

# MINIATURE RELAY

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

### FBR211 SERIES

#### ■ 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)



#### ■ 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<br>N: Plastic sealed type                                                                                                                         |
| (c) | Coil Power and Schematics | A: Standard A type } (nominal power 0.45 W type)<br>B: Standard B type }<br>C: High sensitivity C type } (nominal power 0.2 W type)<br>E: High sensitivity E type } |
| (d) | Nominal Voltage           | (Example) D003: 3 VDC<br>D012: 12 VDC (refer to the COIL DATA CHART)                                                                                                |
| (e) | UL Standard               | Nil : Standard<br>U : UL114 recognized                                                                                                                              |
| (f) | Contact Material          | P : Gold-overlay silver-palladium<br>M : Gold-overlay silver                                                                                                        |
| (g) | Special Type              | Nil : Standard<br>2 : High dielectric strength type                                                                                                                 |
| (h) | CSA Standard              | Nil : Standard<br>–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

## ■ SAFETY STANDARD AND FILE NUMBERS

UL114 (File No. E63615)

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

| Nominal voltage | Contact rating                                 |
|-----------------|------------------------------------------------|
| 1.5 to 24 VDC   | 1 A 28 VDC resistive<br>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* <sup>1</sup>             | 220 VAC or 150 VDC                                                     |                                                                                   |
|            | Maximum Switching Current                        | 1.25 A (AC) or 2 A (DC)                                                |                                                                                   |
|            | Minimum Switching load* <sup>2</sup> (reference) | Plastic sealed 1 mA 1<br>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)<br>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<br>(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± <sup>1</sup> ms)                                        |
|            |                                                  | Endurance                                                              | 60 m/s <sup>2</sup> (11± <sup>1</sup> ms)                                         |
|            | Weight                                           | Approximately 4 g                                                      |                                                                                   |

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

\*<sup>2</sup> 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.

# FBR211 SERIES

## 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-□ | FBR211NAD001-□ | FBR211SBD001-□ | FBR211NBD001-□ | 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-□ | FBR211NAD003-□ | FBR211SBD003-□ | FBR211NBD003-□ | 3 VDC           | 20 Ω                   | 150 mA                                       |                             |                             |                           |                                     |                                     |
| FBR211SAD005-□ | FBR211NAD005-□ | FBR211SBD005-□ | FBR211NBD005-□ | 5 VDC           | 56 Ω                   | 89 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SAD006-□ | FBR211NAD006-□ | FBR211SBD006-□ | FBR211NBD006-□ | 6 VDC           | 80 Ω                   | 75 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SAD009-□ | FBR211NAD009-□ | FBR211SBD009-□ | FBR211NBD009-□ | 9 VDC           | 180 Ω                  | 50 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SAD012-□ | FBR211NAD012-□ | FBR211SBD012-□ | FBR211NBD012-□ | 12 VDC          | 320 Ω                  | 38 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SAD024-□ | FBR211NAD024-□ | FBR211SBD024-□ | FBR211NBD024-□ | 24 VDC          | 1,280 Ω                | 19 mA                                        |                             |                             |                           |                                     |                                     |

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

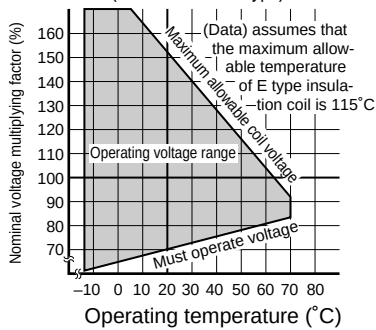
### 2. HIGH SENSITIVITY (C or E type)

