FUJITSU THE POSSIBILITIES ARE INFINITE

COMPACT POWER RELAY

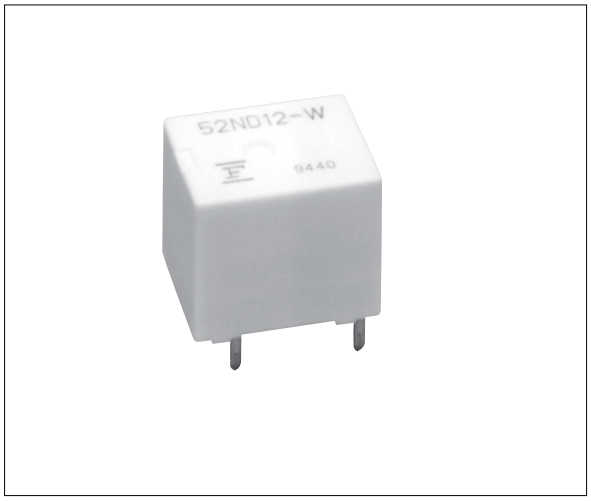
1 POLE—30 A

(FOR AUTOMOTIVE APPLICATIONS)

FBR51, 52 SERIES

■ FEATURES

- Compact and lightweight structure
  (42% of the volume of the FBR160 relay)
- High current contact capacity
  (carrying current: 35 A/10 minutes, 25 A/1 hour)
- High resistance to vibration and shock
- Improved heat resistance and extended operation range
- Two contact gap options
  (FBR51: 0.3 mm, FBR52: 0.6 mm)
- Three types of contact material



■ ORDERING INFORMATION

[Example] FBR51 (a) N (b) D12 (c) – W1 (d) ** (e)

(a)	Series Name	FBR51 : Standard type (contact gap 0.3 mm) FBR52 : Wider contact gap type (contact gap 0.6 mm)
(b)	Enclosure	N : Plastic sealed type
(c)	Nominal Voltage	D06 : 6 VDC D09 : 9 VDC D10 : 10 VDC D12 : 12 VDC
(d)	Contact Material	W1 : Silver-tin oxide indium (high power type) WL : Silver-tin oxide indium (lamp loads, see applications table) WF : Silver-tin oxide indium (flasher loads)
(e)	Custom Designation	To be assigned custom specification

■ SPECIFICATIONS

Item			Specifications		
			W1 contact	WL contact	WF contact
Contact	Arrangement		1 form C	1 form A (SPST)	1 form A (SPST)
	Material		Silver-tin oxide indium (high power type)	Silver-tin oxide indium	Silver-tin oxide indium
	Voltage Drop (resistance)		Maximum 100mV (at 1A 12 VDC)		
	Rating		14 VDC 25 A (motor free load)	120 Watt lamp at 14 VDC	80 Watt lamp at 14 VDC
	Maximum Carrying Current		35A / 10 minuntes, 10A / 1hr (25°C, 100% rated coil voltage)		
	Maximum Inrush Current (reference)		60 A	80 A	
	Max. Switching Current (reference)		35 A 16 VDC		
	Min. Switching Load*1 (reference)		6 VDC 1A		
Coil	Operating Temperature Range		-40˚C to +85˚C (no frost)		
	Storage Temperature Range		-40˚C to +100˚C (no frost)		
Time Value	Operate (at nominal voltage)		Maximum 10ms		
	Release (at nominal voltage)		Maximum 5mx		
Life	Mechanical		10 x 10^6 operations minimum		
	Electrical		2 x 10^5 ops min. 14 VDC 25A Locked motor load	1.0 x 10^5 ops min. 115 Watts lamp, 14 VDC	2.5 x 10^6 ops min. Inrush 11A 14VDC (0.35 sec - ON / 0.35 sec - OFF)
Other	Vibrations Resistance		10 to 55 Hz (double amplitude of 1.5mm)		
	Shock Resistance	Misoperation	10m/s^2		
		Endurance	1,000 m/s^2		
	Weight		Approximately 6g		

*1 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 operating environment.

