FUJITSU THE POSSIBILITIES ARE INFINITE

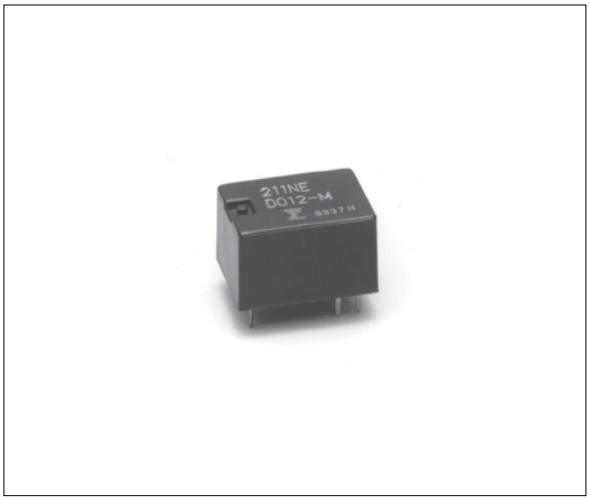
MINIATURE RELAY

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 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 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

■ 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 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		5×10^6 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.

■ 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.

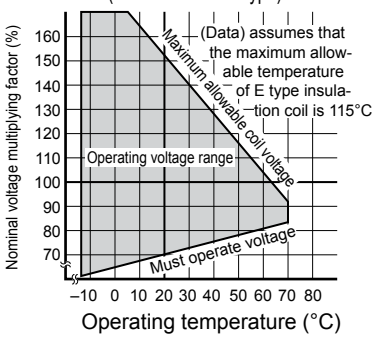
2. HIGH SENSITIVITY (C or E type)

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					

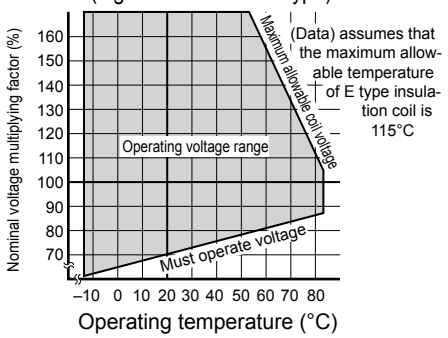
Note: All values in the table are measured at 20°C.

■ CHARACTERISTIC DATA

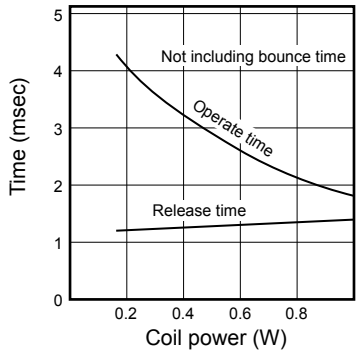
Range of operation temperature and voltage
(Standard 0.45 W type)



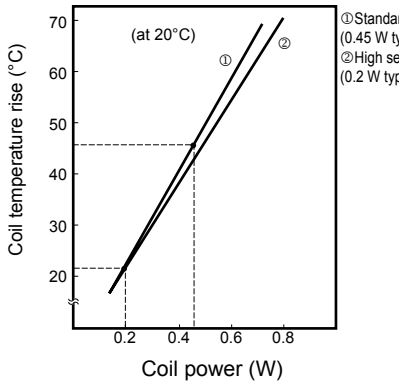
Range of operation temperature and voltage
(high sensitive 0.2 W type)



