

# MINIATURE RELAY

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

## FBR211 SERIES

RoHS compliant

### ■ FEATURES

- 2 A maximum carrying current  
 Capable of 2 A maximum continuous carrying current in the contact
- Superior reliability gold-overlay contacts  
 P type: Gold-overlay silver-palladium contacts
- International terminal pitch of one inch grid terminal layout
- High sensitivity, low power dissipation types also available  
 Standard types: 0.45 W (A or B type)  
 High sensitivity types: 0.2 W (C or E type)
- Conforms to FCC 68.302 (high dielectric strength type)
- UL recognized (File number E63615)
- CSA recognized (File number LR64026)
- RoHS compliant since date code: 0433A  
 Please see page 5 for more information



### ■ ORDERING INFORMATION

[Example]      FBR211   S   A   D012   U   -   P   2   (-CSA)  
                   (a)   (b)   (c)   (d)   (e)   (f)   (g)   (h)

(a)	Series Name	FBR211
(b)	Enclosure	S: Flux free type N: Plastic sealed type
(c)	Coil Power and Schematics	A: Standard A type } (nominal power 0.45 W type) B: Standard B type } C: High sensitivity C type } (nominal power 0.2 W type) E: High sensitivity E type }
(d)	Nominal Voltage	(Example) D003: 3 VDC D012: 12 VDC (refer to the COIL DATA CHART)
(e)	UL Standard	Nil : Standard U : UL114 recognized
(f)	Contact Material	P : Gold-overlay silver-palladium M : Gold-overlay silver
(g)	Special Type	Nil : Standard 2 : High dielectric strength type
(h)	CSA Standard	Nil : Standard -CSA : UL114 + CSA recognized (e) is U

Note: The designation name is stamped on the top of the relay case as follows:  
 (Example) Designation ordered: FBR211SAD005-P  
 Stamp: 211SAD005-P

# FBR211 SERIES

## ■ SAFETY STANDARD AND FILE NUMBERS

UL114 (File No. E63615)

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

勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-34970699  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

Nominal voltage	Contact rating
1.5 to 24 VDC	1 A 28 VDC resistive 0.5 A 30 VAC resistive

## ■ SPECIFICATIONS

Item		Standard (A or B type)	High sensitive (C or E type)
Contact	Arrangement	1 form C (SPDT)	
	Material	Gold-overlay silver-palladium or gold-overlay silver	
	Resistance (initial)	Maximum 100 mΩ (at 0.1 A 6 VDC)	
	Rating (resistive)	0.5 A 120 VAC or 1 A 28 VDC	
	Maximum Carrying Current	2 A	
	Maximum Switching Power	60 VA or 28 W	
	Max. Switching Voltage*1	220 VAC or 150 VDC	
	Maximum Switching Current	1.25 A (AC) or 2 A (DC)	
	Minimum Switching load*2 (reference)	Plastic sealed 1 mA 1 Flux free 1 mA 5	
Coil	Nominal Power (at 20°C)	Approximately 0.45 W	Approximately 0.2 W
	Operate Power (at 20°C)	Approximately 0.315 W maximum	Approximately 0.14 W maximum
	Operating Temperature	-25°C to +55°C (no frost)	-25°C to +75°C (no frost)
	Operating Humidity	45 to 85%RH	
Time Value	Operate (at nominal voltage)	Maximum 5 ms	
	Release (at nominal voltage)	Maximum 5 ms	
Insulation	Resistance (initial)	Minimum 100 MΩ (at 500 VDC)	
	Dielectric Strength	between coil and contacts	500 VAC 1 minute (standard) 1,000 VAC 1 minute (high dielectric strength type)
		between open contacts	500 VAC 1 minute
Life	Mechanical	5 × 10 <sup>6</sup> operations minimum	
	Electrical (Refer to the REFERENCE DATA)	3 × 10 <sup>5</sup> operations minimum (at 1 A/ 28 VDC resistive load)	
		1 × 10 <sup>5</sup> operations minimum (at 2 A/ 12 VDC resistive load)	
Other	Vibration Resistance	10 to 55 Hz (double amplitude of 1.5 mm)	
	Shock Resistance	Misoperation	100 m/s <sup>2</sup> (11±1 ms)
		Endurance	60 m/s <sup>2</sup> (11±1 ms)
	Weight	1,000 m/s <sup>2</sup> (11±1 ms)	
	Approximately 4 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

