

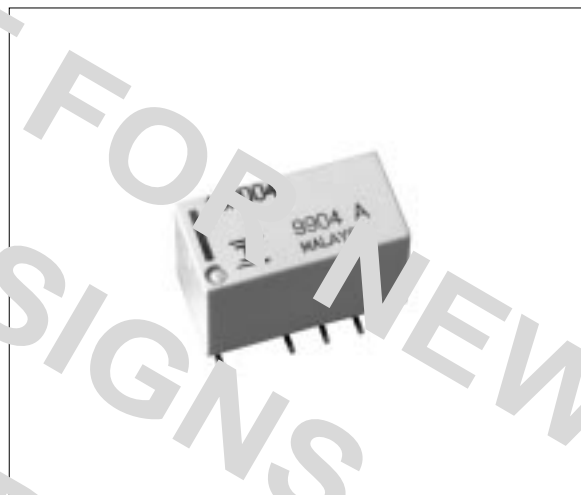
# MINIATURE RELAY (SURFACE MOUNT TYPE)

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

### FBR18 SERIES

#### ■ FEATURES

- 2 form C small size, surface mounting relay.
- Super miniature size: 0.2 inch × 0.1 inch grid, 12 pin DIP  
Up to 50% less volume and board area than previous generation telecom relay.
- UL, CSA recognized
- High dielectric and surge strength:  
2.5 KV surge (per Bellcore TA-NWT-001089)  
1.5 KV surge (per FCC Part 28)  
1,000 V rms, open contacts
- Low power consumption: 80 mW operate  
140 mW nominal
- Tape and reel packing for automatic mounting.



#### ■ ORDERING INFORMATION

[Example] FBR18 N D 12 -F -M -\*\* (-CSA) -□  
(a) (b) (c) (d) (e) (f) (g) (h) (i)

(a)	Series Name	FBR18 : FBR Series [2 pole double throw (2 form C)]
(b)	Enclosure	N : Plastic sealed (washable type)
(c)	Coil Type	D : DC coil
(d)	Nominal Voltage	Refer to the COIL DATA CHART
(e)	Contact Material	Nil : Gold-overlay silver-plated -F : Gold-overlay silver-palladium
(f)	Terminal	Nil : Standard -M : High density mounting
(g)	Custom Designation	To be assigned custom specification
(h)	CSA Standard	-CSA: UL114 + CSA recognized
(i)	Packing	Nil : Tape and reel (500 pieces/tape and reel)

Note: The designation name is stamped on the top of the relay case as follows:

(Example) designation ordered : FBR18ND05

Stamp : 18ND05

#### ■ SAFETY STANDARD AND FILE NUMBERS

UL508, 1950, 114 (File No. E63615)

C22.2 No. 0, No. 14 (File No. LR40304 or LR64026)

Nominal voltage	Contact rating
3 to 24 VDC	2 A 30 VDC resistive 0.3 A 110 VDC resistive 0.5 A 125 VAC resistive

