

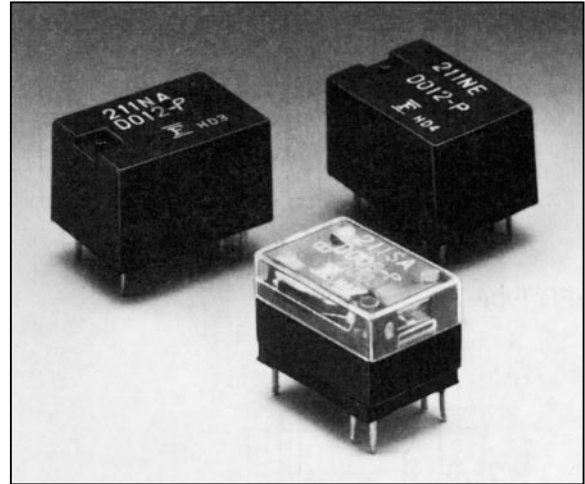
# MINIATURE RELAY

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

### FBR210 SERIES

#### ■ FEATURES

- 2 A maximum carrying current  
Capable of 2 A maximum continuous carrying current in the contact.
- Superior sensitive gold-overlay contacts  
P type: Gold-overlay silver-palladium contacts
- International terminal pitch of one inch grid terminal layout
- High sensitive, 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]  $\frac{\text{FBR211}}{\text{(a)}} \frac{\text{S}}{\text{(b)}} \frac{\text{A}}{\text{(c)}} \frac{\text{D012}}{\text{(d)}} \frac{\text{U}}{\text{(e)}} - \frac{\text{P}}{\text{(f)}} \frac{\text{(2)}}{\text{(g)}} \frac{\text{(-CSA)}}{\text{(h)}}$

(a)	Series Name	FBR211: FBR210 Series
(b)	Enclosure	Nil: Flux Free Type N: Plastic Sealed Type
(c)	Coil power and Schematics	A: Standard A type } (Nominal power 0.4 W type) B: Standard B type } C: High sensitive C type } (Nominal power 0.2 W type) E: High sensitive E type }
(d)	Nominal Voltage	(Example) D003: 3 VDC D012: 12 VDC (Refer to the COIL DATA CHART)
(e)	UL Standard	Nil: Standard U: UL114 Recognized
(f)	Contact Material	P: Gold-overlay silver-palladium
(g)	Special Type	Nil: Standard 2: High Dielectric Strength Type
(h)	CSA Standard	Nil: Standard -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: FBR21SAD005-P  
Stamp: 211SAD005-P

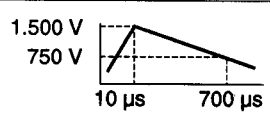
## ■ SAFETY STANDARD & FILE NUMBERS

UL114 (File No. E63615)

C22.2 No. 0, No. 1, 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		
	Resistance (initial)	Max. 100 mΩ (at 0.1 A 6 VDC)		
	Rating (resistive)	0.5 A 120 VAC or 1 A 28 VDC		
	Max. Carrying Current	2 A		
	Max. Switching Power	60 VA or 28 W		
	Max. Switching Voltage* <sup>1</sup>	220 VAC or 150 VDC		
	Max. Switching Current	1.25 A (AC) or 2 A (DC)		
	Min. Switching load* <sup>2</sup> (Reference)	Prastic sealed 1 mA 1 VDC Flux free 1 mA 5 VDC		
Coil	Nominal power (at 20°C)	Approx. 0.45 W	Approx. 0.2 W	
	Operate power (at 20°C)	Approx. 0.315 W Max.	Approx. 0.14 W Max.	
	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)	Max. 5 ms (Not including bounce time)		
	Release (at Nominal voltage)	Max. 5 ms (Not including bounce time)		
Insulation	Resistance (initial)	Min. 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	
	Surge Strength between coil and contacts	1,500 V/10 × 700 μs		
Life	Mechanical	5 × 10 <sup>6</sup> ops. min.		
	Electrical (Refer to the REFERENCE DATA)	300 × 10 <sup>3</sup> ops. min. (at 1 A/ 28 VDC resistive load)		
		100 × 10 <sup>3</sup> ops. min. (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)	60 m/s <sup>2</sup> (11± <sup>1</sup> ms)
		Endurance	1,000 m/s <sup>2</sup> (11± <sup>1</sup> ms)	
	Unit Mass	Approx. 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 atmosphere. The minimum switching load varies with the switching frequency and operation environment.

