FUJITSU

COMPACT HIGH POWER RELAY

1 POLE - 40A (For Automotive Applications)

FBR53-HW Series

■ FEATURES

- Small 40A relay
- High temperature grade (-40˚C to 125˚C)
- Contact arrangement Form U (form A)
- Surface mount compatible (reflow capability)
- Inrush current 80A
- Coil wire temperature class: H

■ PARTNUMBER INFORMATION

	FBR53	N	D12	- Y	- HW
[Example]	(a)	(b)	(c)	(d)	(e)

(a)	Relay type	FBR53 : FBR53 Series
(b)	Enclosure	N : Plastic sealed
(c)	Coil rated voltage	D12 : 9....12VDC Coil rating table at page 3
(d)	Contact material	Y : Silver-tin oxide
(e)	Contact rating	HW : 40A

Actual marking does not carry the type name: "FBR"
E.g.: Ordering code: FBR53ND12-Y-HW Actual marking: 53ND12-Y-HW

■ SPECIFICATION

Item			FBR53-HW
Contact Data	Configuration		Form U
	Material		Silver-tin oxide ($AgSnO_2$)
	Voltage drop		Max. 100 mV at 1A, at 12V open contact voltage Average 1.2mΩ at 7A, 12VDC
	Contact rating		40A , 14VDC (resistive load)
	Max. carrying current		40A
	Max. inrush current		80A inrush
	Min. switching load *		6 VDC, 1A
Life	Mechanical		Min. 10 x 10^6 operations (without contact load)
	Electrical		Min. 100 x 10^3 operations (14VDC, 20A resistive load)
Coil Data	Rated power		860 mW
	Operate power		310 mW
	Operating temperature range		-40 °C to +125 °C (no frost)
	Coil wire temperature class		H
Timing Data	Operate (at nominal voltage)		Max. 10 ms
	Release (at nominal voltage)		Max. 10 ms (no diode)
Insulation	Resistance (initial)		Min. 100 M Ω
	Dielectric strength	Open contacts	500 VAC (50/60 Hz) 1min.
		Contacts to coil	500 VAC (50/60 Hz) 1min.
Other	Vibration resistance	Misoperation	10 to 55Hz double amplitude 1.5mm, direction X, Y, Z
		Endurance	10 to 100Hz double amplitude 1.5mm, direction X, Y, Z No damage (mechanical and electrical) after test. Coil energizing: 1 hr each direction, Coil not energized: 1 hr each direction
	Shock	Misoperation	100m/s² (11ms), direction X, Y, Z
		Endurance	1,000m/s² (11ms), direction X, Y, Z, each 6 shocks No damage (mechanical and electrical) after test. Coil energizing: 3 shocks Coil not energized: 3 shocks, total 36 shocks
	Terminal	Solderability	At 270 ± 10°C for 3 ± 0.5sec.
		Strength	9.8N (1 Kgf) Pull force, longitudinal during 10 sec.
	Weight		Approximately 6 g
	Sealing		Plastic sealed cat III

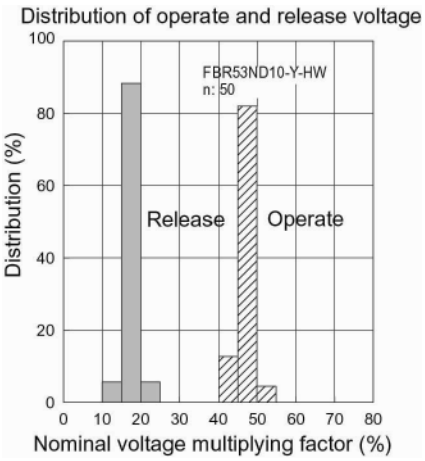
* Minimum switching loads mentioned above are reference values. Please perform the confirmation test with actual load before production since reference values may vary according to switching frequencies, environmental contions and expected reliability levels.

