COMPACT POWER RELAY

1 POLE—20 A (FOR AUTOMOTIVE FLASHER LAMP LOAD APPLICATIONS)

FBR51(–WF) SERIES

■ FEATURES

- Relay for flasher lamp load (automotive application) newly added to our compact power relay, FBR51 Series.
- Long life
  Special contact allows more than 250k operations at flasher lamp load of 14 V DC, 11 A inrush, rated 80 W.

■ ORDERING INFORMATION

[Example] FBR51 (a) N (b) D12 (c) – WF (d) –** (e)

(a)	Series Name	FBR51 : FBR51 Series (contact gap 0.3 mm)
(b)	Structure	N : Plastic sealed type
(c)	Nominal Voltage	D09 : 9 VDC D10 : 10 VDC D12 : 12 VDC
(d)	Contact Material	WF : Special contact *
(e)	Custom Designation	To be assigned custom specification

* The contact materials of the movable and stationary contacts are different. Therefore, the specified load polarity must be observed to achieve rated life. Refer to life test examples and schematic.

■ SPECIFICATIONS

Item			FBR51 Series
Contact	Arrangement		1 form A
	Material		Special contact
	Voltage Drop (resistance)		Maximum 100 mV (at 2 A 12 VDC)
	Ratings		14 VDC–80 W (load: tungsten lamp)
	Maximum Carrying Current		30 A/ 1 hour (25°C, 100% rated coil voltage)
	Max. Inrush Current (reference)		80 A
	Max. Switching Current (reference)		35 A 16 VDC
	Min. Switching Load*1 (reference)		6 VDC, 1 A
Coil	Operating Temperature		–40°C to + 85°C (no frost)
	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		1×10^7 operations minimum
	Electrical		2.5 x 10^6 ops. 14 VDC inrush 11 A (0.35s ON, 0.35s OFF), 80 W (load: tungsten lamp)
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 6 g
	Polarity		N.O. Terminal: (+)side COM. Terminal: (–)side

*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

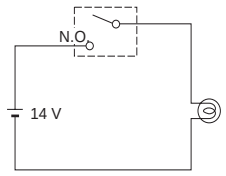
MODEL FBR51 Series	Nominal voltage	Coil resistance (±10%) (at 20°C)	Must operate voltage	Thermal resistance
FBR51ND09-WF	9 VDC	135 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	73°C/W
FBR51ND10-WF	10 VDC	180 Ω	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR51ND12-WF	12 VDC	240 Ω	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

■ CHARACTERISTIC DATA

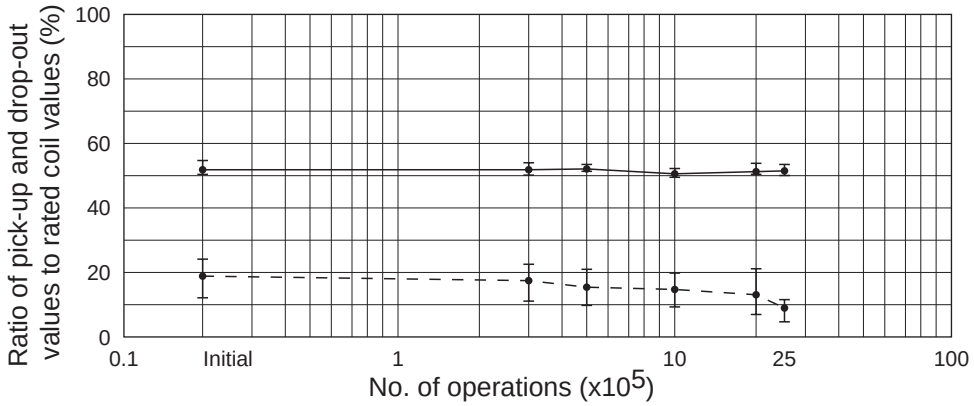
1. LIFE TEST (EXAMPLES)

Test Item
DC 14V-11A (80W)
Flasher Hazard lamp load
2,500,000 operations minimum
(FBR-51□ WF type)

