

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 ±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)

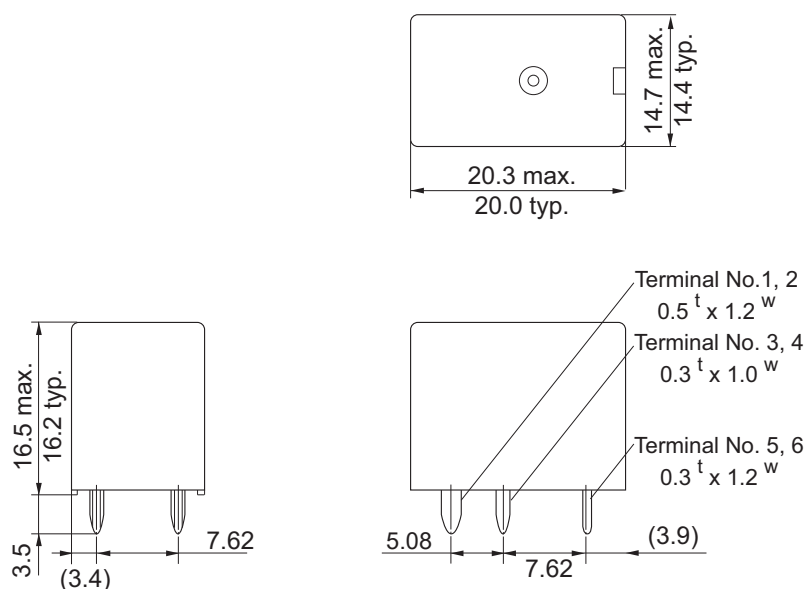
Note: All values in the table are valid at 20°C and zero contact current, unless otherwise specified.

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

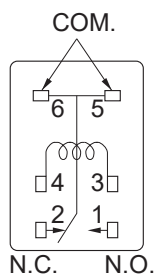
*1: Specified operated values are valid for pulse wave voltage.

■ DIMENSIONS

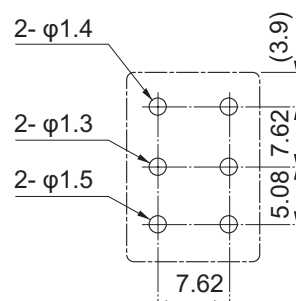
● Dimensions



● 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.

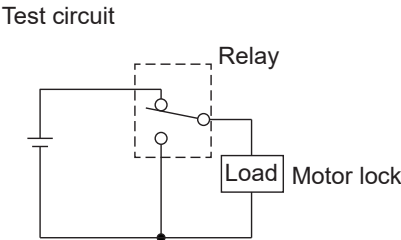
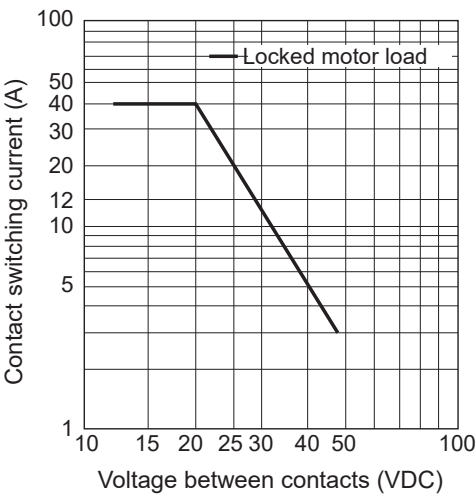
* Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.