■ COIL DATA CHART

1. FBR51 Series

Model			Nominal Voltage	Coil resistance (±10%) (at 20ºC)	Must operate voltage	Thermal resistance
W 1 contact	WL Contact	WF contact				
FBR51ND06-W1	FBR51ND06-WL	FBR51ND06-WF	6 VDC	60	3.6VDC (at 20ºC) 4.5VDC (at 80ºC)	73ºC/W
FBR51ND09-W1	FBR51ND09-WL	FBR51ND09-WF	9 VDC	135	5.4VDC (at 20ºC) 6.8VDC (at 80ºC)	
FBR51ND10-W1	FBR51ND10-WL	FBR51ND10-WF	10 VDC	180	6.3VDC (at 20ºC) 7.9VDC (at 80ºC)	
FBR51ND12-W1	FBR51ND12-WL	FBR51ND12-WF	12 VDC	240	7.3VDC (at 20ºC) 9.2VDC (at 80ºC)	

2. FBR52 Series

MODEL W1 contact	Nominal voltage	Coil resistance (±10%) (at 20°C)	Must operate voltage	Thermal resistance
FBR52ND06-W1	6 VDC	45 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	65°C/W
FBR52ND09-W1	9 VDC	100 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR52ND10-W1	10 VDC	135 Ω	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR52ND12-W1	12 VDC	180 Ω	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

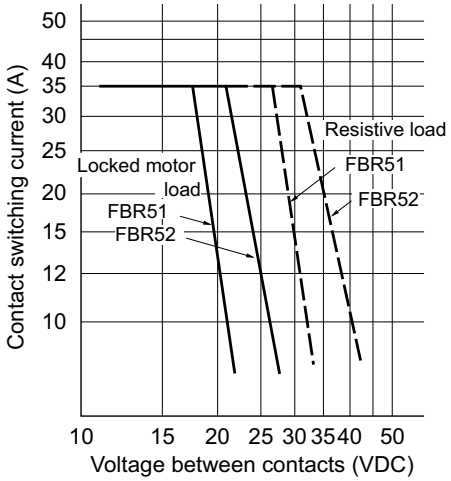
■ SUITABLE APPLICATIONS

Application	Normal load current (12 VDC system)	Description	Recommended model (example)	
			For 16 V or less motor load voltage	For instantaneous 20 V or more load voltage
Power Windows	20 to 25 A (switching at motor locking)	forward and reverse motor control	FBR51N□ -W1	FBR52N□ -W1
Automatic Door Lock	18 to 25 A (switching at motor locking)	forward and reverse motor control	FBR51N□ -W1	FBR52N□ -W1
Tilt-Lock Wheel	20 A (switching at motor locking)	forward and reverse motor control	FBR51N⋒ -W1	FBR52N⋒ -W1
Sunroof	20 to 30 A (switching at motor locking)	forward and reverse motor control	FBR51N □ -W1	FBR52N □ -W1
Adjustable Door Mirror	3 to 5 A (switching at motor locking)	forward and reverse motor control	FBR51N □ -W1	
Automatic Antenna	8 to 12 A (INRUSH) break 2 A maximum (motor-free)	forward and reverse motor control	FBR51N□ -W1	
Auto-Cruise	2 to 3 A	power shutoff and solenoid	FBR51N□-W1	
Lamp loads	120 Watts	for up to 100K operations	FBR51N□-WL	
Others	Car Audio System, etc.		FBR51N□-W1	

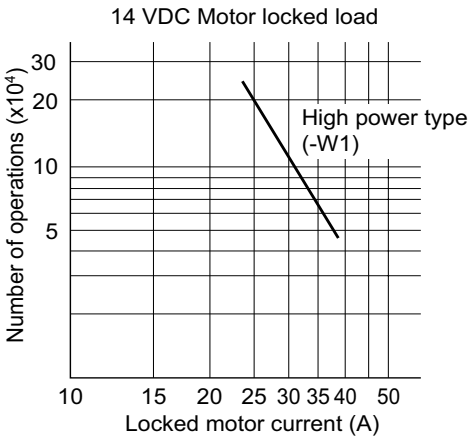
- For the load condition where higher voltage would be encountered during contact break, FBR52 series with wider contact gap is recommended.

■ CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



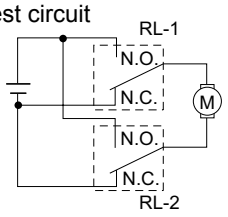
2. LIFE



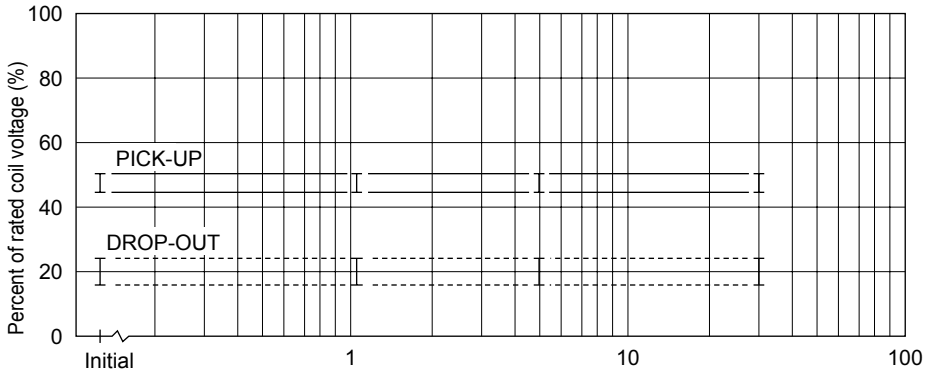
3. LIFE TEST (EXAMPLE)

• Test item
14 V DC-20 A
motor lock 200,000
operations minimum
(FBR52□-W1 type)

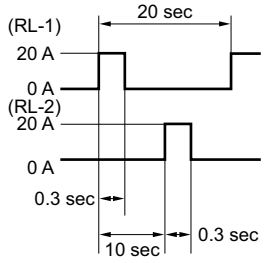
• Test circuit



• Shift of pick-up drop-out voltage

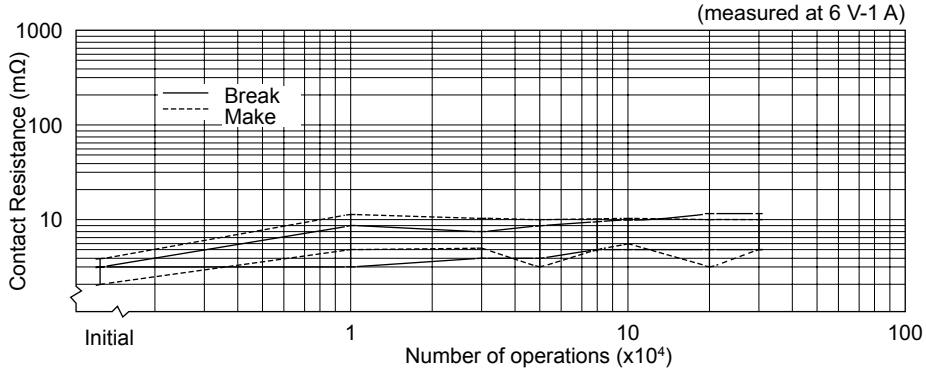


• Current wave form



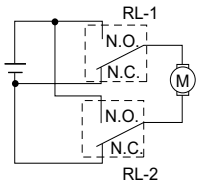
• Shift of contact resistance

(measured at 6 V-1 A)