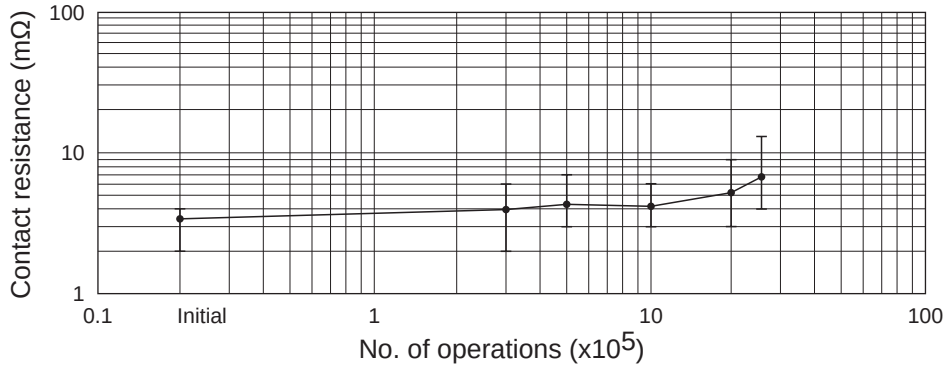
Test circuit



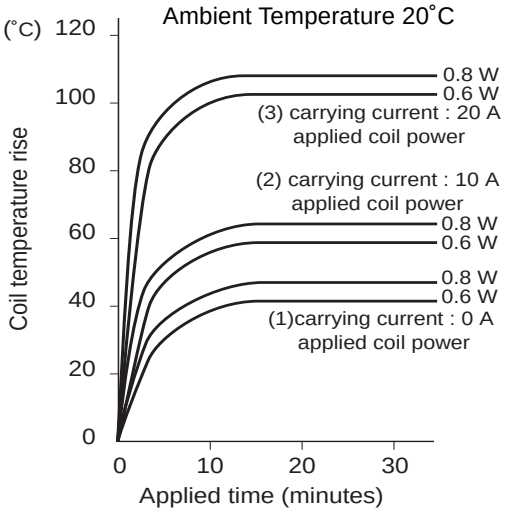
Circuit wave form



measured at 6V, 1A wet

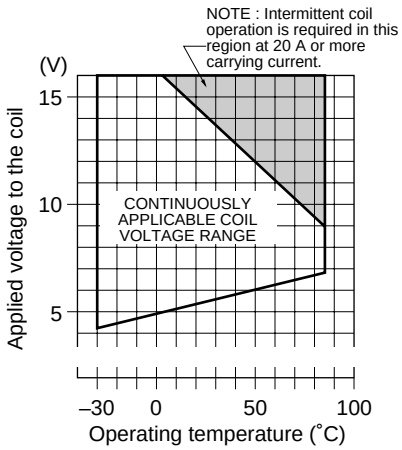


2. COIL TEMPERATURE RISE

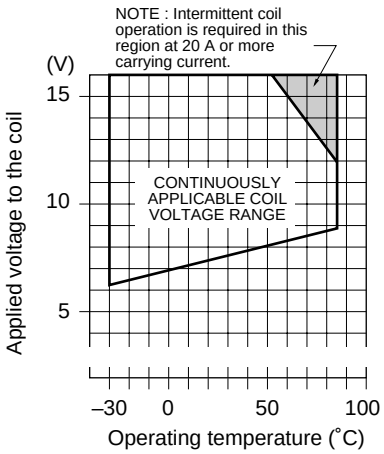


3. OPERATING COIL VOLATGE RANGE (EXAMPLE)

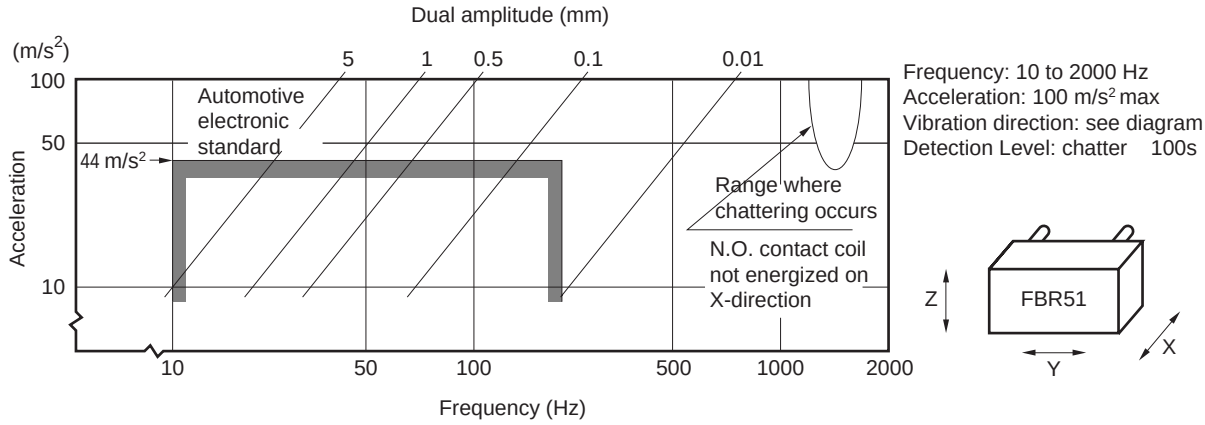
[FBR51ND09-WF]



[FBR51ND12-WF]

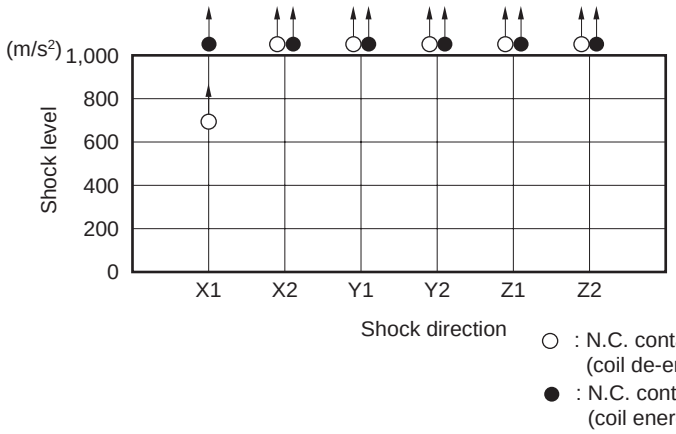


4. VIBRATION RESISTANCE CHARACTERISTICS

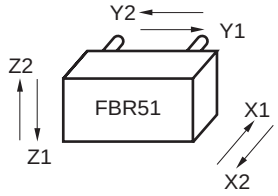


Frequency: 10 to 2000 Hz
Acceleration: 100 m/s² max
Vibration direction: see diagram
Detection Level: chatter 100s

