MINIATURE RELAY

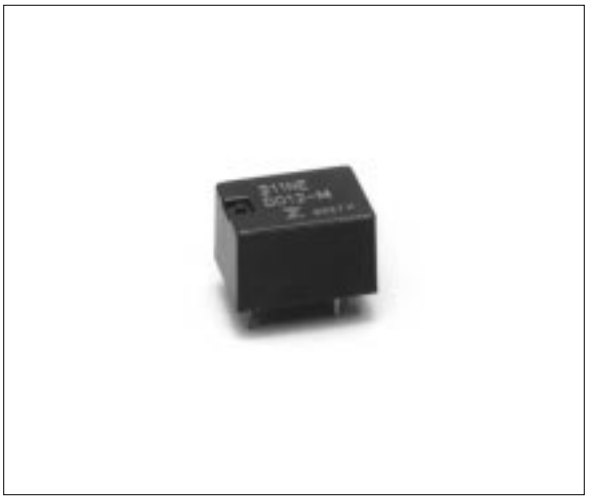
1 POLE—1 to 3 A (FOR AUTOMOTIVE APPLICATIONS)

FBR211 SERIES

RoHS Compliant

■ FEATURES

- Suitable for automotive applications of solenoid load controls, car audio, etc.
- Capable of 3 A/1 hour maximum carrying current in the contact.
- Superior reliability gold-overlay contact.
  P type: gold-overlay silver-palladium contacts.
- High sensitivity, high temperature types also available.
  Standard type: –30°C to +60°C (A or B type)
  High sensitivity type: –30°C to +80°C (C or E type)
- RoHS compliant since date code: 0433A
  Please see page 5 for more information



■ ORDERING INFORMATION

[Example] FBR211 (a) S (b) A (c) D012 (d) – P (e) ** (f)

(a)	Series Name	FBR211: FBR211 Series
(b)	Enclosure	S : Flux free type N : Plastic sealed type
(c)	Coil Specification and Schematics	A : Standard A type } (coil nominal power 0.45 W type) B : Standard B type } C : High sensitivity C type } (coil nominal power 0.2 W type) E : High sensitivity E type }
(d)	Nominal Voltage	D009: 9 VDC D012: 12 VDC
(e)	Contact Material	P : Gold overlay silver palladium
(f)	Custom Designation	To be assigned custom specification

■ SPECIFICATIONS

Item			Specifications
Contact	Arrangement		1 form C (SPDT)
	Material		Gold-overlay silver-palladium
	Resistance		Maximum 100 m Ω(at 0.1 A 6 VDC)
	Voltage Drop (Resistance)		Maximum 100 mV (at 2 A 12 VDC)
	Rating		14 VDC 2 A (locked motor load) 14 VDC inrush 8 A (condenser, lamp load)
	Maximum Carrying Current		2 A (continuously) , 3 A/1hour (25°C,100% rated coil voltage)
	Maximum Switching Current		2 A 16 VDC (referece)
Coil	Operating Temperature		Standard type: –30°C to + 60°C High sensitive type: –30°C to + 80°C (no frost)
Time Value	Operate (at nominal voltage)		Maximum 5 ms
	Release (at nominal voltage)		Maximum 5 ms
Life	Mechanical		5×10^6 operations minimum
	Electrical		1×10^5 operations minimum (14 VDC, maximum switching current, resistive load)
Other	Vibration Resistance		10 to 55 Hz (double amplitude of 1.5 mm)
	Shock Resistance	Misoperation	100 m/s^2
		Endurance	1,000 m/s^2
	Weight		Approximately 4 g

■ COIL RATINGS

1. STANDARD Type

MODEL				Nominal voltage	Coil resistance (±10%)	Must operate voltage	Nominal power	Coil temperature rise	Thermal resistance
A type		B type							
Flux free type	Plastic sealed type	Flux free type	Plastic sealed type						
FBR211SAD009-P	FBR211NAD009-P	FBR211SBD009-P	FBR211NBD009-P	9 VDC	180 Ω	6.3 V (20°C) 7.3 V (60°C)	Approx. 450 mW	Approx. 45 deg	100°C/W
FBR211SAD012-P	FBR211NAD012-P	FBR211SBD012-P	FBR211NBD012-P	12 VDC	320 Ω	8.4 V (20°C) 9.7 V (60°C)			