## ■ SPECIFICATIONS

Item			Standard (Gold-overlay silver-nickel)	-P type (Gold-overlay silver-palladium)
Contact	Arrangement		2 form C (DPDT)	
	Material		Gold-overlay silver-nickel	Gold-overlay silver-palladium
	Style		Bifurcated	
	Resistance (initial)		Maximum 100 mΩ (at 0.1 A 6 VDC)	
	Rating (resistive)		0.5 A 125 VAC or 1 A 30 VDC	
	Maximum Carrying Current		2 A (at 20°C)	
	Maximum Switching Power		62.5 VA or 60 W	
	Max. Switching Voltage*1		250 VAC or 220 VDC	
	Maximum Switching Current		2 A	
	Minimum Switching Load*2		0.01 mA 10 mVDC (reference)	
	Capacitance (at 10 kHz)		Approximately 1.0 pF (between open contacts, adjacent contacts ) Approximately 1.0 pF (between coil and contacts)	
Coil	Nominal Power (at 20°C)		Approximately 0.14 W (0.2 W for 24 V coil)	
	Operate Power (at 20°C)		Maximum 0.08 W (0.112 W for 24 V coil)	
	Thermal Resistance at Continuous Thermal Load		Approximately 115°C/W	
	Operating Temperature		−40°C to +85°C (no frost) (refer to the CHARACTERISTIC DATA)	
	Operating Humidity		45 to 85%RH	
Time Value	Operate (at nominal voltage)		Maximum 4 msec.	
	Release (at nominal voltage)		Maximum 4 msec.	
	Max. Switching Frequency		Mechanical 3 Hz or electrical 0.5 Hz (at contact rating)	
Insulation	Resistance (initial)		Minimum 1,000 MΩ (at 500 VDC)	
	Dielectric Strength	between open contacts	1,000 VAC 1 minimum	
		adjacent contacts		
		between coil and contacts		
	Surge Strength	between open contacts, adjacent contact	1,500 V (at 10 × 700 μs)	
		between coil and contacts	2,500 V (at 2 × 10 μs)	
Life	Mechanical		1 × 10 <sup>8</sup> operations minimum	
	Electrical (at contact rating)	DC	2 × 10 <sup>5</sup> operations minimum	5 × 10 <sup>5</sup> operations minimum
		AC	1 × 10 <sup>5</sup> operations minimum	2 × 10 <sup>5</sup> operations minimum
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 1.5 mm)	
		Endurance	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 1.9 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 atmosphere. The minimum switching load varies with the switching frequency and operation environment.

# FBR18 SERIES

## COIL DATA CHART

FBR-18 N type

MODEL		Nominal voltage	Coil resistance ( $\pm 10\%$ )	Nominal current (at nominal voltage) approx.	Must operate voltage*1	Must release voltage*1	Nominal power	Operate power	Coil temperature rise
Standard	-P type								
FBR18ND03	FBR18ND03-P	3 VDC	64.3 $\Omega$	46 mA	75% max. of nominal voltage	10% min. of nominal voltage	Approx. 0.14 W (at nominal voltage)	Approx. 0.08 W Max.	Approx. 20 deg (at nominal voltage)
FBR18ND04	FBR18ND04-P	4.5 VDC	145 $\Omega$	31 mA					
FBR18ND05	FBR18ND05-P	5 VDC	178 $\Omega$	28 mA					
FBR18ND06	FBR18ND06-P	6 VDC	257 $\Omega$	23 mA					
FBR18ND09	FBR18ND09-P	9 VDC	579 $\Omega$	15 mA					
FBR18ND12	FBR18ND12-P	12 VDC	1,028 $\Omega$	11 mA			0.2 W	0.112 W	30 deg
FBR18ND24	FBR18ND24-P	24 VDC	2,880 $\Omega$	8 mA					

\*1: Specified values are subject to pulse wave voltage.

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

FBR-18 W type

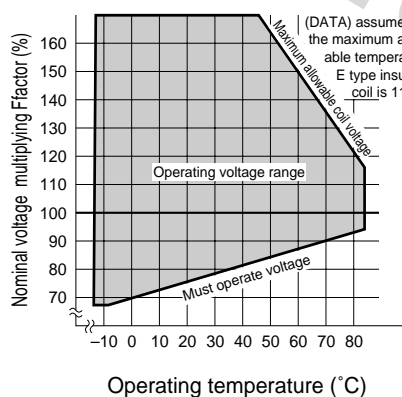
MODEL		Nominal voltage	Coil resistance ( $\pm 10\%$ )	Must operate voltage*1	Must release voltage*1	Nominal power	Operate power	Coil temperature rise
Standard	-P type							
FBR18WD03	FBR18WD03-P	3 VDC	39 $\Omega$	75% max. of nominal voltage	10% min. of nominal voltage	Approx. 0.23 W (at nominal voltage)	Approx. 0.13 W Max.	Approx. 30 deg (at nominal voltage)
FBR18WD04	FBR18WD04-P	4.5 VDC	88 $\Omega$					
FBR18WD05	FBR18WD05-P	5 VDC	108 $\Omega$					
FBR18WD06	FBR18WD06-P	6 VDC	156 $\Omega$					
FBR18WD09	FBR18WD09-P	9 VDC	352 $\Omega$					
FBR18WD12	FBR18WD12-P	12 VDC	626 $\Omega$			0.25 W	0.14W	33 deg
FBR18WD24	FBR18WD24-P	24 VDC	2,304 $\Omega$					

\*1: Specified values are subject to pulse wave voltage.

