/1 hour (25°C, 100% rated coil voltage)		
	Max. inrush current	70A	Reference	
	Max. switching voltage	28VDC	Reference	
	Max. switching current	12A	Reference	
	Min. switching load ^{*1}	1A, 6VDC		
Coil data	Operating temperature range	-40°C to +85°C	No frost	
	Storage temperature range	-40°C to +100°C	No frost	
Time	Operate (at nominal voltage)	Max. 10ms	Without bounce	
	Release (at nominal voltage)	Max. 5ms	Without bounce	
Life	Mechanical	Min. 10 x 10 ⁶ operations		
	Electrical (resistive)	Min. 100 x 10 ³ operations (locked motor load) Min. 500 x 10 ³ operations (motor free load)		
Others	Vibration resistance	Misoperation	10 to 200Hz, acceleration 44m/s ² (4.5G), constant acceleration	Coil ON/OFF, 3 axis, total 6 cycles
		Endurance	10 to 200Hz, acceleration 44m/s ² (4.5G), constant acceleration	Coil OFF, 3 axis, total 6 hours
	Shock resistance	Misoperation	100m/s ²	Coil ON/OFF, 3 axis, total 36 operations
		Endurance	1,000m/s ²	Coil OFF, 3 axis, total 18 operations
	Dimensions / Weight		14.4 x 20.0 x 16.2mm / Approximately 9.4 g	

*1: Minimum switching loads mentioned above are reference values. Please perform the confirmation test with actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

! Care shall be taken on the heat generated on PC board when maximum carrying current exceeds 10A. Please perform the confirmation test with actual conditions.. Please perform the confirmation test with actual load before production since reference values may vary according to switching frequencies, environmental conditions.

COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance $\pm 10\%$ (Ω)	Must Operate Voltage* ¹ (VDC)	Must Release Voltage* ¹ (VDC)
D24	24	384	14.4 (at 20°C) 18 (at 85°C)	1.9 (at 20°C) 2.4 (at 85°C)

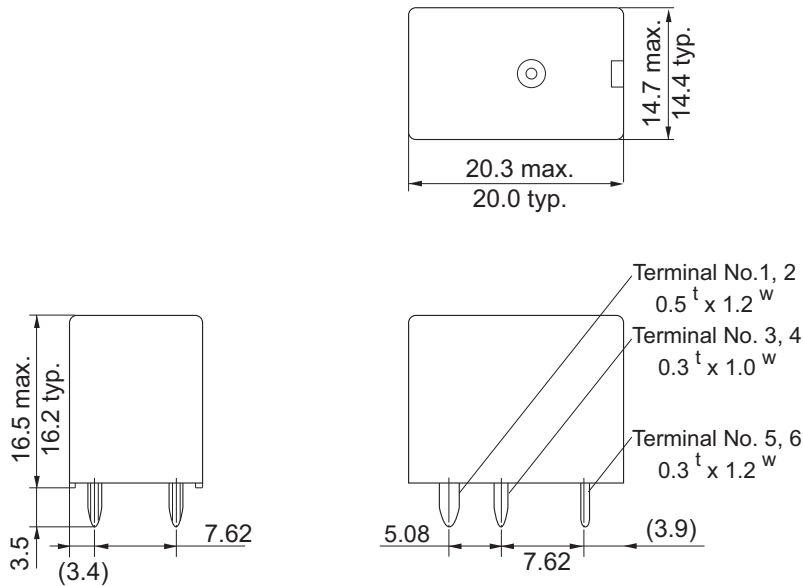
Note: All values in the table are valid at 20°C and zero contact current, unless otherwise specified.

Note: Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

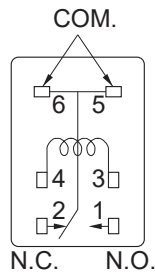
*1: Specified operated values are valid for pulse wave voltage.