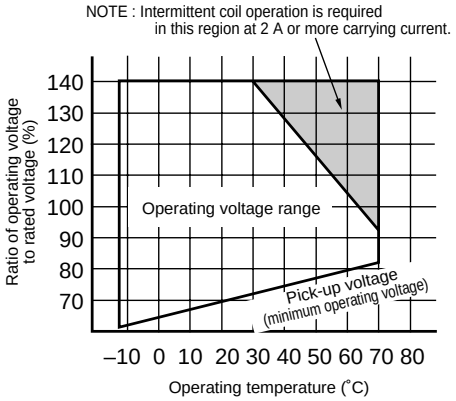
2. HIGH SENSITIVITY Type

MODEL				Nominal voltage	Coil resistance (±10%)	Must operate voltage	Nominal power	Coil temperature rise	Thermal resistance
C type		E type							
Flux free type	Plastic sealed type	Flux free type	Plastic sealed type						
FBR211SCD009-P	FBR211NCD009-P	FBR211SED009-P	FBR211NED009-P	9 VDC	400 Ω	6.3 V (20°C) 7.3 V (60°C)	Approx. 200 mW	Approx. 25 deg	125°C/W
FBR211SCD012-P	FBR211NCD012-P	FBR211SED012-P	FBR211NED012-P	12 VDC	700 Ω	8.4 V (20°C) 9.7 V (60°C)			

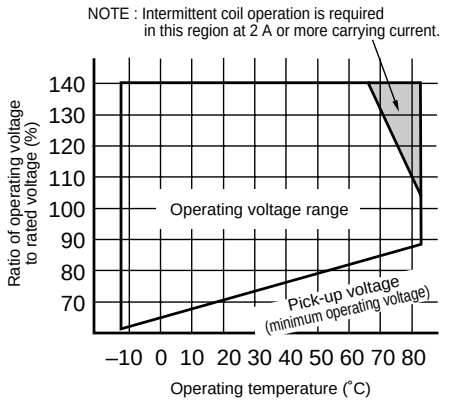
Note: All values in these tables are measured at 20°C.

■ CHARACTERISTIC DATA

[Standard type (coil 0.45 W type)]

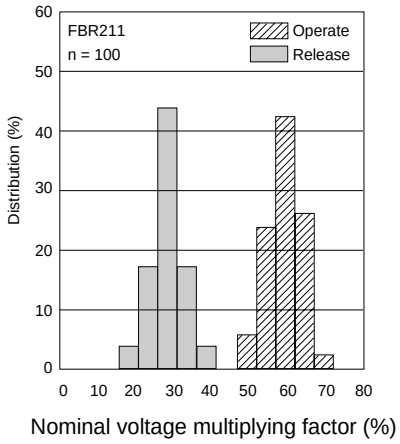


[High sensitivity type (coil 0.2 W type)]

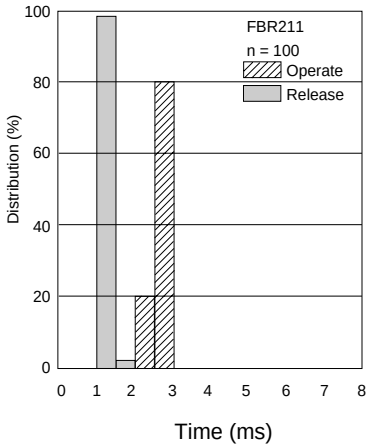


■ REFERENCE DATA

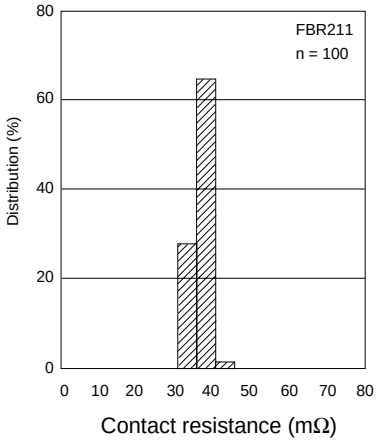
Distribution of operate and release voltage



