

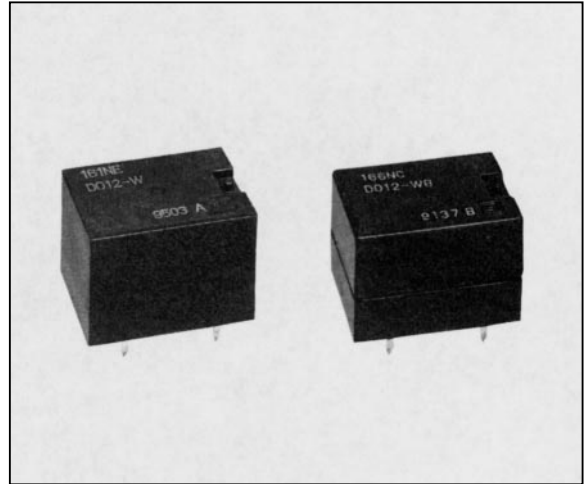
POWER RELAY

1 POLE-15 to 25 A (FOR AUTOMOTIVE APPLICATIONS)

FBR160, 166 SERIES

■ FEATURES

- Suitable for automotive applications of motor load controls, door lock, power window, wiper, etc.
- Variety of contact materials covering wide current switching in range of 15 A to 25 A (at 14 VDC) .
- FBR166 series with high conductive spring and improved break performance is also available.



■ ORDERING INFORMATION

- FBR160 Series

[Example] $\frac{\text{FBR161}}{\text{(a)}} \frac{\text{S}}{\text{(b)}} \frac{\text{E}}{\text{(c)}} \frac{\text{D012}}{\text{(d)}} - \frac{\text{W}}{\text{(e)}} \frac{\text{**}}{\text{(f)}}$

(a)	Series Name	FBR161: 1 form C FBR160 Series
(b)	Enclosure	S : Flux Free Type N : Plastic Sealed Type
(c)	Coil Type	E : Nominal power 0.36 W C : Nominal power 0.5 W
(d)	Nominal Voltage	D012 : 12 VDC (Example)
(e)	Contact Material	C : Silver Copper (15 A Max.) W : Silver-Tin oxide indium (20 A Max.) WB : Silver-Tin oxide indium (25 A Max.)
(f)	Custom Designation	To be assigned custom specification

- FBR166 Series

[Example] $\frac{\text{FBR166}}{\text{(a)}} \frac{\text{S}}{\text{(b)}} \frac{\text{CD009}}{\text{(c)}} - \frac{\text{WB}}{\text{(d)}} \frac{\text{**}}{\text{(e)}}$

(a)	Series Name	FBR166: 1 form C FBR166 Series
(b)	Enclosure	S : Flux Free Type N : Plastic Sealed Type
(c)	Nominal Voltage	CD009 : 9 VDC (Example)
(d)	Contact Material	WB : Silver-Tin oxide indium (25 A Max.)
(e)	Custom Designation	To be assigned custom specification

FBR160,166 SERIES

■ SPECIFICATIONS

Item		Specifications	
Contact	Arrangement	1 Form C (SPDT)	
	Material	C : Silver Copper (15 A Max.) W : Silver-Tin oxide indium (20 A Max.) WB: Silver-Tin oxide indium (25 A Max.)	
	Voltage Drop (Resistance)	Max. 100 mV (at 2 A 12 VDC)	
	Max. Carrying Current	Contact C and W type : 17 A/1 Hr., 5 A (Continuously) Contact WB type : 25 A/1 Hr., 10 A (Continuously)	
	Max. Switching Current	15 A 16 VDC (Silver Copper : C type) 20 A 16 VDC (Silver-Tin oxide indium : W type) 25 A 16 VDC (Silver-Tin oxide indium : WB type)	
Coil	Operating Temperature	-30°C ~ + 85°C (No frost) (Refer to the CHARACTERISTIC DATA)	
	Storage Temperature	-40°C ~ + 100°C (No frost)	
Time Value	Operate (at nominal voltage)	Max. 10 ms	
	Release (at nominal voltage)	Max. 5 ms	
Life	Mechanical	10 × 10 ⁶ ops. min.	
	Electrical	FBR160 Series: 100 × 10 ³ ops. min. FBR166 Series: 200 × 10 ³ ops. min. (14 VDC, Max. Switching Current, resistive load) (Refer to the CHARACTERISTIC DATA)	
Other	Vibration Resistance		10 to 55 Hz (double amplitude of 1.5 mm)
	Shock Resistance	Misoperation	100 m/s ² (11 ± ¹ ms)
		Endurance	1,000 m/s ² (11 ± ¹ ms)
	Unit Mass		Approx. 11 g