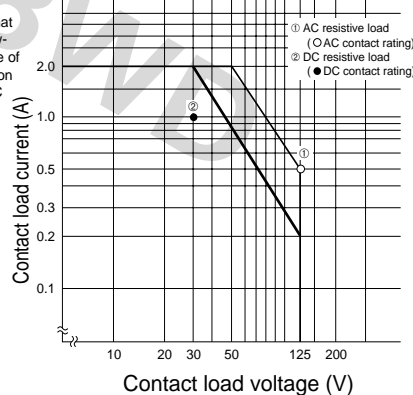
Note: All values in the table are measured at 20°C.

## CHARACTERISTIC DATA

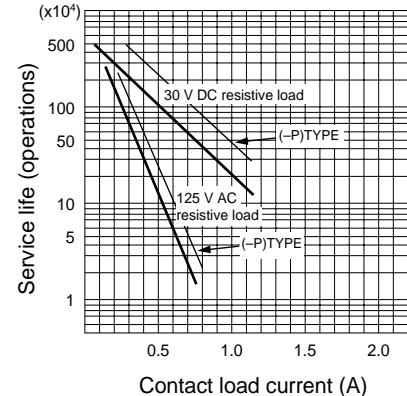
Range of operation temperature and voltage



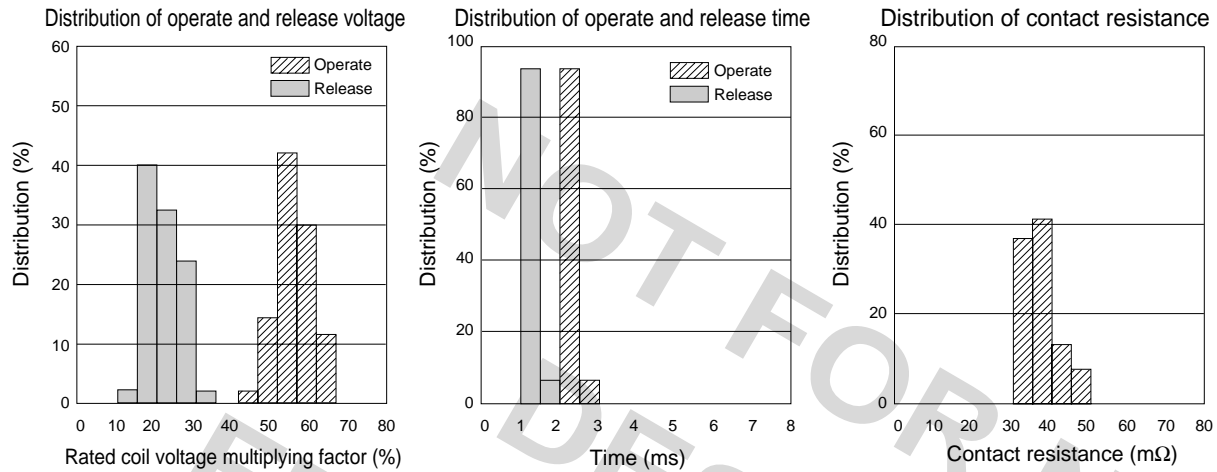
Maximum switching capacity



Life curve



## REFERENCE DATA



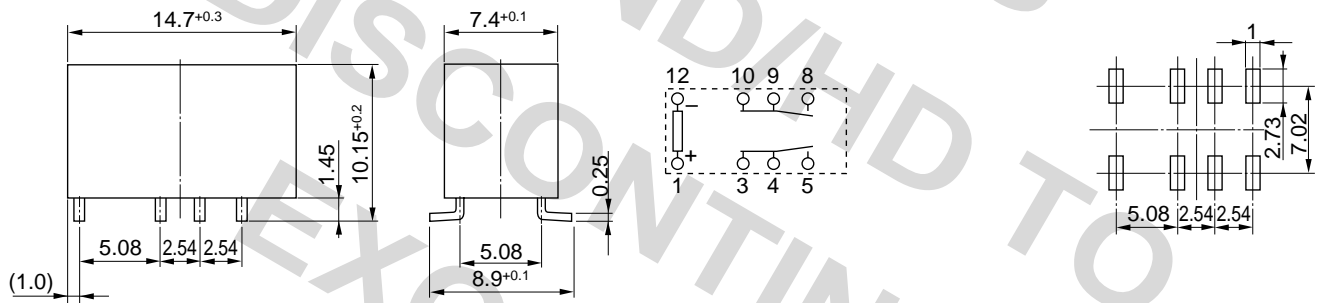
## DIMENSIONS

● Dimensions

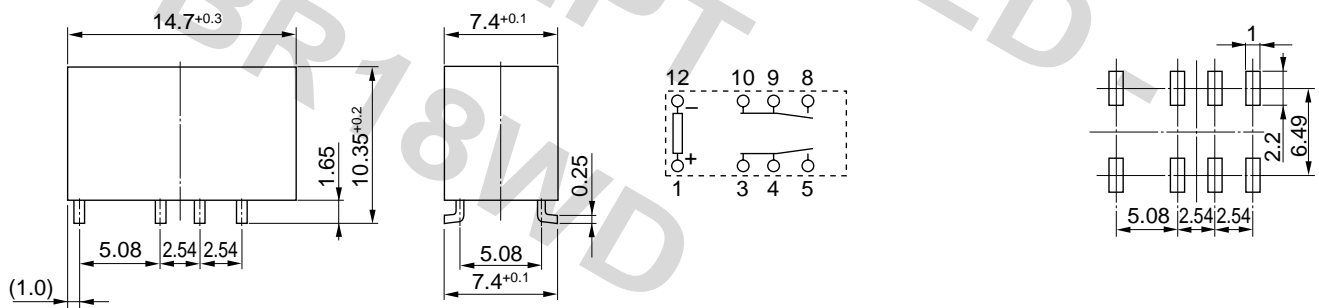
● Schematics  