DIMENSIONS

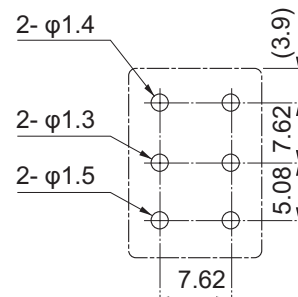
Dimensions



Schematics (BOTTOM VIEW)



PC board mounting hole layout (BOTTOM VIEW)



* Dimensions do not include tolerances. Please ask specification in case you need tolerances.

* Dimensions of the terminals do not include thickness of pre-soldering.

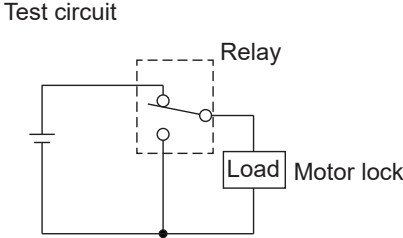
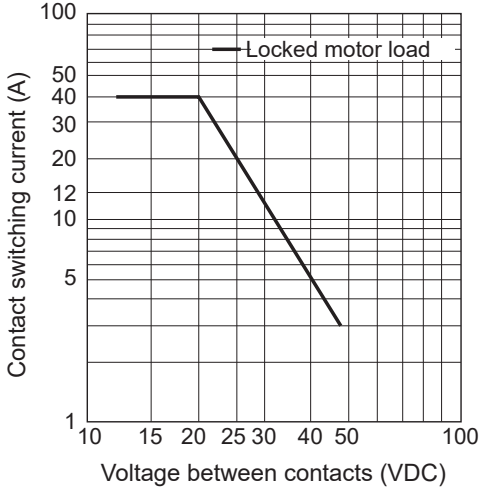
* Tolerance of PC board mounting hole layout : ± 0.1 unless otherwise specified.

(): Reference
Unit: mm

CHARACTERISTIC DATA

(Characteristic data is not guaranteed value but measured values of samples from production line.)

Maximum break capacity



Life test (example)

(1) Motor lock

Test item	Test circuit	Current wave form
12A, 28VDC Motor lock 100,000 operations minimum Contact material: Silver tin oxide indium		

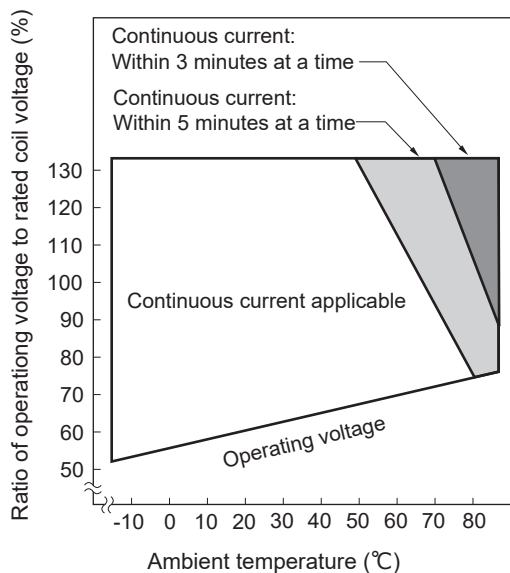
(2) Motor free

Test item	Test circuit	Current wave form
Inrush 15A, idle 2.5A, 28VDC Motor free 500,000 operations minimum Contact material: Silver tin oxide indium		