■ COIL RATINGS

MODEL		Nominal voltage	Coil resistance voltage ±10%	Must operate voltage (+20°C)	Must operate voltage (+80°C)	Operating Voltage (reference)	Nominal power	Contact material	Thermal Resistance
FBR161 Series	FBR161S (N) ED009-W32	9 VDC	210Ω	6.0 V	7.4 V	6.0 V-14.0 V	Approx. 380 mW	Silver tin indium oxide	84°C/W
	FBR161S ED009-W12	9 VDC	225Ω	6.5 V	8.0 V	6.5 V-14.0 V	Approx. 360 mW	Silver tin indium oxide	
	FBR161S (N) ED009-WB38	9 VDC	225Ω	6.5 V	8.0 V	6.5 V-16.0 V	Approx. 360 mW	Silver tin indium oxide	83°C/W
	FBR161S CD012-C36	12 VDC	320Ω	7.3 V	9.0 V	7.3 V-15.5 V	Approx. 450 mW	Silver copper	78°C/W
	FBR161S CD012-W36	12 VDC	320Ω	7.3 V	9.0 V	7.3 V-15.0 V	Approx. 450 mW	Silver tin indium oxide	
	FBR161S CD012-W31	12 VDC	290Ω	7.3 V	9.0 V	7.3 V-15.5 V	Approx. 500 mW	Silver tin indium oxide	76°C/W
FBR166 Series	FBR166S (N) CD009-WB	9 VDC	120Ω	6.3 V	7.8 V	6.3 V-14.0 V	Approx. 670 mW	Silver tin indium oxide	67°C/W
	FBR166S (N) CD012-WB	12 VDC	210Ω	7.3 V	9.0 V	7.3 V-14.0 V	Approx. 680 mW	Silver tin indium oxide	

FBR160,166 SERIES

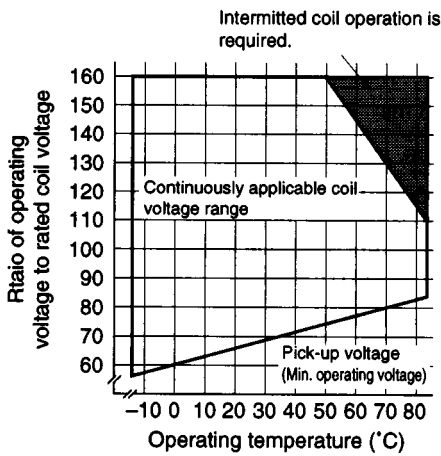
CHARACTERISTIC DATA

1. SERVICE LIFE WITH ACTUAL MOTOR LOAD TEST (Example)

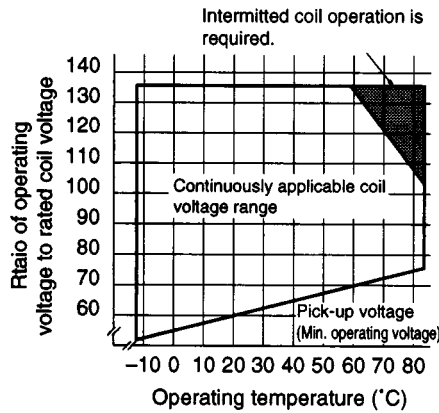
- Wiper motor (Free, 16 VDC inrush 20 A, Break 2 A) : more than 300,000 ops. (FBR160-W, Silver tin oxide alloy)
- Wiper motor (Free, 14 VDC inrush 25 A, Break 5 A) : more than 500,000 ops. (FBR160-WB, Silver tin oxide alloy)
- Door lock motor (Stall, 14 VDC inrush -25 A) : more than 100,000 ops. (FBR160-W, Silver tin oxide alloy)
- Door lock motor (Stall, 14 VDC inrush -25 A) : more than 200,000 ops. (FBR166)

