FUJITSU THE POSSIBILITIES ARE INFINITE

MINIATURE RELAY

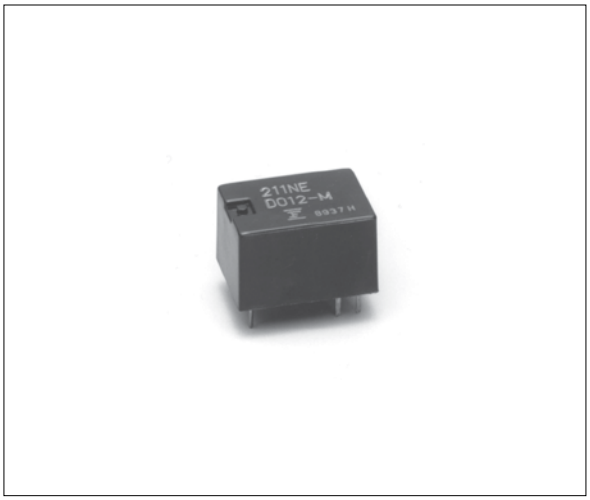
1 POLE—1 to 2 A (FOR SIGNAL SWITCHING)

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 (a) S (b) A (c) D012 (d) U (e) – P (f) 2 (g) (–CSA) (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 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

■ 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.

■ 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 (at 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		45 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)		3×10^5 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

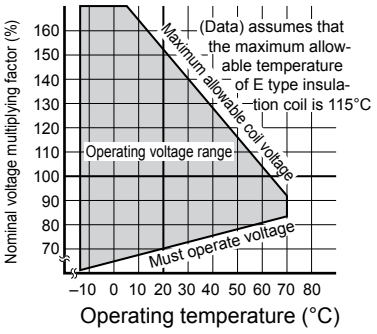
Item		Standard (A or B)	High sensitive (C or E)
Isolation (initial)		Minimum 100 MΩ (at 500VDC)	
Dielectric Strength		500VAC 1 min. (standard) 1,500VAC 1 min. (high isolation coil and contact)	

■ SAFETY STANDARDS

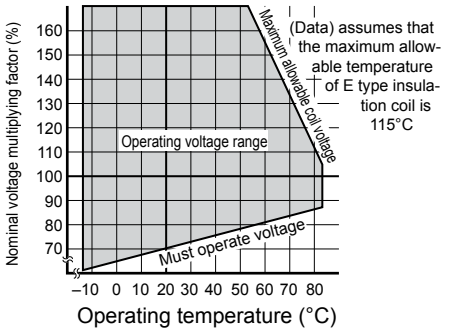
Type	Compliance	Contact rating
UL	UL 110 E63615	Flammability: UL 94-V0 (plastics) 0.5A, 120VAC (resistive) 1A, 28VDC (resistive)
CSA	C22.2 No. 14 LR 40304, LR 46016	

■ CHARACTERISTIC DATA

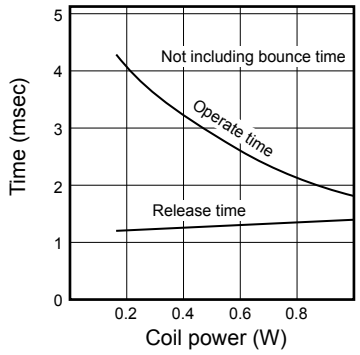
Range of operation temperature and voltage
(Standard 0.45 W type)



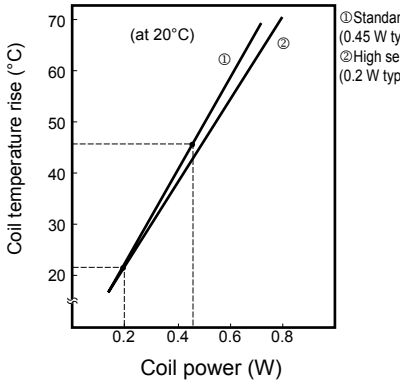
Range of operation temperature and voltage
(high sensitive 0.2 W type)



