

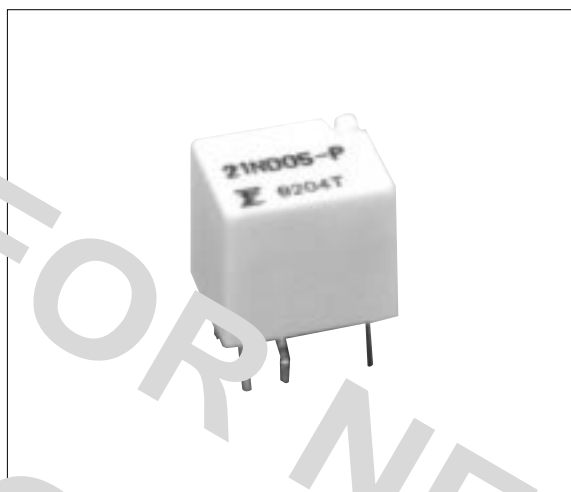
# MINIATURE RELAY

## 1 POLE—1 to 2 A (FOR SIGNAL SWITCHING)

### FBR20 SERIES

#### ■ FEATURES

- Microminiature size  
Two FBR20 Series relays can be mounted in the space required for a single FBR210 Series relay.
- 2 A carrying current
- Strong shock resistance  
Even with 500 m/s<sup>2</sup> shock, FBR20 Series relays never miss an operation.
- Easy pattern design  
Separate location of drive (coil) and output (contact) terminals allows easy PC board pattern design.
- Formed terminals for temporary mounting  
The uniquely designed terminals allow FBR20 Series relays to be mounted temporarily on PC boards.
- Conforms to FCC68.302 (high dielectric strength type)
- UL recognized (File No. E63615)
- Tube packaging



#### ■ ORDERING INFORMATION

[Example]      FBR21   N   D12   U   —   05   (02)  
                         (a)   (b)   (c)   (d)   (e)   (f)

(a)	Series Name (Contact Style)	FBR21: FBR20 Series (single contact) FBR22: FBR20 Series (bifurcated contact)
(b)	Enclosure	Nil: Flux free type N: Plastic sealed type
(c)	Nominal Voltage	(Example) D03: 3 VDC D05: 5 VDC D12: 12 VDC (refer to the COIL DATA CHART)
(d)	UL Standard	Nil: Standard U: UL114 recognized
(e)	Contact Material	P: Gold-overlay over palladium
(f)	Special Type	Nil: Standard 02: High dielectric strength type (100 VAC)

Note: The designation name is stamped on the top of the relay case as follows:  
(Example) Designation ordered: FBR21D05-P  
Stamp: 21D05-P

## ■ SAFETY STANDARD AND FILE NUMBERS

UL114 (File No. E63615)

Nominal voltage	Contact rating
1.5 to 24 VDC	1 A 24 VDC resistive 0.5 A 30 VAC resistive

## ■ SPECIFICATIONS

Item		Single contact type	Bifurcated contact type
Contact	Arrangement	1 form C (SPDT)	
	Material	Gold-overlay silver-palladium	
	Resistance (initial)	Maximum 100 mΩ (at 0.1 A 6 VDC)	
	Rating (resistive)	0.5 A 120 VAC or 1 A 24 VDC (resistive load)	
	Maximum Carrying Current	2 A	
	Maximum Switching Power	60 VA or 24 W	
	Maximum Switching Voltage*1	125 V	
	Maximum Switching Current	1 A	
	Minimum Switching Load*2 (reference)	Plastic sealed 1 mA 1V Flux free 1 mA 5V	Plastic sealed 0.1V 100μA Flux free 1V, 1mA
	Capacitance (reference)	Approximately 2 pF (between coil and contacts) Approximately 1 pF (between open contacts)	
Coil	Nominal Power (at 20°C)	Approximately 0.3 W	
	Operate Power (at 20°C)	Approximately 0.192 W maximum	
	Operating Temperature	-30°C to +65°C (no frost) (refer to the CHARACTERISTIC DATA)	
	Operating Humidity	45 to 85%RH	
Time Value	Operate (at nominal voltage)	Maximum 5 ms	
	Release (at nominal voltage)	Maximum 2 ms	
Insulation	Resistance (initial)	Minimum 100 MΩ (at 500 VDC)	
	Dielectric Strength	Between coil and contacts	500 VAC for 1 minute (standard) 1,000 VAC for 1 minute (high dielectric strength type)
		Between open contacts	500 VAC 1 minute
	Surge Strength (high dielectric strength)	1,500 V (10 × 700 μs) (between coil and contacts)	
Life	Mechanical	5 × 10 <sup>6</sup> operations minimum	
	Electrical (refer to the REFERENCE DATA)	2 × 10 <sup>5</sup> operations minimum (at contact rating)	
Other	Vibration Resistance		10 to 55 Hz (double amplitude of 3.0 mm)
	Shock Resistance	Misoperation	500 m/s <sup>2</sup> (11±1 ms)
		Endurance	1,000 m/s <sup>2</sup> (11±1 ms)
	Weight		Approximately 1.7 g