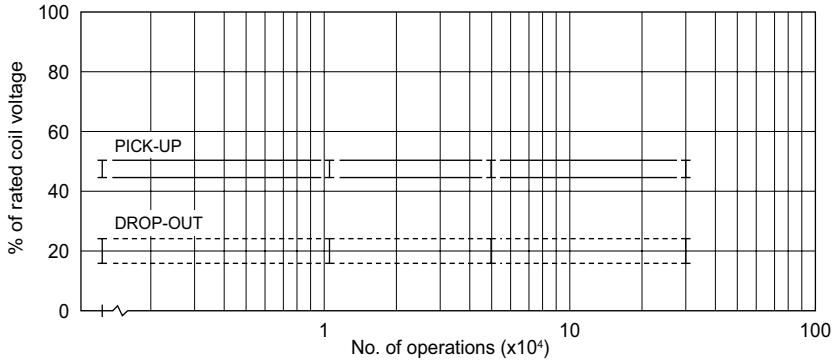


• Test item
14 V DC-25 A
Motor lock
200,000 operations minimum
(FBR51 □-W1 type)

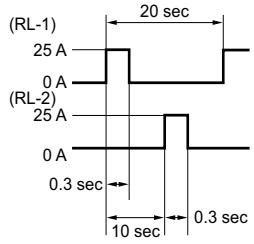
• Test circuit



• Shift of pick-up and drop-out voltage

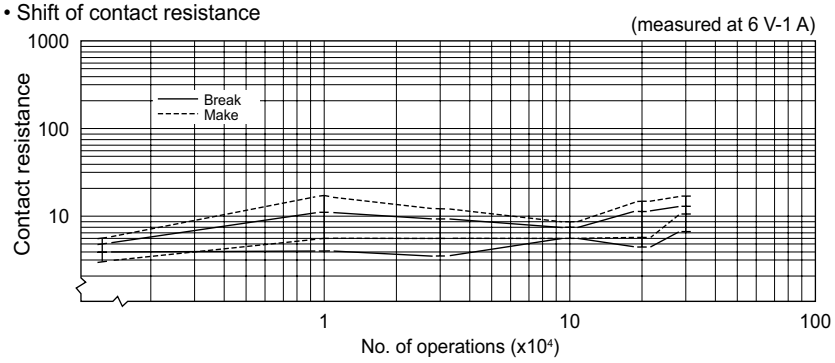


• Current wave form



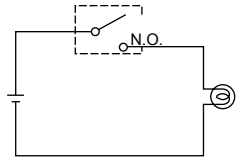
• Shift of contact resistance

(measured at 6 V-1 A)

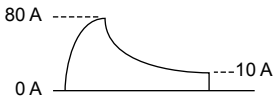


• Test item
14 V DC-80 A (120W) lamp load 100,000 operations minimum (FBR51⊓-WL type)