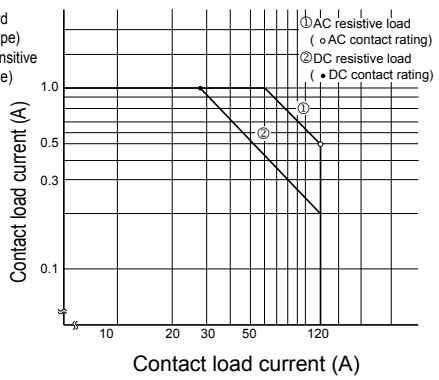
Operate and release time data



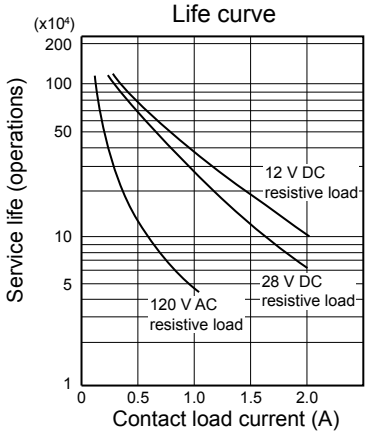
Coil temperature rise data



Maximum switching capacity

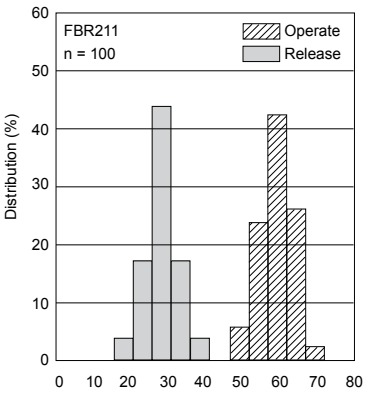


Life curve

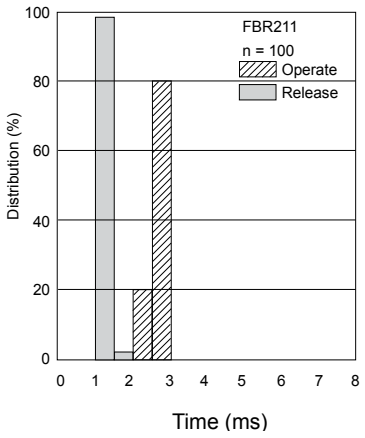


■ REFERENCE DATA

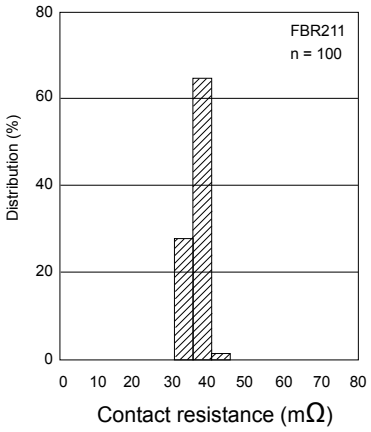
Distribution of operate and release voltage



Distribution of operate and release time



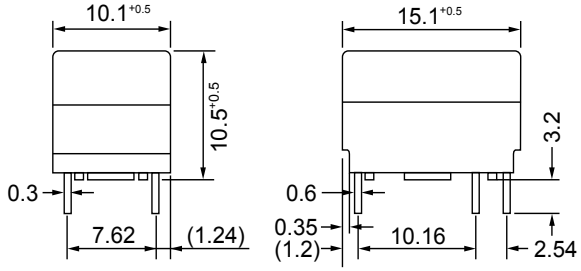
Distribution of contact resistance



■ DIMENSIONS

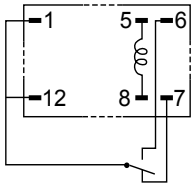
1. STANDARD (Flux free type)

●Dimensions

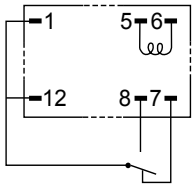


●Schematics (BOTTOM VIEW)

(A type or C type)

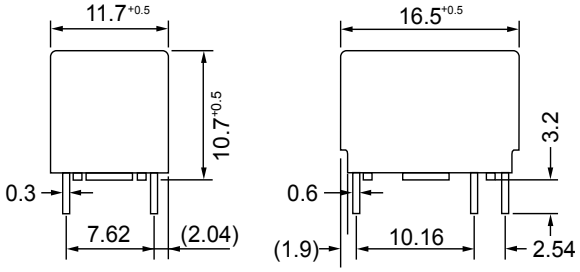


(B type or E type)



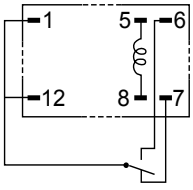
2. N-TYPE (Plastic sealed type)

●Dimensions

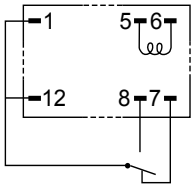


●Schematics (BOTTOM VIEW)

(A type or C type)

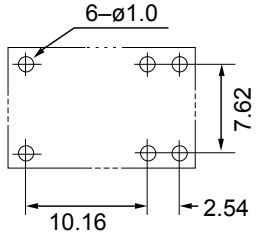


(B type or E type)



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 condtion

Flow Solder condtion:

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.

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
Web: 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: components@us.fujitsu.com
Web: http://www.fujitsu.com/us/services/edevices/components/

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
Web: emea.fujitsu.com/components/

Asia Pacific
Fujitsu Components Asia Ltd.
102E Pasir Panjang Road
#01-01 Citilink Warehouse Complex
Singapore 118529
Tel: (65) 6375-8560
Fax: (65) 6273-3021
Email: fcal@fcal.fujitsu.com
Web: http://www.fujitsu.com/sg/services/micro/components/