(): 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		

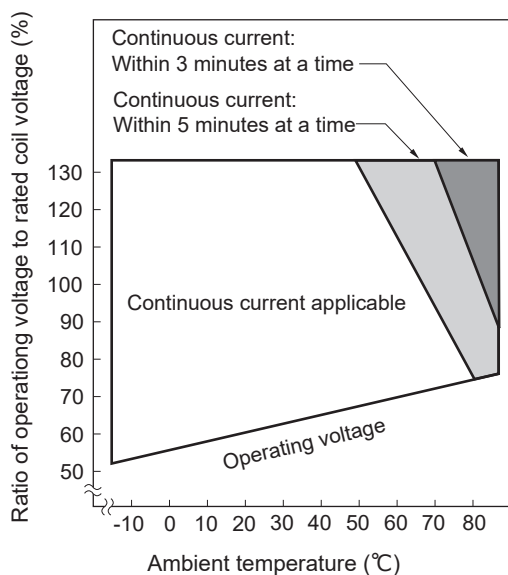
(2) Motor free

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		

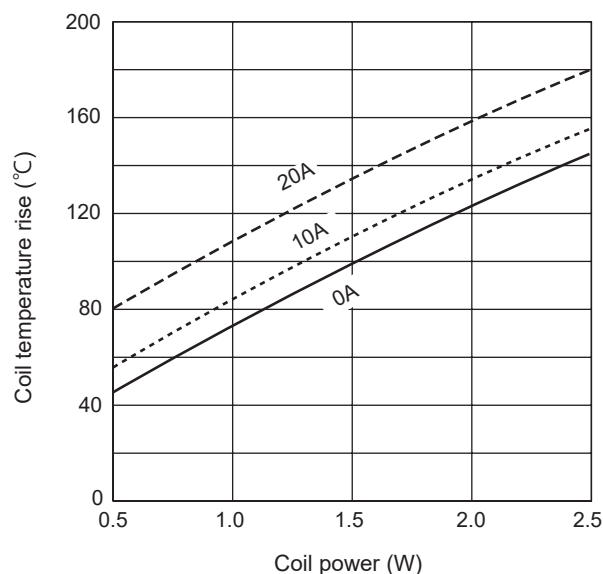
CHARACTERISTIC DATA

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

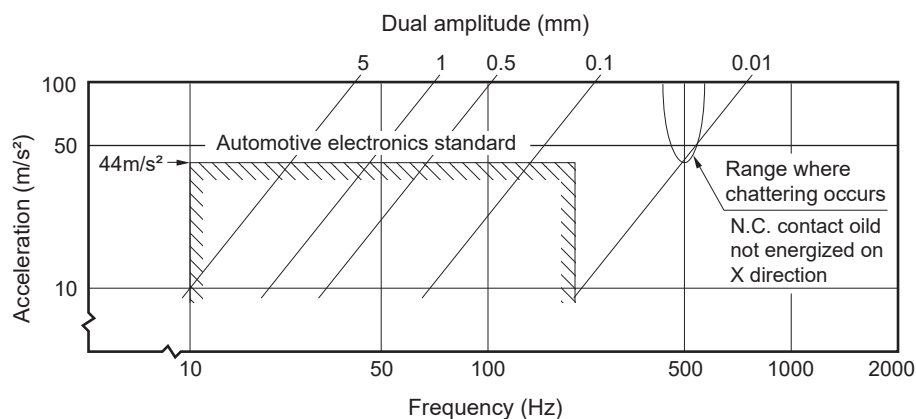
Operating range



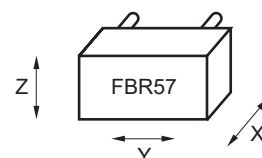
Coil temperature rise



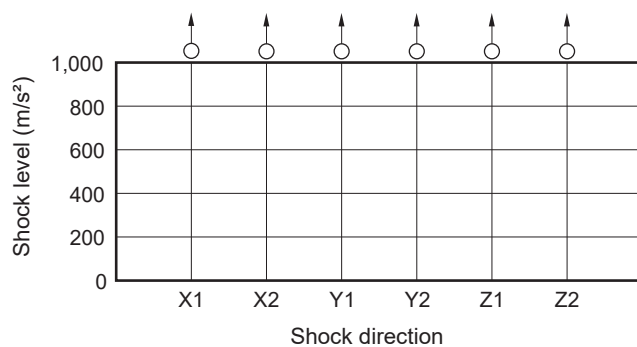
Vibration resistance characteristics



Frequency: 10 to 2000Hz
Acceleration: 100 m/s² max.
Direction of vibration:
See diagram below
Detection level: Chatter >1ms

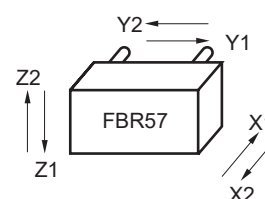


Shock resistance characteristics



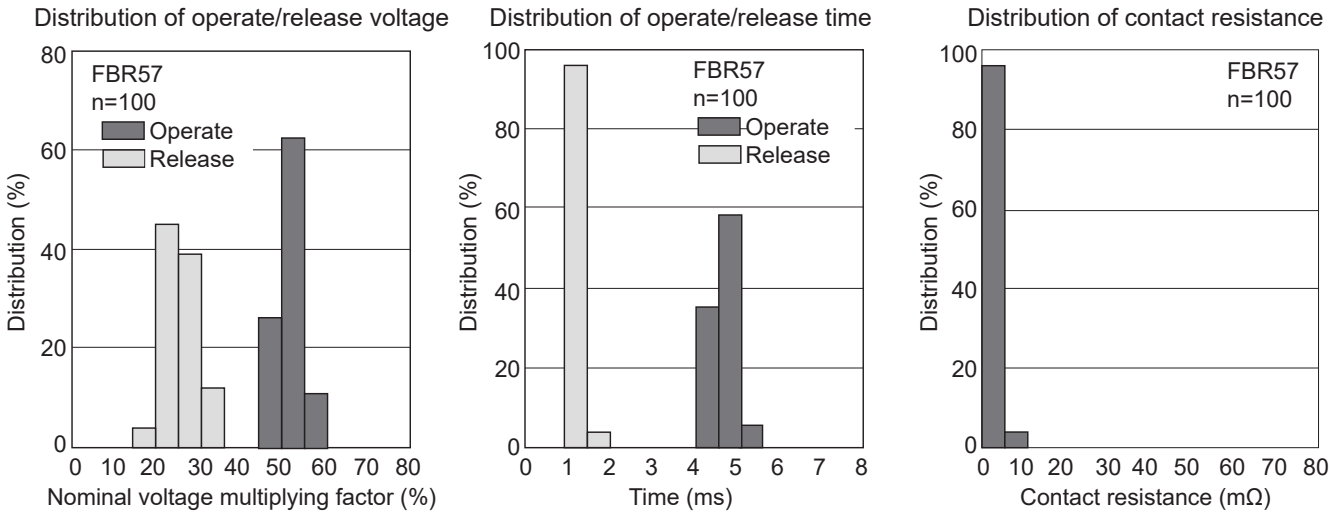
○ All directions: Min. 1,000m/s²

Shock application time: 6±1ms, half-sine wave
Test conditions: Coil energized and de-energized
Shock direction: See diagram below
Detection level: Chatter >1ms



■ 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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