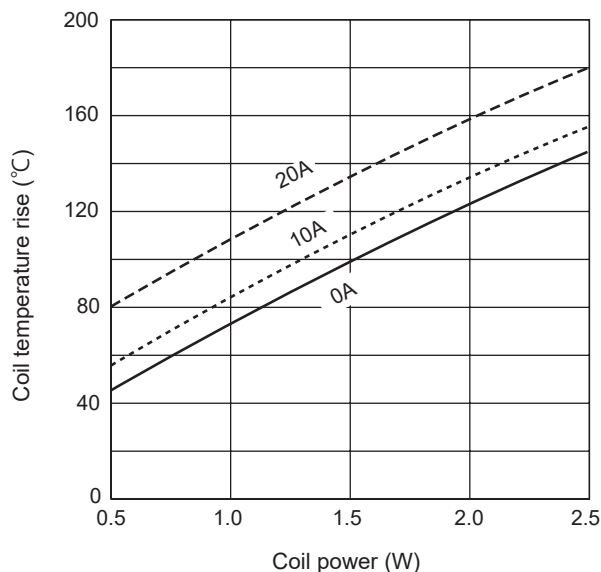
CHARACTERISTIC DATA

(Characteristic data is not guaranteed value but measured values of samples from production line.)

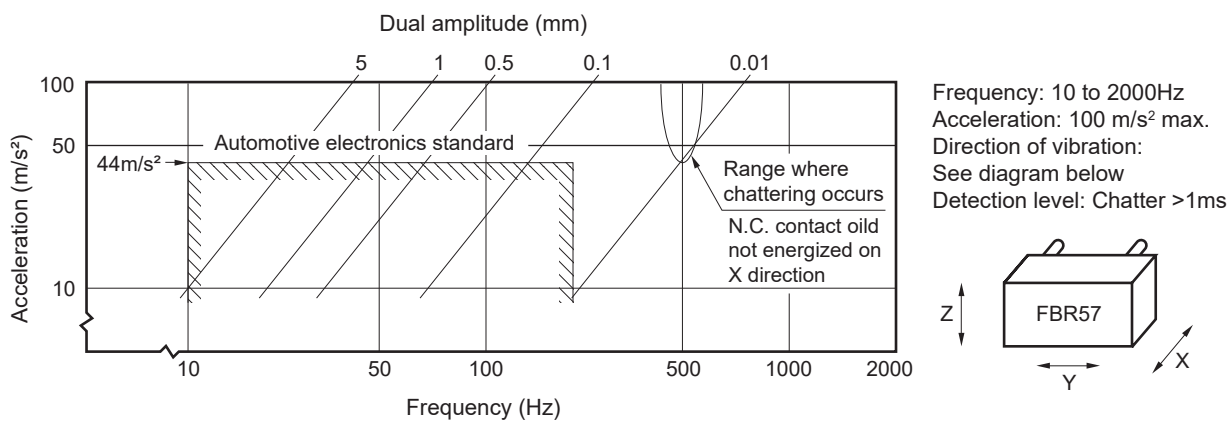
Operating range



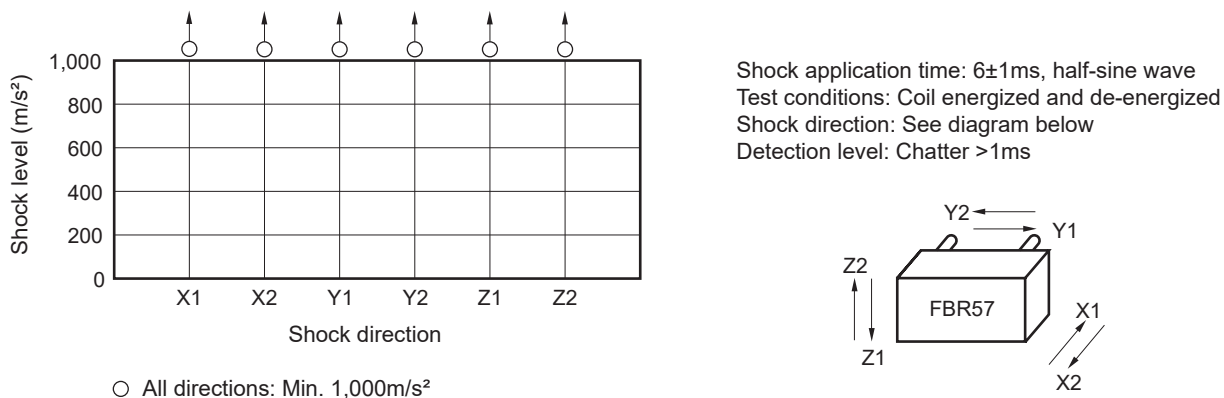
Coil temperature rise



Vibration resistance characteristics

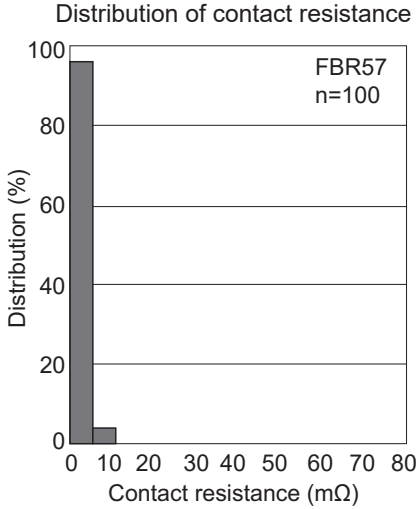
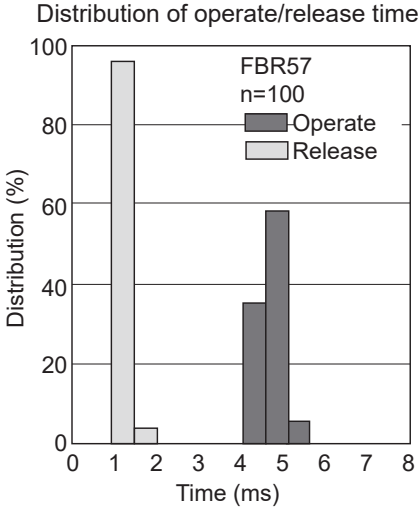
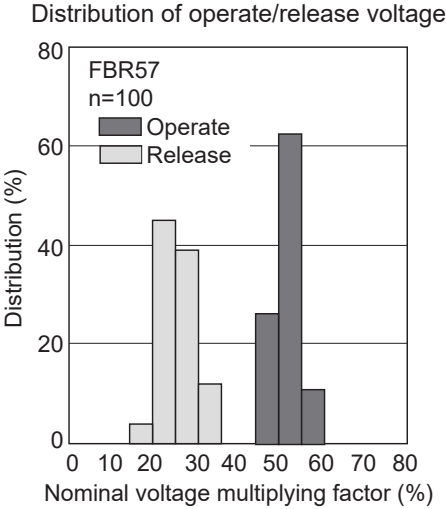


Shock resistance characteristics



■ CHARACTERISTIC DATA

(Characteristic data is not guaranteed value but measured values of samples from production line.)



CAUTIONS

- All values mentioned in this datasheet are provided under ideal conditions. Please perform the confirmation test before actual use.
- Reflow soldering is prohibited.
- Do not use relays in the atmosphere with sulfide gas, chloride gas or nitric oxide. Contact resistance may increase.
- Do not use silicon or silicon-containing product or materials near relays. It may cause contact failure.

GENERAL INFORMATION

1. ROHS Compliance

- All relays produced by FCL Components are compliant with RoHS directive 2011/65/EU, including commission delegated directive 2015/863.

2. Recommended lead free solder condition

- Lead free solder plating on relay terminals is Sn-3.0Ag-0.5Cu, unless otherwise specified. This material has been verified to be compatible with PbSn assembly process.
- Recommended solder for assembly: Sn-3.0Ag-0.5Cu.

Flow Solder Condition:

Pre-Heating: Maximum 120°C within 90 sec.

Soldering: Dip within 5 sec. at 255°C±5°C solder bath

Relay must be cooled by air immediately after soldering

Solder by Soldering Iron:

Soldering Iron: 30-60W

Temperature: Maximum 340-360°C

Duration: Maximum 3 sec.

We highly recommend that you confirm your actual solder conditions

3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to electromechanical relays, unless otherwise indicated.

4. Tin Whiskers

- Dipped SnAgCu solder is known as presenting a low risk to tin whisker development. No considerable length whisker was found by our in-house test.

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