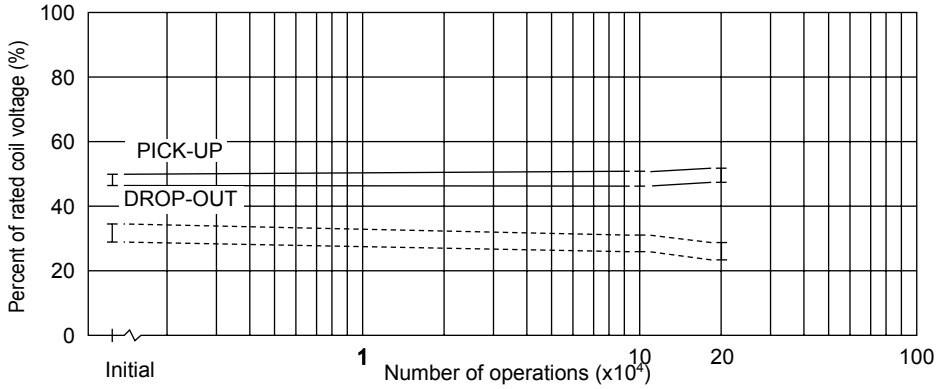
• Test circuit



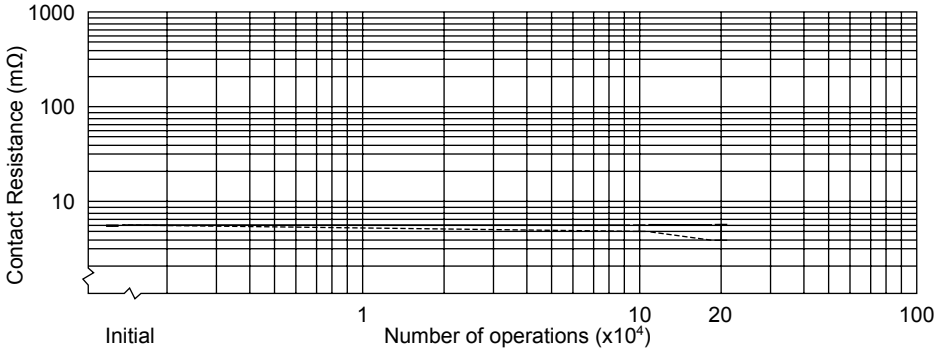
• Current wave form



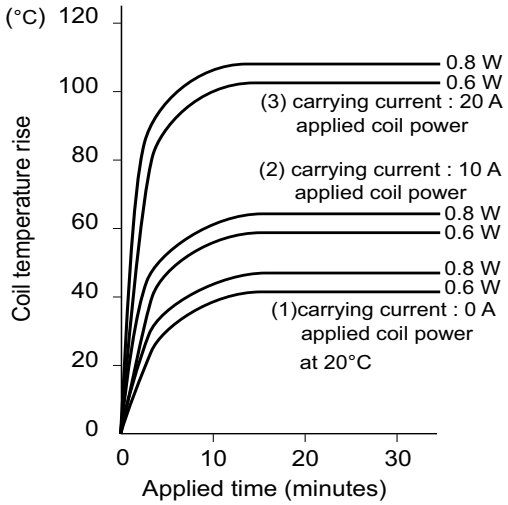
• Shift of pick-up drop-out voltage



• Shift of contact resistance