2. OPERATING COIL VOLTAGE (Example)

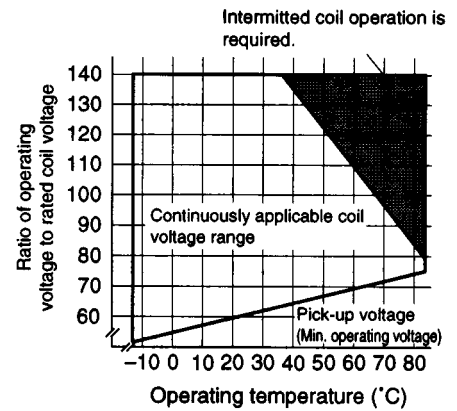
[FBR161S(N)ED009-W32,
Approx. 380 mW type]



[FBR161SCD012-W36,
Approx. 450 mW type]

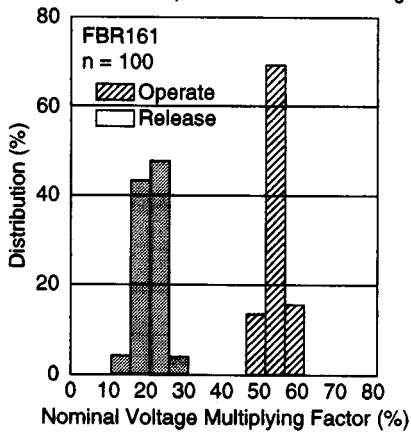


[FBR166S (N) D012-WB,
Approx 680 mW type]

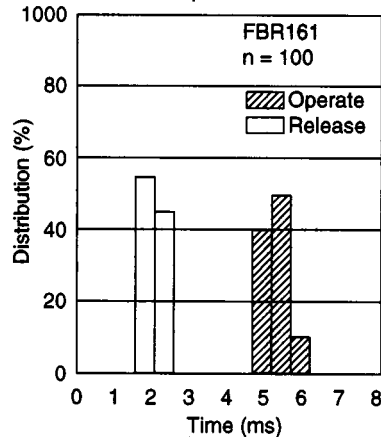


REFERENCE DATA

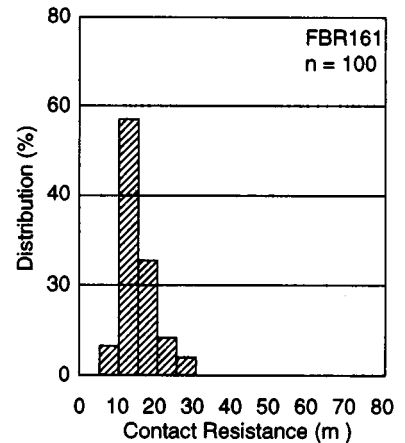
Distribution of Operate & Release Voltage



Distribution of Operate & Release Time

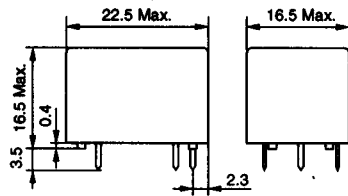


Distribution of Contact Resistance

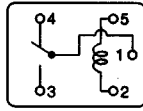


■ DIMENSIONS

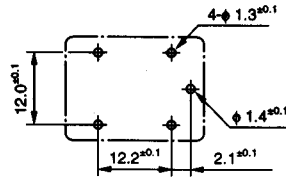
● Dimensions



● Schematics (BOTTOM VIEW)



● PC board mounting hole layout (BOTTOM VIEW)



Unit: mm