### 1. STANDARD (A or B type)

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
A type		B type									
Flux free	Plastic sealed	Flux free	Plastic sealed								
FBR211SAD001-n	FBR211NAD001-n	FBR211SBD001-n	FBR211NBD001-n	1.5 VDC	5 Ω	300 mA	70% max. of nominal voltage	10% min. of nominal voltage	150% of nominal voltage	Approx. 450 mW (at nominal voltage)	Approx. 45 deg (at nominal voltage)
FBR211SAD003-n	FBR211NAD003-n	FBR211SBD003-n	FBR211NBD003-n	3 VDC	20 Ω	150 mA					
FBR211SAD005-n	FBR211NAD005-n	FBR211SBD005-n	FBR211NBD005-n	5 VDC	56 Ω	89 mA					
FBR211SAD006-n	FBR211NAD006-n	FBR211SBD006-n	FBR211NBD006-n	6 VDC	80 Ω	75 mA					
FBR211SAD009-n	FBR211NAD009-n	FBR211SBD009-n	FBR211NBD009-n	9 VDC	180 Ω	50 mA					
FBR211SAD012-n	FBR211NAD012-n	FBR211SBD012-n	FBR211NBD012-n	12 VDC	320 Ω	38 mA					
FBR211SAD024-n	FBR211NAD024-n	FBR211SBD024-n	FBR211NBD024-n	24 VDC	1,280 Ω	19 mA					

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

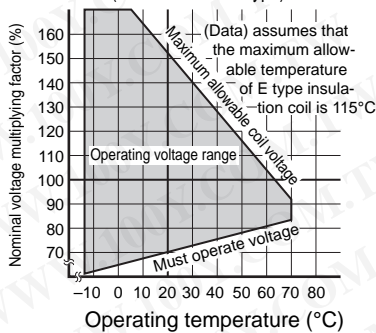
### 2. HIGH SENSITIVITY (C or E type)

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
C type		E type									
Flux free	Plastic sealed	Flux free	Plastic sealed								
FBR211SCD001-n	FBR211NCD001-n	FBR211SED001-n	FBR211NED001-n	1.5 VDC	12 Ω	125 mA	70% max. of nominal voltage	10% min. of nominal voltage	225% of nominal voltage	Approx. 200 mW (at nominal voltage)	Approx. 25 deg (at nominal voltage)
FBR211SCD003-n	FBR211NCD003-n	FBR211SED003-n	FBR211NED003-n	3 VDC	45 Ω	67 mA					
FBR211SCD005-n	FBR211NCD005-n	FBR211SED005-n	FBR211NED005-n	5 VDC	120 Ω	42 mA					
FBR211SCD006-n	FBR211NCD006-n	FBR211SED006-n	FBR211NED006-n	6 VDC	180 Ω	33 mA					
FBR211SCD009-n	FBR211NCD009-n	FBR211SED009-n	FBR211NED009-n	9 VDC	400 Ω	23 mA					
FBR211SCD012-n	FBR211NCD012-n	FBR211SED012-n	FBR211NED012-n	12 VDC	700 Ω	17 mA					
FBR211SCD024-n	FBR211NCD024-n	FBR211SED024-n	FBR211NED024-n	24 VDC	2,800 Ω	9 mA					

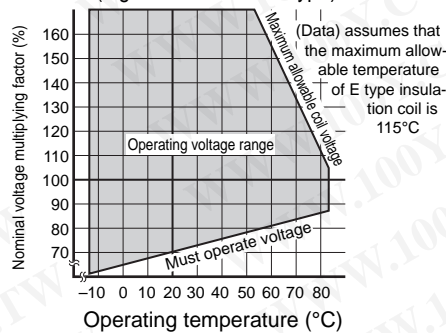
Note: All values in the table are measured at 20°C.

## CHARACTERISTIC DATA

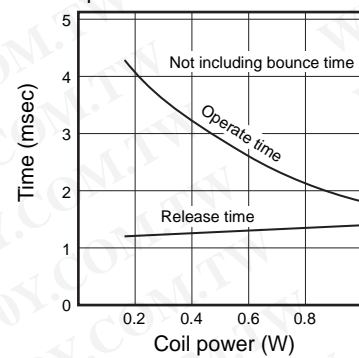
Range of operation temperature and voltage  
(Standard 0.45 W type)



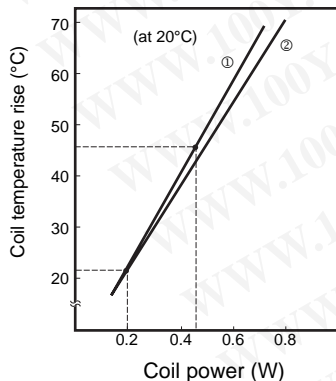
Range of operation temperature and voltage  
(high sensitive 0.2 W type)