(TOP VIEW)

● PC board mounting pad layout  
(TOP VIEW)

Standard (FBR18 type)



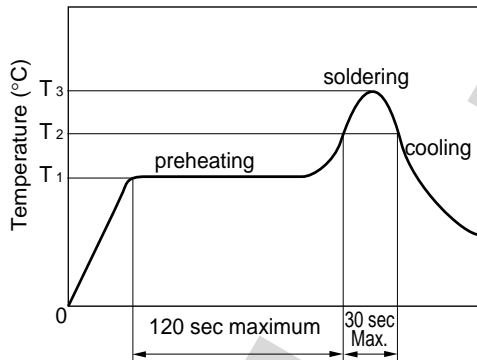
High density mounting (FBR18-M type)



Unit: mm

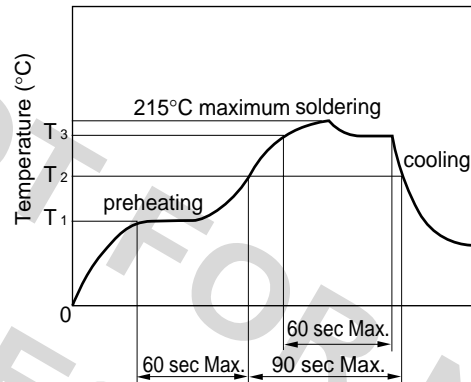
## RECOMMENDED SOLDERING CONDITIONS (TEMPERATURE PROFILE)

IRS (Infrared Reflow Soldering)



$T_3 = 245^{\circ}\text{C max.}$   
 $T_2 = 200^{\circ}\text{C max.}$   
 $T_1 = 165^{\circ}\text{C max.}$

VPS (Vapor Phase Soldering)