| 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-□ | FBR211NCD001-□ | FBR211SED001-□ | FBR211NED001-□ | 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-□ | FBR211NCD003-□ | FBR211SED003-□ | FBR211NED003-□ | 3 VDC           | 45 Ω                   | 67 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SCD005-□ | FBR211NCD005-□ | FBR211SED005-□ | FBR211NED005-□ | 5 VDC           | 120 Ω                  | 42 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SCD006-□ | FBR211NCD006-□ | FBR211SED006-□ | FBR211NED006-□ | 6 VDC           | 180 Ω                  | 33 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SCD009-□ | FBR211NCD009-□ | FBR211SED009-□ | FBR211NED009-□ | 9 VDC           | 400 Ω                  | 23 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SCD012-□ | FBR211NCD012-□ | FBR211SED012-□ | FBR211NED012-□ | 12 VDC          | 700 Ω                  | 17 mA                                        |                             |                             |                           |                                     |                                     |
| FBR211SCD024-□ | FBR211NCD024-□ | FBR211SED024-□ | FBR211NED024-□ | 24 VDC          | 2,800 Ω                | 9 mA                                         |                             |                             |                           |                                     |                                     |

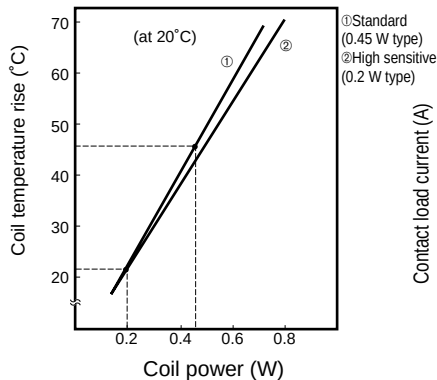
Note: All values in the table are measured at 20°C.

## CHARACTERISTIC DATA

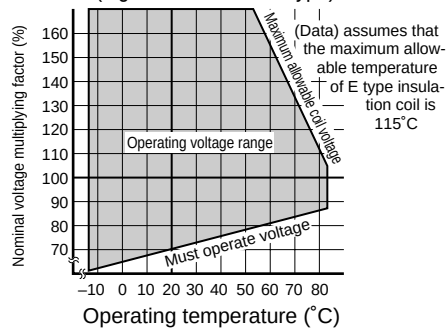
Range of operation temperature and voltage  
(Standard 0.45 W type)



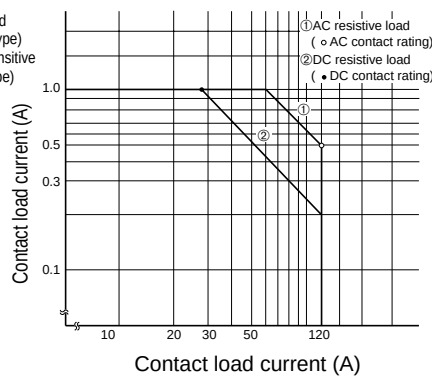
Coil temperature rise data



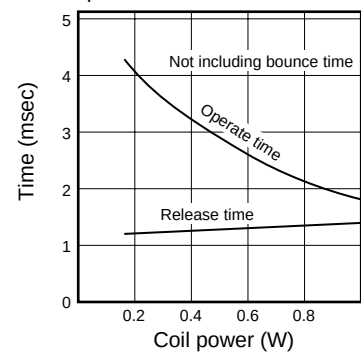
Range of operation temperature and voltage  
(high sensitive 0.2 W type)