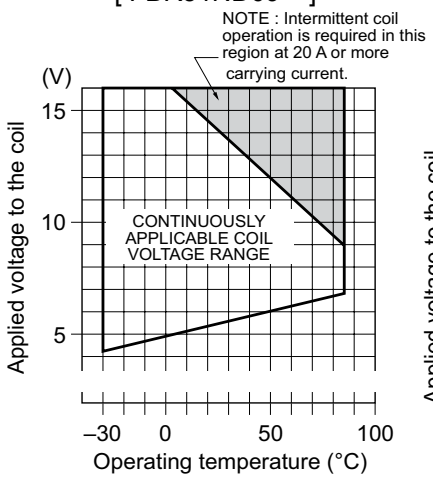


4. COIL TEMPERATURE RISE

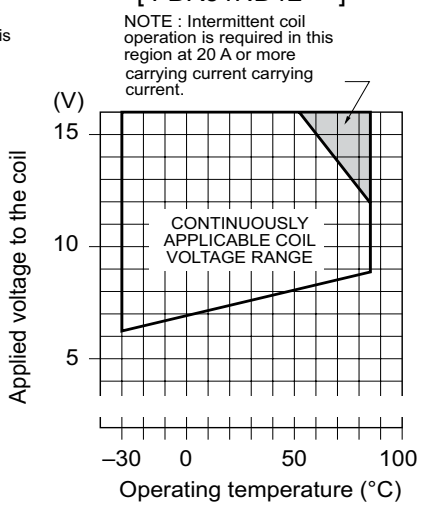


5. OPERATING COIL VOLATGE RANGE (EXAMPLE)

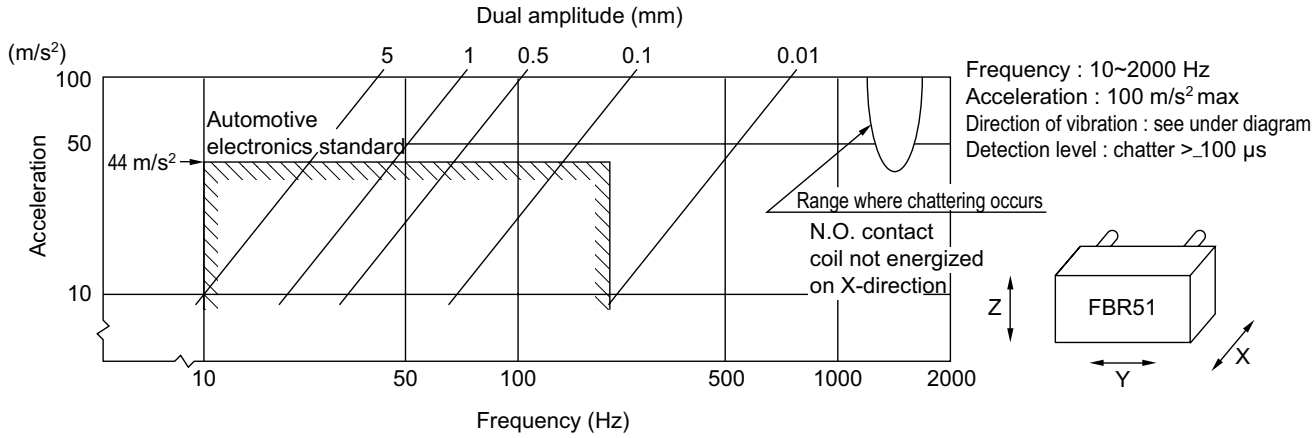
[FBR51ND09-□]



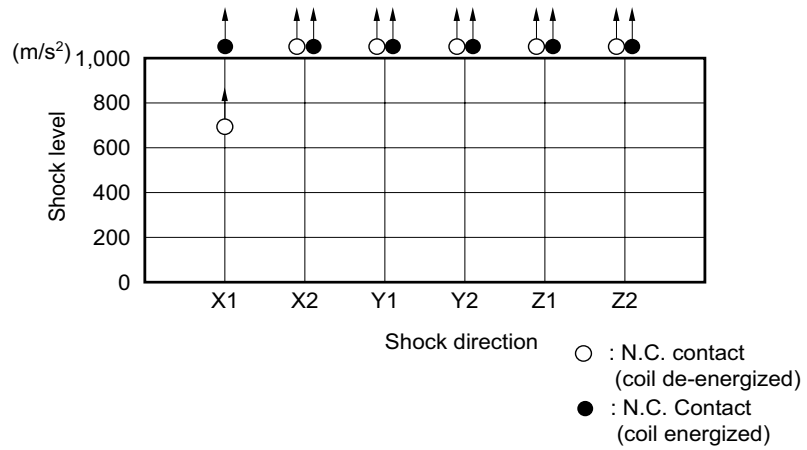
[FBR51ND12-□]



