

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
- Internally terminal pitch of one inch grid terminal layout
- High sensitivity, low power dissipation types also available
Standard types: 0.4 W (A or B type)
High sensitivity type: 0.1 W (C or E type)
- Conforms to FCC 68.512 (high dielectric strength type)
- UL recognized (File number E5615)
- CSA recognized (File number LR6416)
- RoHS compliant since date code 4321
Please see page 5 for more information



ORDERING INFORMATION

[Example] $\frac{\text{FBR211}}{\text{(a)}} \frac{\text{S}}{\text{(b)}} \frac{\text{A}}{\text{(c)}} \frac{\text{D012}}{\text{(d)}} \frac{\text{U}}{\text{(e)}} - \frac{\text{P}}{\text{(f)}} \frac{\text{ }}{\text{(g)}} \frac{\text{ }}{\text{(h)}} \text{ (CSA)}$

(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 450 mW type) B: Standard B type } C: High sensitivity C type } (nominal power 200 mW type) E: High sensitivity E type }
(d)	Nominal Voltage	(Example) D003: 3 VDC D012: 12 VDC (refer to the COIL DATA CHART)
(e)	UL Marking on Cover	Nil : No UL marking U : UL marking
(f)	Contact Material	P : Gold-overlay silver-palladium M : Gold-overlay silver
(g)	Special Type	Nil : Standard 2 : High dielectric strength type
(h)	CSA Marking	Nil : Standard -CSA : UL + CSA marking (valid when (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

COIL DATA CHART

1. STANDARD (A or B type)

MODEL				Nominal voltage	Coil resistance ($\pm 10\%$)	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 SENSITIVE (C or E type)

MODEL				Nominal voltage	Coil resistance ($\pm 10\%$)	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	150 Ω	33 mA					
FBR211SCD009-n	FBR211NCD009-n	FBR211SED009-n	FBR211NED009-n	9 VDC	300 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	8 mA					

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

FBR211 SERIES

■ SPECIFICATIONS

Item		Standard (A or B type)	High sensitive (C or E type)
Contact	Arrangement	1 form C (SPDT)	
	Material	Gold-overlay silver-palladium / 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, 1V Flux free 1 mA, 5V	
Coil	Nominal Power (20°C)	Approximately 450 mW	Approximately 200 mW
	Operate Power (at 20°C)	Approximately 315 mW maximum	Approximately 140 mW maximum
	Operating Temperature	-25°C to +55°C (no frost)	-25°C to +75°C (no frost)
	Operating Humidity	5 to 85%RH	
Time Value	Operate (at nominal voltage)	Maximum 5 ms	
	Release (at nominal voltage)	Maximum 5 ms	
Life	Mechanical	5 × 10 ⁶ operations minimum	
	Electrical (Refer to the REFERENCE DATA)	3 × 10 ⁶ operations minimum (at 1 A/ 28 VDC resistive load) 1 × 10 ⁵ operations minimum (at 2 A/ 12 VDC resistive load) 1 × 10 ⁵ operations minimum (at 0.5 A/120 VDC resistive load)	
Other	Vibration Resistance	10 to 55 Hz (double amplitude) of 1.5 mm)	
	Shock Resistance	Misoperation	100 m/s ² (11±1 ms) 60 m/s ² (11±1 ms)
		Endurance	1,000 m/s ² (11±1 ms)
Weight	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.

■ INSULATION

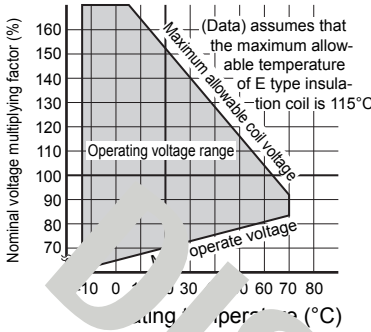
Item	Standard (A or B)	High sensitive (C or E)
Isolation (initial)	Minimum 100 MΩ (at 500VDC)	
Dielectric Strength	500VAC 1 min. (standard) 1,500VAC 1 min. (high isolation coil and contact)	

■ SAFETY STANDARDS

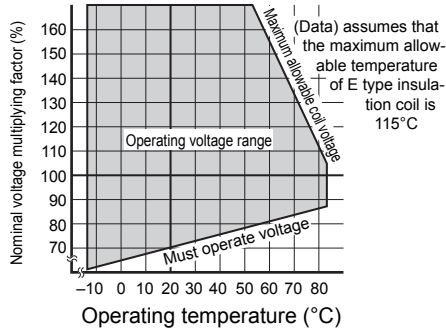
Type	Compliance	Contact rating
UL	UL 110 E63615	Flammability: UL 94-V0 (plastics) 0.5A, 120VAC (resistive)
CSA	C22.2 No. 14 LR 40304, LR 46016	1A, 28VDC (resistive)

CHARACTERISTIC DATA

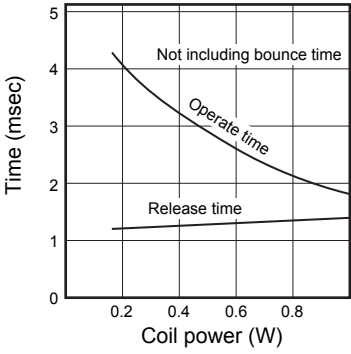
Range of operation temperature and voltage
(Standard 0.45 W type)



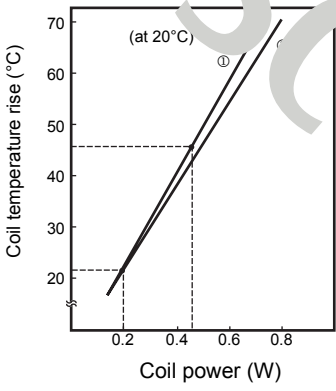
Range of operation temperature and voltage
(high sensitive 0.2 W type)