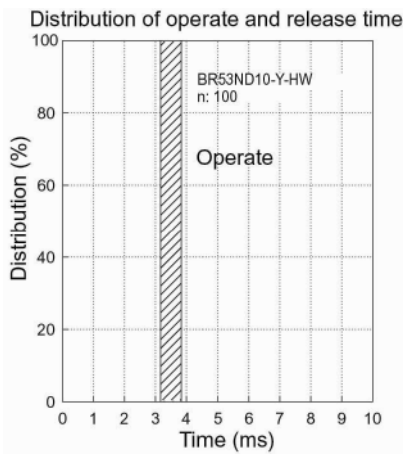
■ COIL RATING

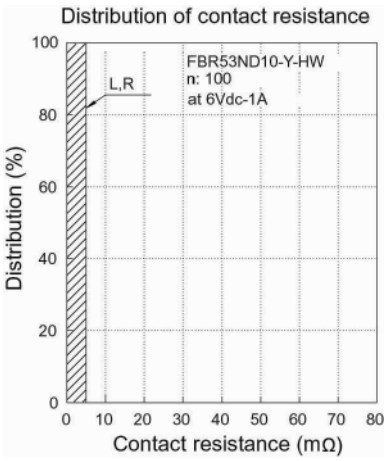
Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *
D09	9	94	5.4	0.7
			7.7 (at 125 °C)	1.0 (at 125 °C)
D10	10	177	6.3	0.8
			9 (at 125 °C)	1.2 (at 125 °C)
D12	12	167	7.3	1.0
			10.4 (at 125 °C)	1.5 (at 125 °C)

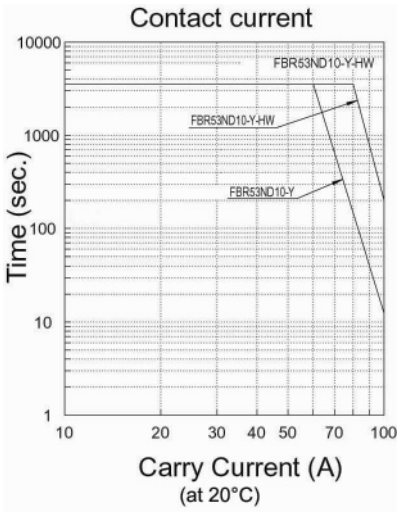
Note: All values in the table are valid for 20°C and zero contact current, unless otherwise indicated.
* Specified operate values are valid for pulse wave voltage.