# FBR210 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-P	FBR211NAD001-P	FBR211SBD001-P	FBR211NBD001-P	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-P	FBR211NAD003-P	FBR211SBD003-P	FBR211NBD003-P	3 VDC	20 Ω	150 mA					
FBR211SAD005-P	FBR211NAD005-P	FBR211SBD005-P	FBR211NBD005-P	5 VDC	56 Ω	89 mA					
FBR211SAD006-P	FBR211NAD006-P	FBR211SBD006-P	FBR211NBD006-P	6 VDC	80 Ω	75 mA					
FBR211SAD009-P	FBR211NAD009-P	FBR211SBD009-P	FBR211NBD009-P	9 VDC	180 Ω	50 mA					
FBR211SAD012-P	FBR211NAD012-P	FBR211SBD012-P	FBR211NBD012-P	12 VDC	320 Ω	38 mA					
FBR211SAD024-P	FBR211NAD024-P	FBR211SBD024-P	FBR211NBD024-P	24 VDC	1,280 Ω	19 mA					

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

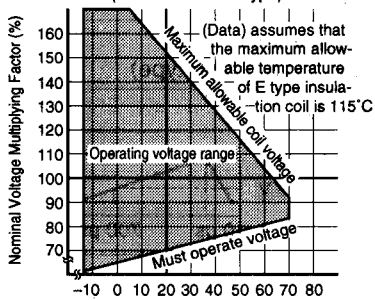
### 2. HIGH SENSITIVE (C or E type)

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

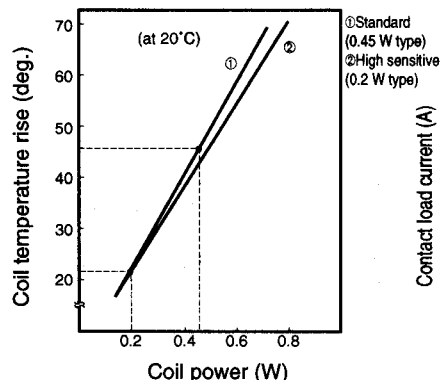
Note: All values in the table are measured at 20°C.

## CHARACTERISTIC DATA

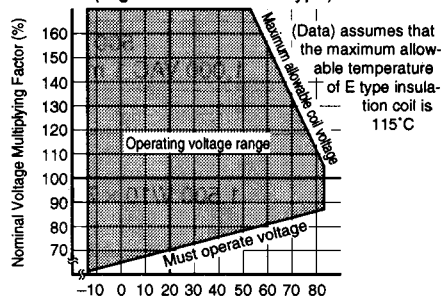
Range of operation temperature and voltage  
(Standard 0.45 W type)



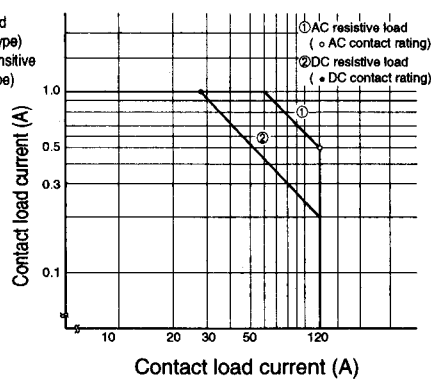
Operating temperature (°C)  
Coil temperature rise data



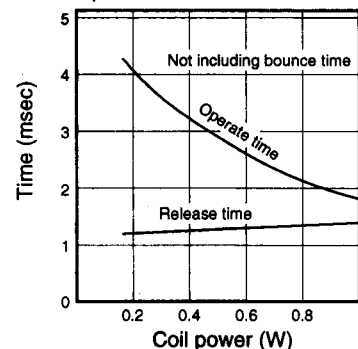
Range of operation temperature and voltage  
(High sensitive 0.2 W type)



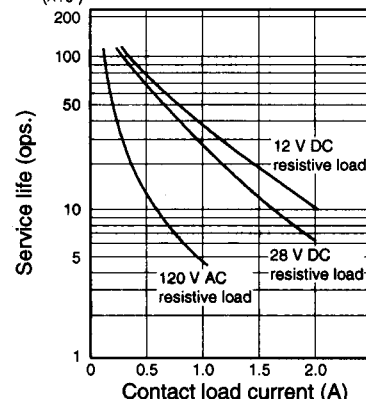
Operating temperature (°C)  
Maximum switching capacity