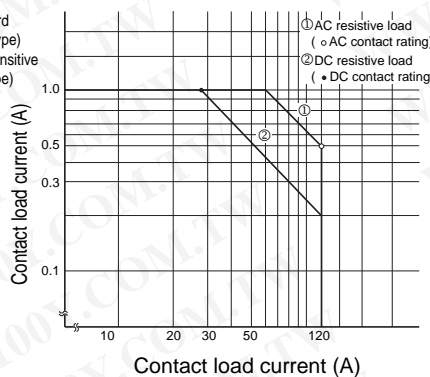
Operate and release time data



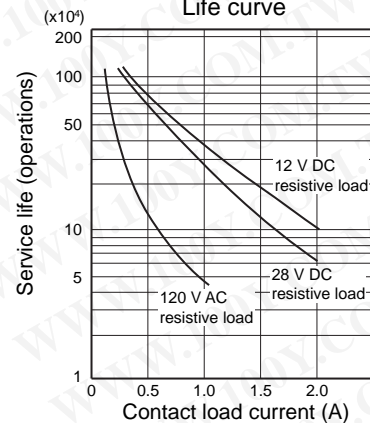
Coil temperature rise data



Maximum switching capacity



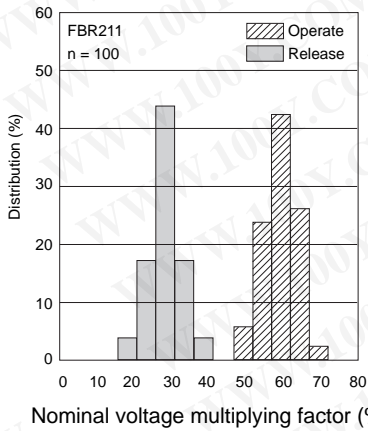
Life curve



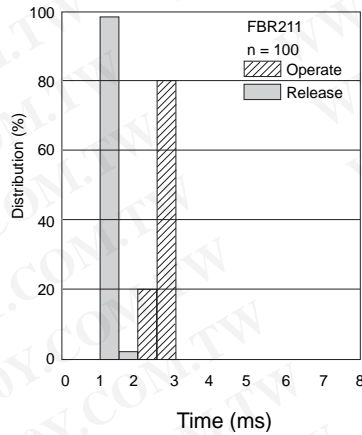
# FBR211 SERIES

## REFERENCE DATA

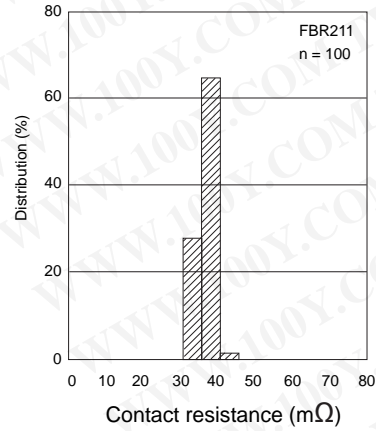
Distribution of operate and release voltage



Distribution of operate and release time



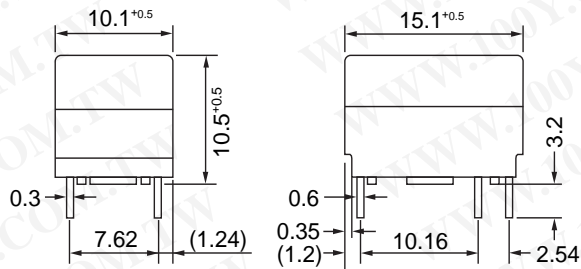
Distribution of contact resistance



## DIMENSIONS

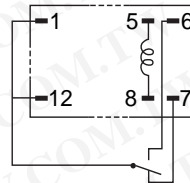
### 1. STANDARD (Flux free type)

#### ●Dimensions

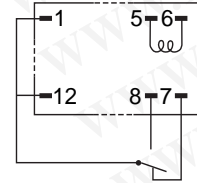


#### ●Schematics (BOTTOM VIEW)

(A type or C type)

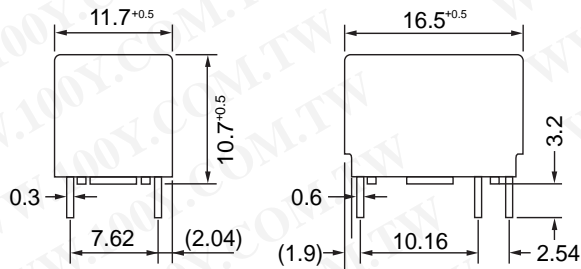


(B type or E type)



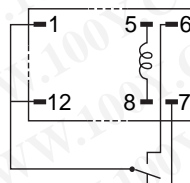
### 2. N-TYPE (Plastic sealed type)

#### ●Dimensions

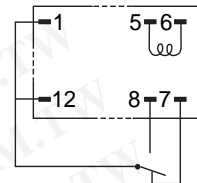


#### ●Schematics (BOTTOM VIEW)

(A type or C type)

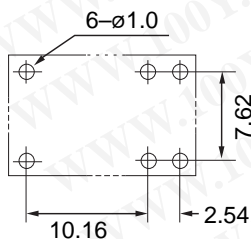


(B type or E type)



### 3. PC BOARD MOUNTING HOLE LAYOUT

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



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Unit: mm

## RoHS Compliance and Lead Free Relay Information

### 1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. Most of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and most power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

### 2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu.

#### Reflow Solder condition

**Flow Solder condition:**

Pre-heating: maximum 120°C  
Soldering: dip within 5 sec. at  
260°C solder bath

**Solder by Soldering Iron:**

Soldering Iron  
Temperature: maximum 360°C  
Duration: maximum 3 sec.

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**We highly recommend that you confirm your actual solder conditions**

### 3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to electromechanical relays.

### 4. Tin Whisker

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

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