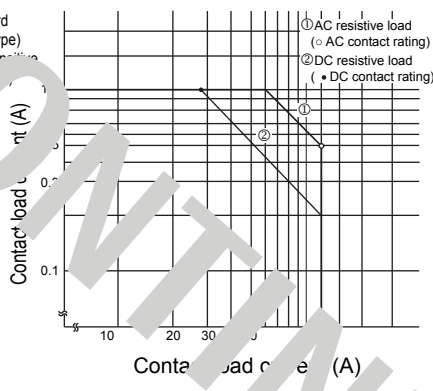
Operate and release time data



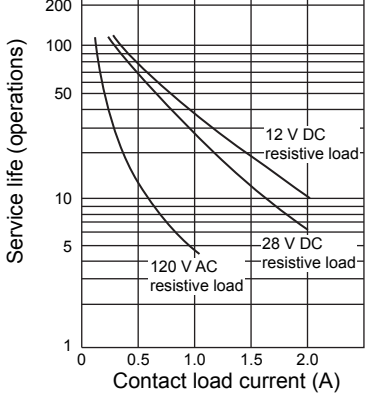
Coil temperature rise data



Maximum switching capacity

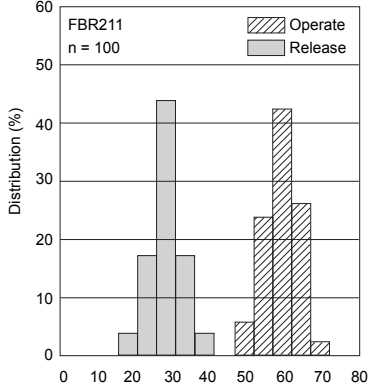


Life curve

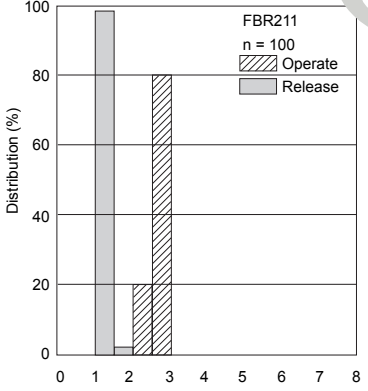


REFERENCE DATA

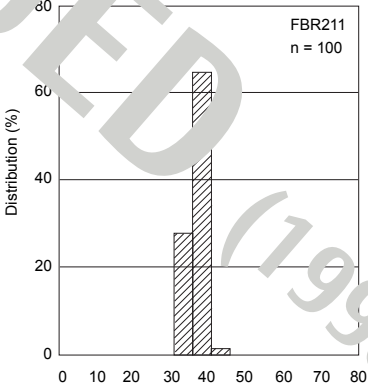
Distribution of operate and release voltage



Distribution of operate and release time



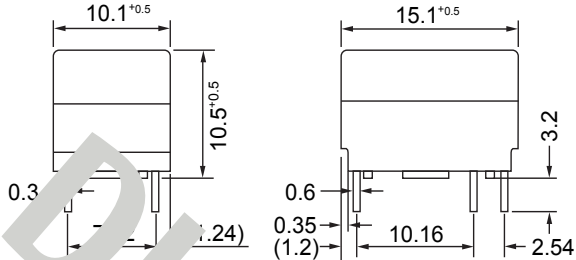
Distribution of contact resistance



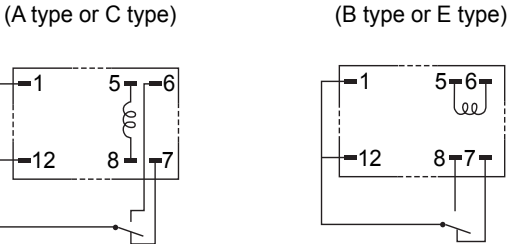
■ DIMENSIONS

1. STANDARD (Flux free type)

●Dimensions

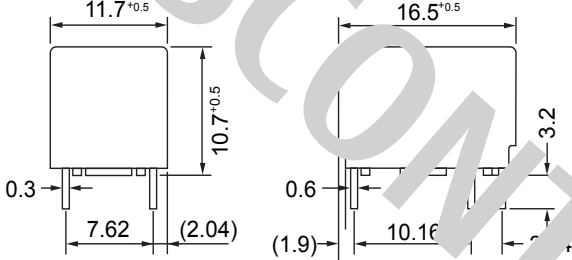


●Schematics (BOTTOM VIEW)

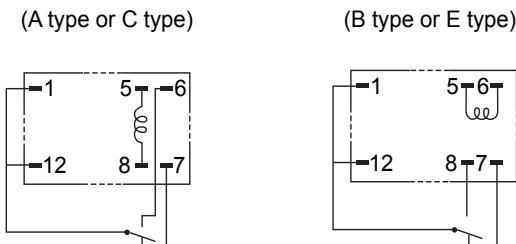


2. N-TYPE (Flux free type)

●Dimensions

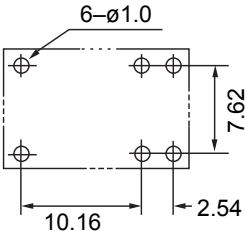


●Schematics (BOTTOM VIEW)



3. PC BOARD MOUNTING HOLE LAYOUT

●PC board mounting hole layout (BOTTOM VIEW)



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 (incompatible, etc.).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (leaded-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.

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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Rev. January 18, 2008.