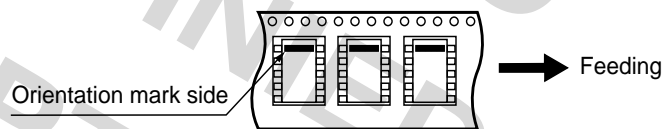
$T_3 = 200^{\circ}\text{C maximum}$   
 $T_2 = 165^{\circ}\text{C maximum}$   
 $T_1 = 100^{\circ}\text{C maximum}$

Note: 1. Temperature profiles show the temperature of PC board surface.  
 2. Please perform soldering test with your actual PC board before mass production, since the temperatures of PC board surfaces vary according to the size of PC board, status of parts mounting and heating method.

## PACKING

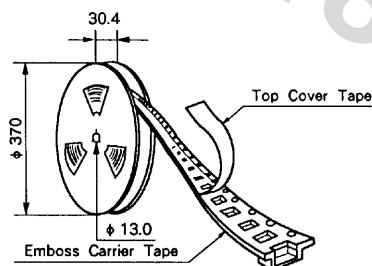
(1) Quantity of 1 reel : 500 pieces

• Packing orientation code: B

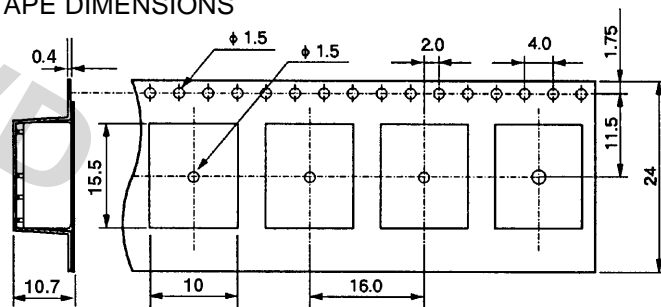


(2) Dimensions (in mm)

### REEL DIMENSIONS



### TAPE DIMENSIONS



Note: Relays are sold in packs of 500 pieces, please order 500 pieces as 1 unit.

## **Fujitsu Components International Headquarter Offices**

### **Japan**

Fujitsu Component Limited  
Gotanda-Chuo Building  
3-5, Higashigotanda 2-chome, Shinagawa-ku  
Tokyo 141, Japan  
Tel: (81-3) 5449-7010  
Fax: (81-3) 5449-2626  
Email: [promothq@ft.ed.fujitsu.com](mailto:promothq@ft.ed.fujitsu.com)  
Web: [www.fcl.fujitsu.com](http://www.fcl.fujitsu.com)

### **North and South America**

Fujitsu Components America, Inc.  
250 E. Caribbean Drive  
Sunnyvale, CA 94089 U.S.A.  
Tel: (1-408) 745-4900  
Fax: (1-408) 745-4970  
Email: [marcom@fcai.fujitsu.com](mailto:marcom@fcai.fujitsu.com)  
Web: [www.fcai.fujitsu.com](http://www.fcai.fujitsu.com)

### **Europe**

Fujitsu Components Europe B.V.  
Diamantlaan 25  
2132 WV Hoofddorp  
Netherlands  
Tel: (31-23) 5560910  
Fax: (31-23) 5560950  
Email: [info.marketing@fceu.fujitsu.com](mailto:info.marketing@fceu.fujitsu.com)  
Web: [www.fceu.fujitsu.com](http://www.fceu.fujitsu.com)

### **Asia Pacific**

Fujitsu Components Asia Ltd.  
102E Pasir Panjang Road  
#04-01 Citilink Warehouse Complex  
Singapore 118529  
Tel: (65) 375-8560  
Fax: (65) 273-3021  
Email: [fcal@fcal.fujitsu.com](mailto:fcal@fcal.fujitsu.com)  
[www.fcal.fujitsu.com](http://www.fcal.fujitsu.com)

© 2001 Fujitsu Components America, Inc. All company and product names are trademarks or registered trademarks of their respective owners. Rev. 09/2001

DESIGNS FOR NEW  
FBR18ND/HD TO  
BE DISCONTINUED -  
EXCEPT  
FBR18WD