5. SHOCK RESISTANCE CHARACTERISTICS

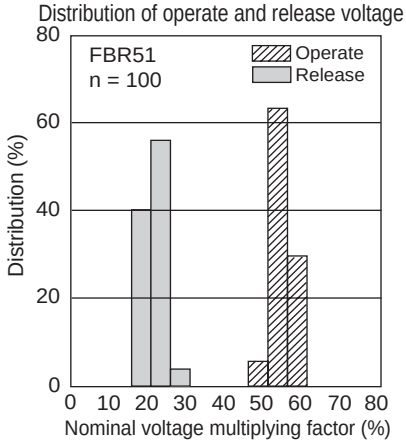


Shock application time : 11 ms, half-sine wave
Test material : coil, energized and de-energized
Shock direction: see diagram
Detection Level : chatter ≥ 100 µs

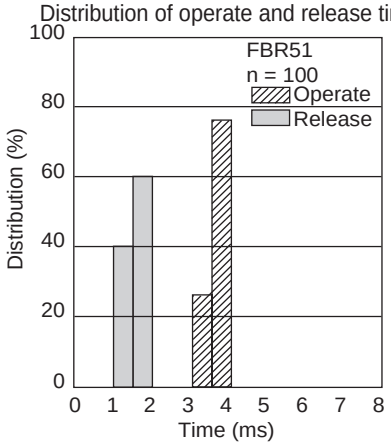


■ REFERENCE DATA

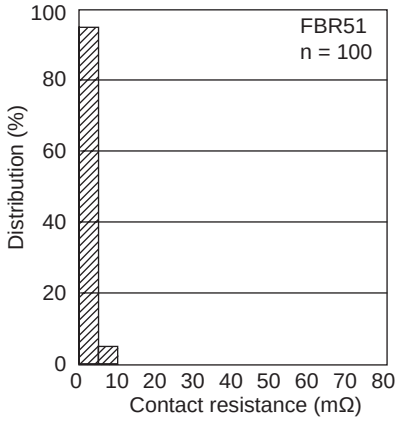
Distribution of operate and release voltage



Distribution of operate and release time

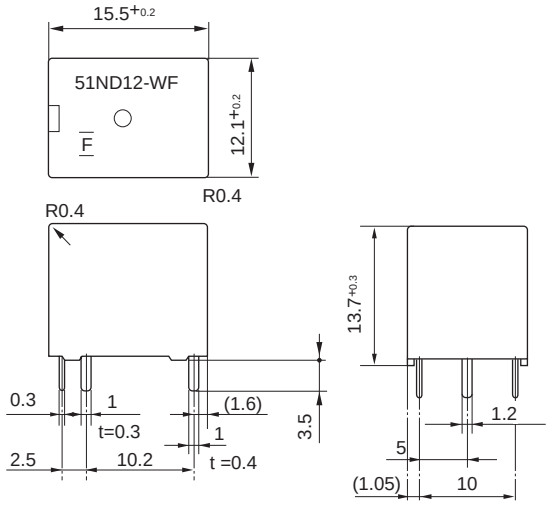


Distribution of contact resistance

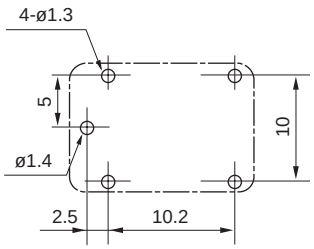


■ DIMENSIONS

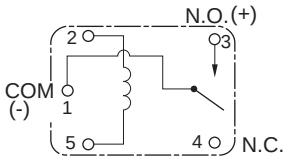
● Dimensions



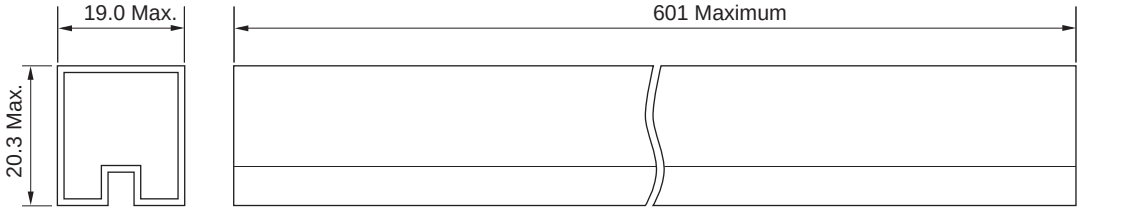
● PC board mounting hole layout
BOTTOM VIEW



● Schematics
BOTTOM VIEW
FBR50-WF



● Tube carrier



45 pieces/tube

Unit : mm

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