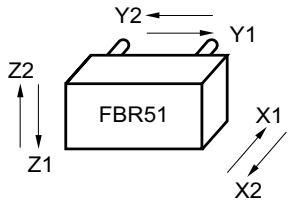
6. VIBRATION RESISTANCE CHARACTERISTICS



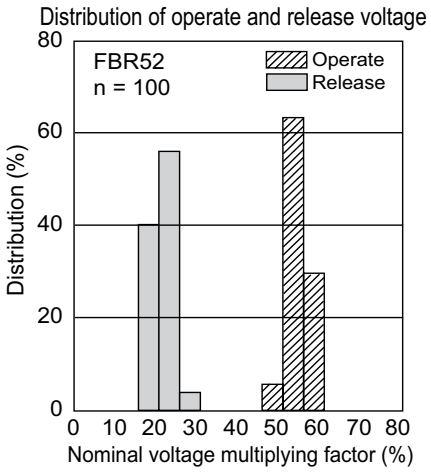
7. SHOCK RESISTANCE CHARACTERISTICS

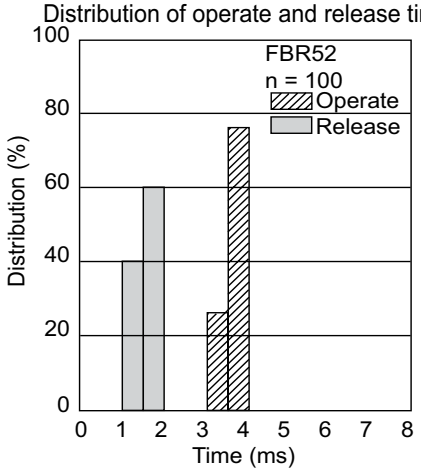


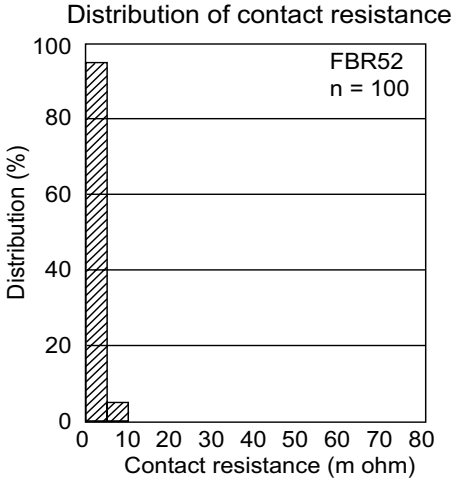
Shock application time : 11 ms, half-sine wave
Test material : coil, energized and de-energized
Shock direction : set under diagram
Detection level : chatter ≥ 100 µs



■ REFERENCE DATA

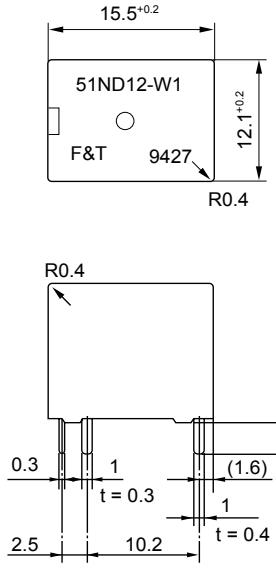




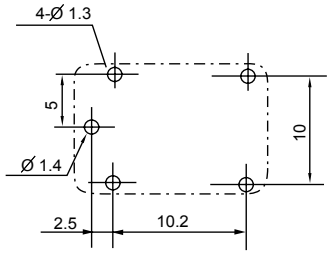


■ DIMENSIONS

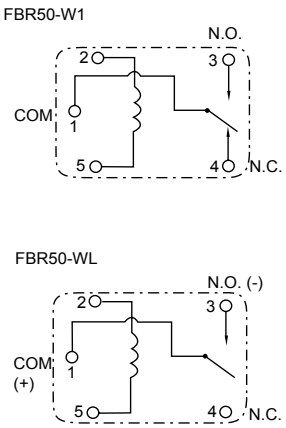
● Dimensions



● PC board mounting hole layout (BOTTOM VIEW)

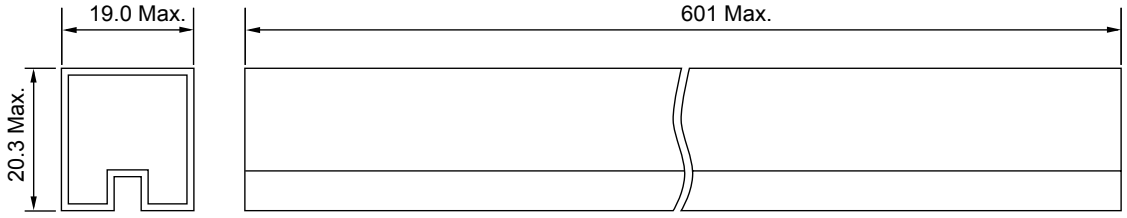


● Schematics (BOTTOM VIEW)



Refer to the test circuit at CHARACTERISTIC DATA for connection, and polarity.

● Tube carrier



45 pcs/tube

Unit : mm

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