Distribution of operate and release time

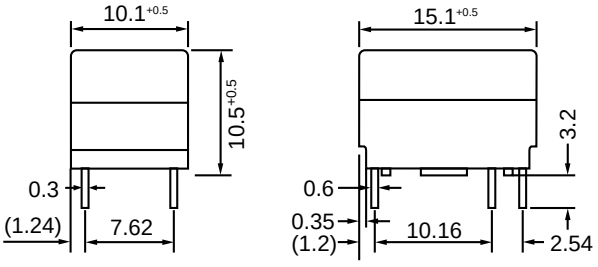


Distribution of contact resistance

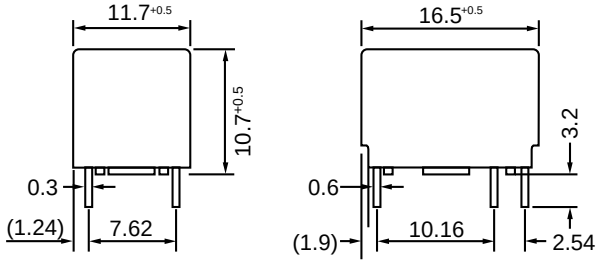


■ DIMENSIONS

● Flux Free Type

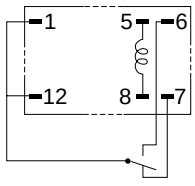


● Plastic Sealed Type

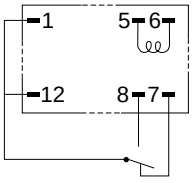


● Schematics (BOTTOM VIEW)

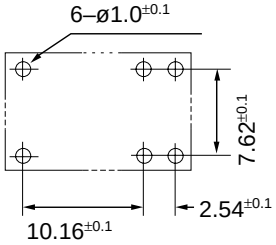
(A type, C type)



(B type, E type)



● PC board mounting hole layout (BOTTOM VIEW)



Unit: mm

RoHS Compliance and Lead Free Relay Information

1. General Information

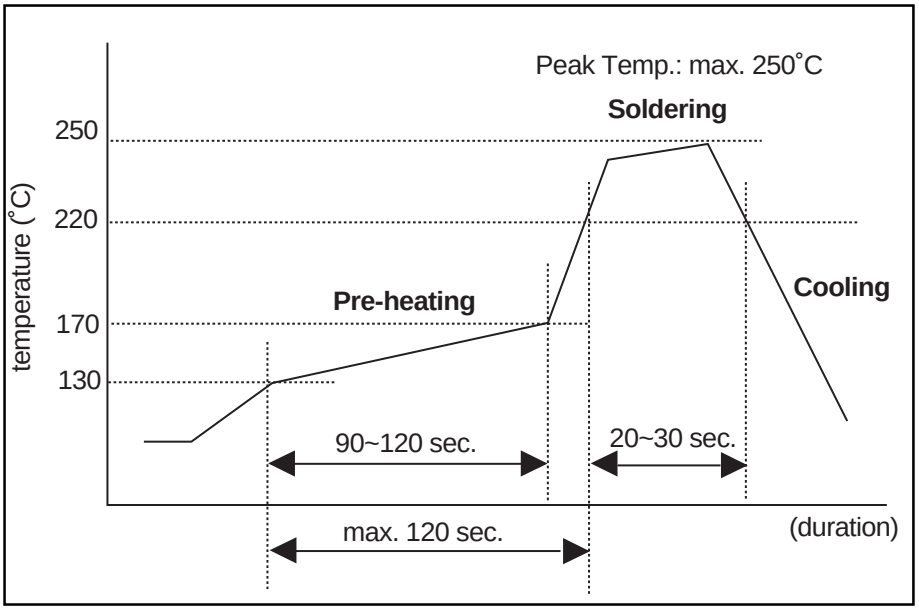
- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. Most of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (http://www.fcai.fujitsu.com/pdf/LeadFreeLetter.pdf)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu. From February 2005 forward Sn-3.0Cu-Ni will be used for FTRB3 and FTR-B4 series relays.
- Most signal and some power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 6 hazardous materials that are restricted by RoHS directive (lead, mercury, cadmium, 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.

2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu and Sn-3.0 Cu-Ni (only FTR-B3 and FTR-B4 from February 2005)

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

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

5. Solid State Relays

- Each lead terminal will be changed from solder plating to Sn plating and Nickel plating. A layer of Nickel plating is between the terminal and the Sn plating to avoid whisker.

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: marcom@fcai.fujitsu.com
Web: 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
Web: 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
www.fcal.fujitsu.com