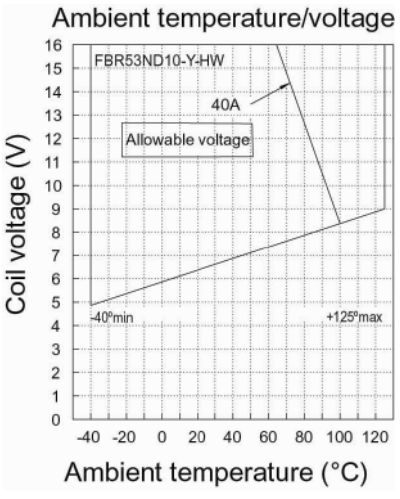
■ REFERENCE DATA

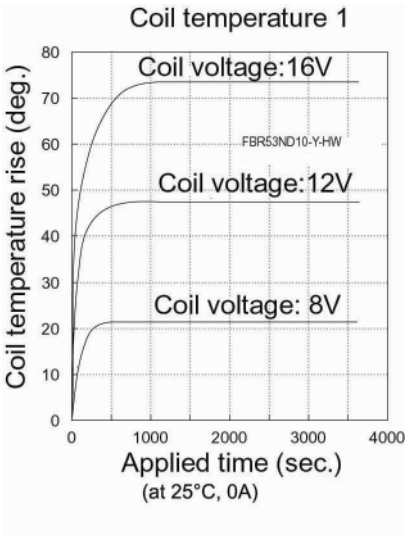


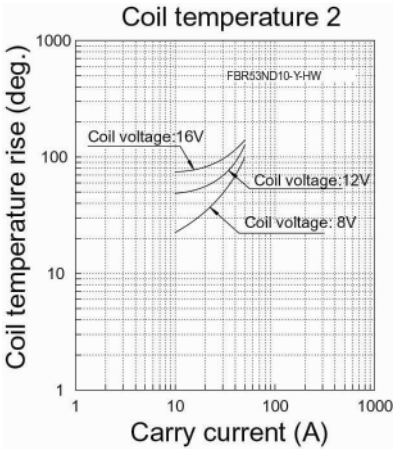


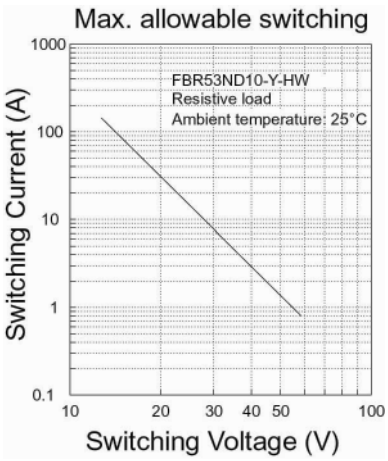






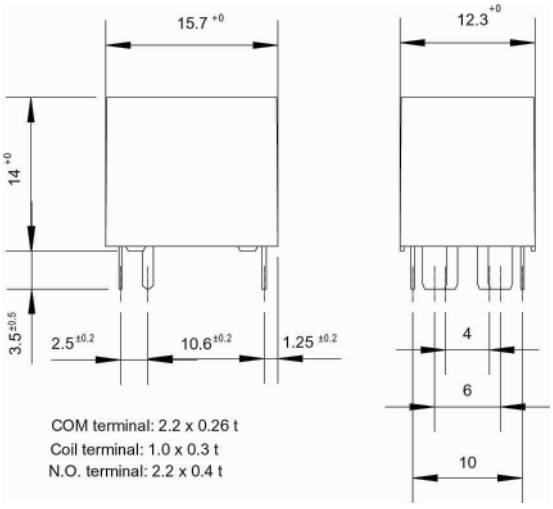




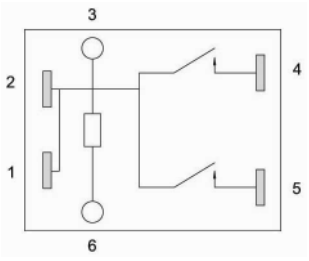


■ DIMENSIONS

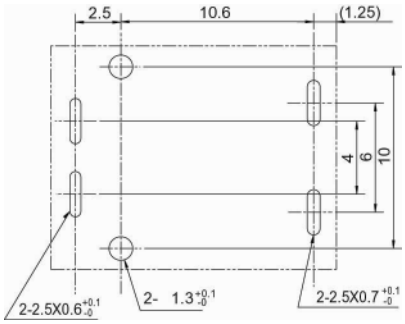
- **Dimensions**



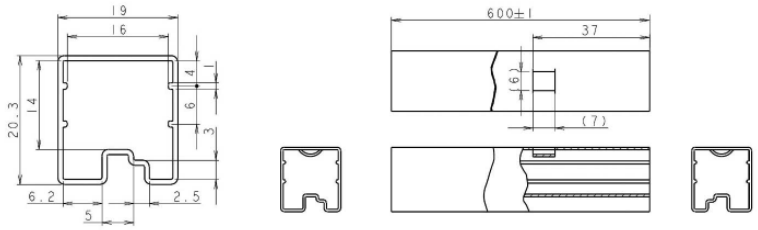
- Schematics
(BOTTOM VIEW)



- **Mounting hole layout**
(BOTTOM VIEW)



- **Tube dimensions**



Unit: mm

RoHS Compliance and Lead Free Information

1. General Information

- All automotive relays produced by Fujitsu Components are compliant with RoHS directive 2002/95EC including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives on October 21st, 2005. (Amendment to Directive 2002/95/EC)
- All our automotive relays are lead-free.
- Lead free solder plating on relay terminals is Sn-3.0Ag-0.5Cu, unless otherwise specified. This material has been verified to be compatible with PbSn assembly process.

2. Recommended Lead Free Solder Profile

- Recommended solder Sn-3.0Ag-0.5Cu.

Flow Solder condition:

Pre-heating:	maximum 120˚C
Soldering:	dip within 5 sec. at 260˚C solder 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 through hole mounted electromechanical relays, unless otherwise indicated.

4. Tin Whiskers

- Dipped SnAgCu solder is known as presenting a low risk to tin whisker development. No considerable length whisker was found by our in house test.

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