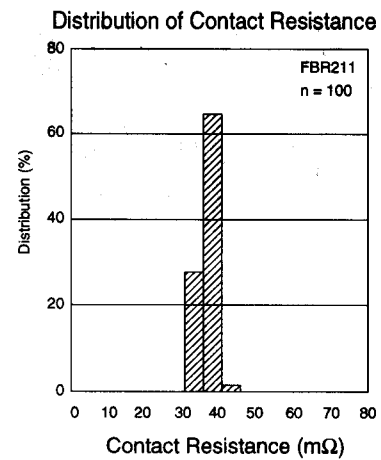
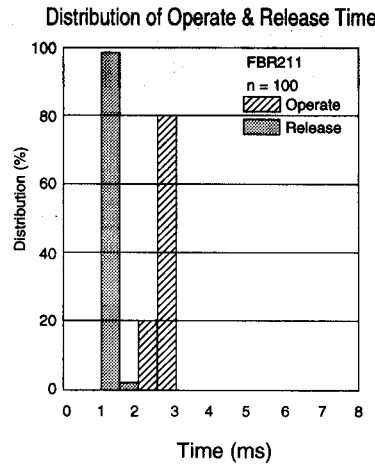
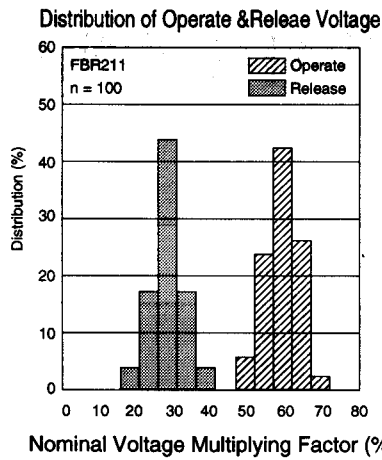
Operate & Release time data



Service life curve



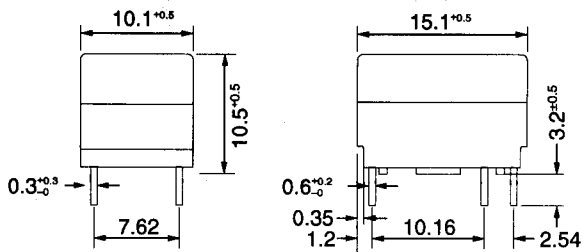
## REFERENCE DATA



## DIMENSIONS

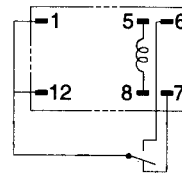
### 1. STANDARD (Flux Free Type)

●Dimensions

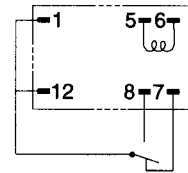


●Schematics (BOTTOM VIEW)

(A type or C type)

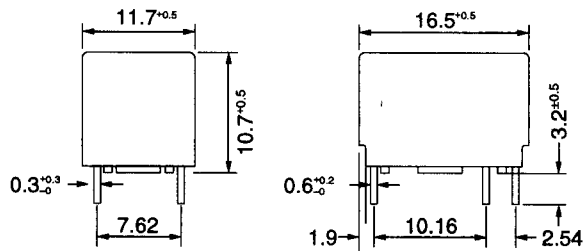


(B type or E type)



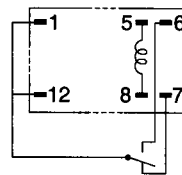
### 2. N-TYPE (Plastic Sealed Type)

●Dimensions

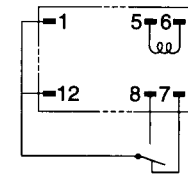


●Schematics (BOTTOM VIEW)

(A type or C type)

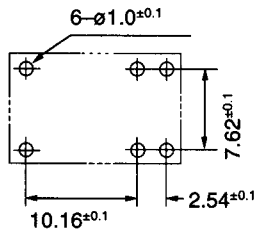


(B type or E type)



### 3. PC BOARD MOUNTING HOLE LAYOUT

●PC board mounting hole layout (BOTTOM VIEW)



Unit: mm