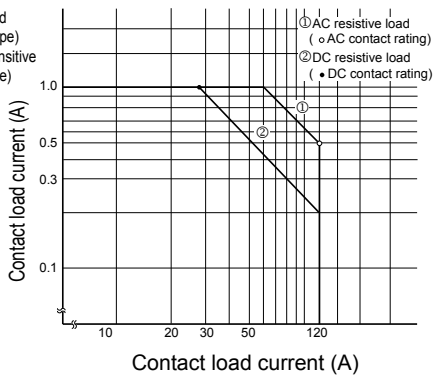
Operate and release time data



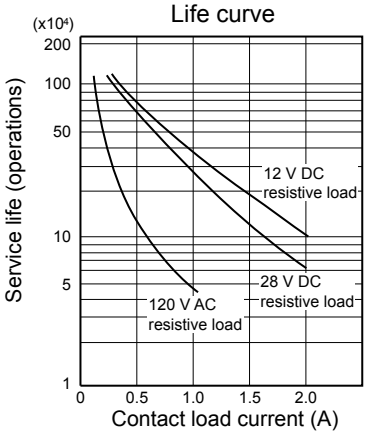
Coil temperature rise data



Maximum switching capacity

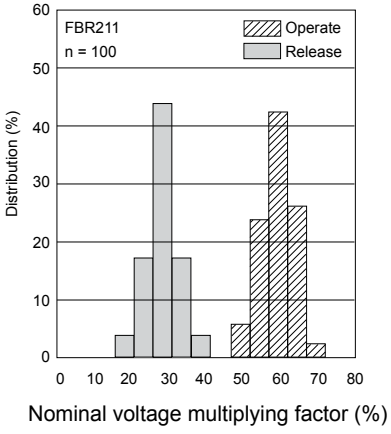


Life curve

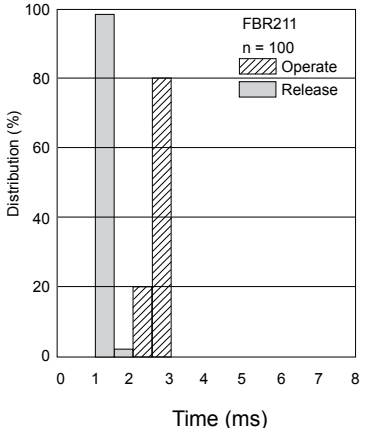


■ REFERENCE DATA

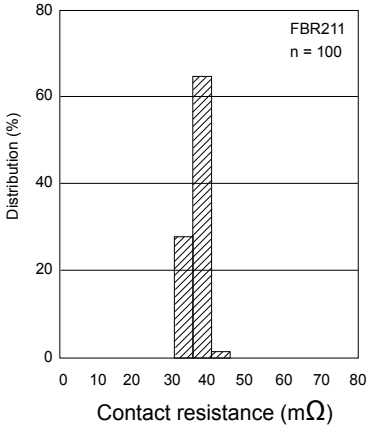
Distribution of operate and release voltage



Distribution of operate and release time



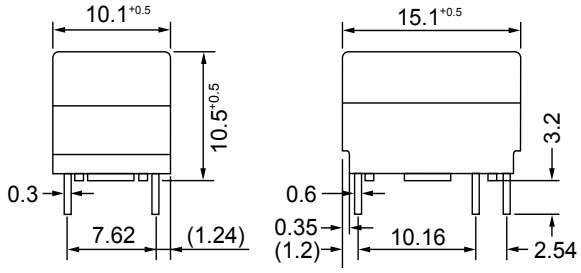
Distribution of contact resistance



■ DIMENSIONS

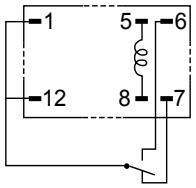
1. STANDARD (Flux free type)

●Dimensions

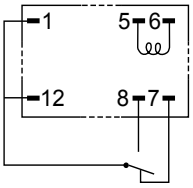


●Schematics (BOTTOM VIEW)

(A type or C type)

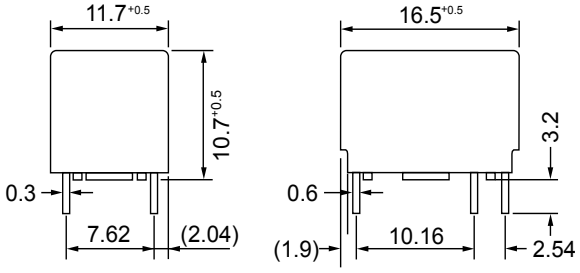


(B type or E type)



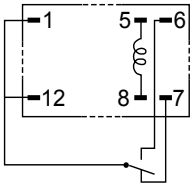
2. N-TYPE (Plastic sealed type)

●Dimensions

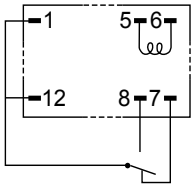


●Schematics (BOTTOM VIEW)

(A type or C type)

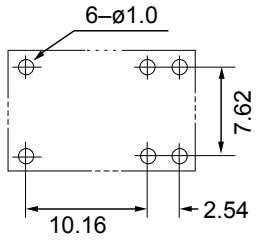


(B type or E type)



3. PC BOARD MOUNTING HOLE LAYOUT

●PC board mounting hole layout (BOTTOM VIEW)



Unit: mm

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 soler 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 realys.

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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