\*1 If the switching voltage exceeds the rated contact voltage, reduce the current. The current values vary according to the type of load.

\*2 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 operation environment.

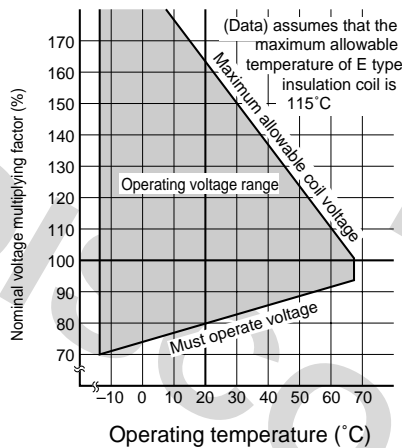
## COIL DATA CHART

MODEL				Nominal voltage	Coil resistance ±10%	Nominal current (at nominal voltage) approx.	Must operate voltage	Must release voltage	Maximum allowable voltage	Nominal power	Coil temperature rise
Single contact type		Bifurcated contact type									
Flux free	Plastic sealed	Flux free	Plastic sealed								
FBR21D01-P	FBR21ND01-P	FBR22D01-P	FBR22ND01-P	1.5 VDC	7.5 W	200 mA	80% max. of nominal voltage	5% min. of nominal voltage	160% of nominal voltage	Approx. 300 mW (at nominal voltage)	Approx. 45 deg (at nominal voltage)
FBR21D03-P	FBR21ND03-P	FBR22D03-P	FBR22ND03-P	3 VDC	30 W	100 mA					
FBR21D05-P	FBR21ND05-P	FBR22D05-P	FBR22ND05-P	5 VDC	83 W	60 mA					
FBR21D06-P	FBR21ND06-P	FBR22D06-P	FBR22ND06-P	6 VDC	120 W	50 mA					
FBR21D09-P	FBR21ND09-P	FBR22D09-P	FBR22ND09-P	9 VDC	270 W	33 mA					
FBR21D12-P	FBR21ND12-P	FBR22D12-P	FBR22ND12-P	12 VDC	480 W	25 mA					
FBR21D18-P	FBR21ND18-P	FBR22D18-P	FBR22ND18-P	18 VDC	1,080 W	17 mA					
FBR21D24-P	FBR21ND24-P	FBR22D24-P	FBR22ND24-P	24 VDC	1,920 W	12.5 mA					

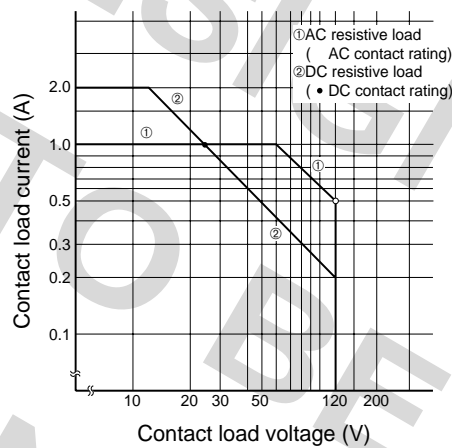
Note: All values in the table are measured at 20°C.