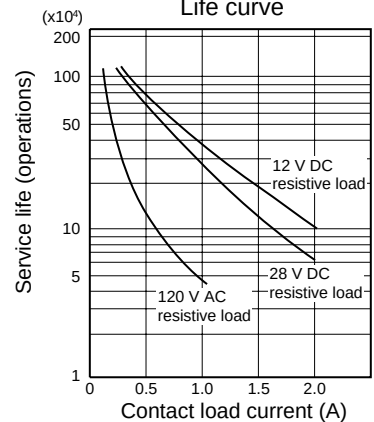
Maximum switching capacity



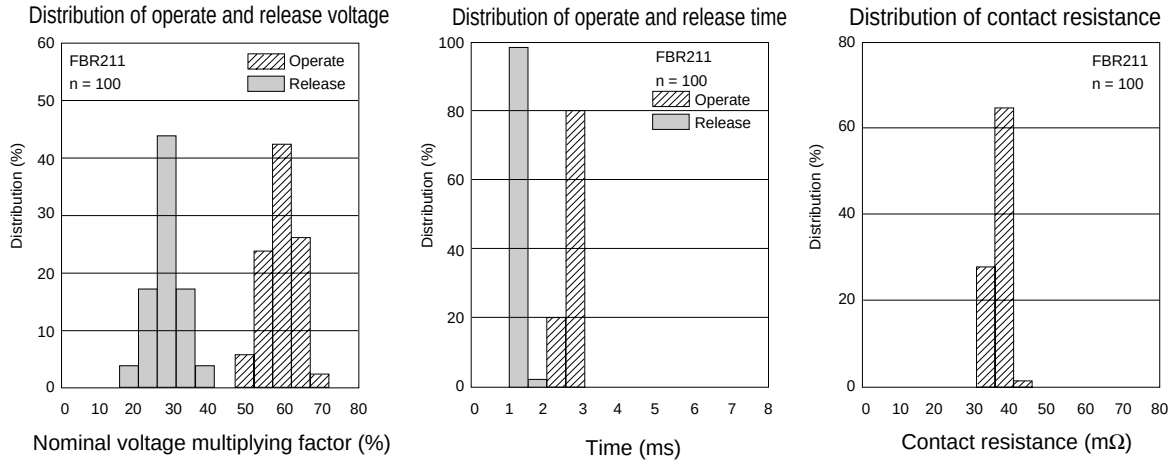
Operate and release time data



Life curve



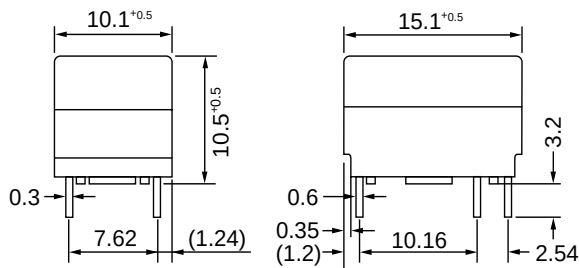
## REFERENCE DATA



## DIMENSIONS

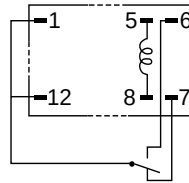
### 1. STANDARD (Flux free type)

#### ●Dimensions

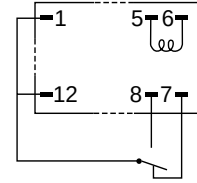


#### ●Schematics (BOTTOM VIEW)

(A type or C type)

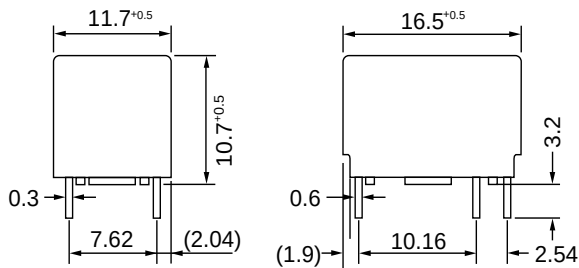


(B type or E type)



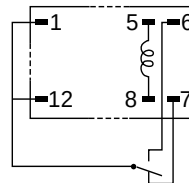
### 2. N-TYPE (Plastic sealed type)

#### ●Dimensions

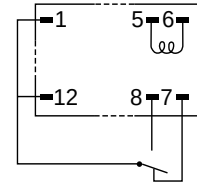


#### ●Schematics (BOTTOM VIEW)

(A type or C type)

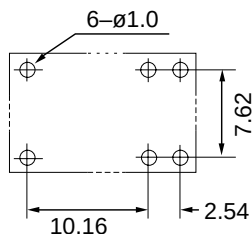


(B type or E type)



### 3. PC BOARD MOUNTING HOLE LAYOUT

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



Unit: mm

## **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@fceu.fujitsu.com](mailto:info@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) 6375-8560  
Fax: (65) 6273-3021  
Email: [fcal@fcal.fujitsu.com](mailto:fcal@fcal.fujitsu.com)  
[www.fcal.fujitsu.com](http://www.fcal.fujitsu.com)

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