## CHARACTERISTIC DATA

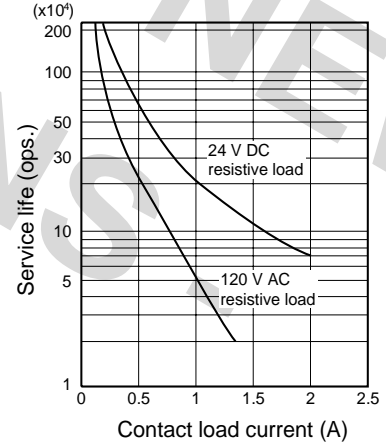
Range of operation temperature and voltage



Maximum switching capacity

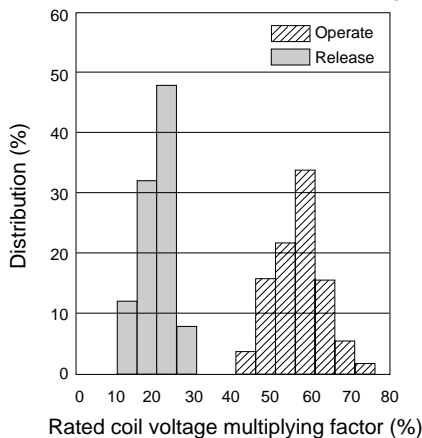


Life curve

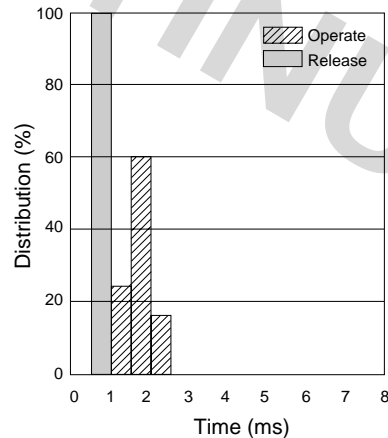


## REFERENCE DATA

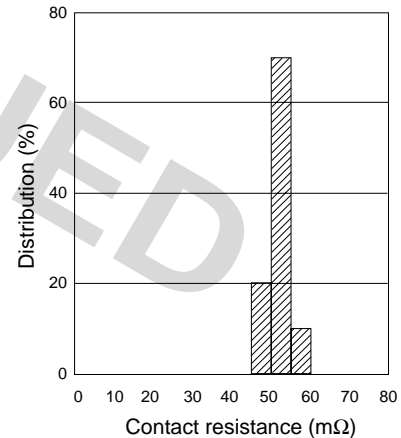
Distribution of operate and release voltage



Distribution of operate and release time



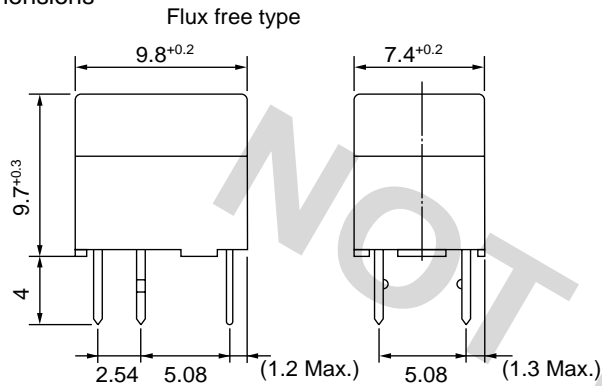
Distribution of contact resistance



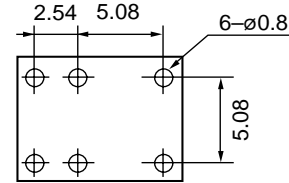
# FBR20 SERIES

## ■ DIMENSIONS

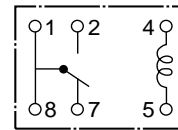
### ●Dimensions



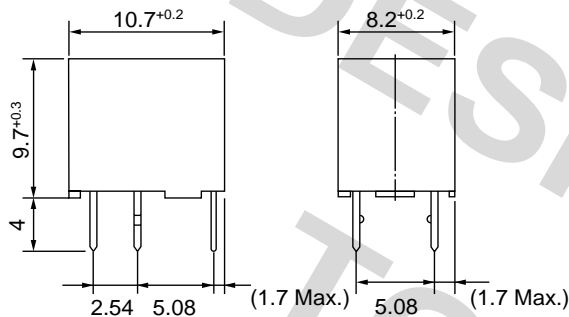
### ●PC board mounting hole layout (BOTTOM VIEW)



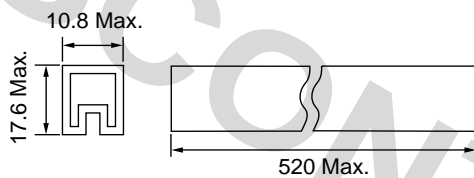
### ●Schematics (BOTTOM VIEW)



### Plastic sealed type



### ●Tube carrier



Flux free type:50pcs/Tube  
Plastic sealed type:40pcs/Tube

Unit: mm

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