Preliminary

FUJITSU

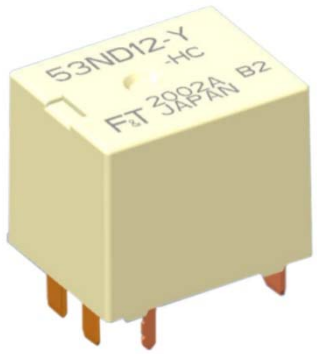
AUTOMOTIVE RELAY
1 POLE – 50A

FBR53-HC Series

RoHS Compliant

■ FEATURES

- 1 pole 50A, 1U contact
- Compact for high density packaging
- High temperature grade (-40℃ to 125℃)
- Low coil power approx. 0.6W
- This relay is able to replace the Mini ISO relay
- Reflow capable (through hole reflow) type available
- Plastic sealed



■ APPLICATIONS

Electric Power Steering, blower fan motor control, starter

■ PART NUMBERS

[Example] FBR53 N D12 - Y - HC - RW
(a) (b) (c) (d) (e) (f)

(a)	Relay type	FBR53	: FBR53 series
(b)	Enclosure	N	: Plastic sealed type
(c)	Coil rated voltage	D12	: 12VDC
(d)	Contact material	Y	: Silver tin oxide
(e)	Contact rating	HC	: 50A
(f)	Soldering	Nil RW	: Standard (Flow soldering) : Reflow capable (THR)

Note: Actual marking does not carry the type name: "FBR".
E.g.: Ordering code: FBR53ND12-Y-HC, actual marking: 53ND012-Y-HC

■ SPECIFICATIONS

Item			Specifications	Remarks / Conditions
Contact Data	Configuration		1 form U	
	Material		Silver tin oxide	
	Construction		Single	
	Voltage drop		Max. 100mV	At 1A 12VDC
	Contact rating		N.O.: 50A 14VDC	Resistive load
	Max. carrying current		N.O.: 67.5A 14VDC, 30 minutes	At 20°C
	Max. inrush current		100A	Reference
	Min. switching load		1A 12VDC	Reference*1
Coil	Rated power consumption		600mW	At rated coil voltage, at 20°C
	Operate coil power		222mW	At operate voltage, at 20°C
	Operating temperature range		-40°C to +125°C*2	
Time	Operate		Max. 10ms	At rated coil voltage, without bounce
	Release		Max. 5ms	At rated coil voltage, without bounce
Life	Mechanical		Min. 1 x 10^6 operations	
	Electrical		Min. 100 x 10^3 operations	14VDC, resistive load 50A
Insulation	Insulation resistance		Min. 100MΩ	At 500VDC initial
	Dielectric withstanding voltage	Open contacts	500VAC (50/60Hz), 1 minute	Initial
		Coil-contact	500VAC (50/60Hz), 1 minute	Initial
Others	Vibration resistance	Misoperation	10 to 200Hz, acceleration 44m/s^2 (4.5G) constant acceleration	Direction X, Y, Z, coil ON/OFF total 6 cycles
		Endurance	10 to 200Hz, acceleration 44m/s^2 (4.5G) constant acceleration	Direction X, Y, Z, coil OFF total 6 hours
	Shock resistance	Misoperation	100m/s^2 (11±1ms)	Direction X, Y, Z, coil ON/FF total 36 times
		Endurance	1,000m/s^2 (6±1ms)	Direction X, Y, Z, coil OFF total 18 times
	Dimensions / weight		12.1 x 15.5 x 13.7 mm / Approx. 6g	

*1: 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 conditions and expected reliability levels.
*2: Relays shall be kept frost-free.
! Care shall be taken on the heat generated on PC board when maximum carrying current exceed 10A.

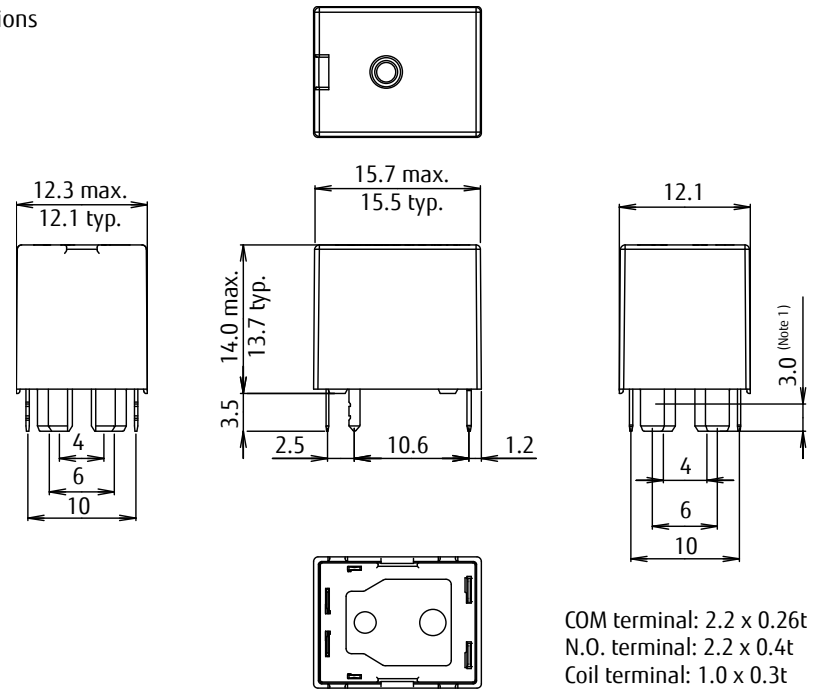
■ COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (VDC)	Nominal Power (mW)
D12	12	240	7.3 (at 20°C) 10.4 (at 125°C)	1.0 (at 20°C) 1.5 (at 125°C)	Approx. 600

Note: All values in the table are valid at 20°C and zero contact current unless otherwise specified.
Note: Please use at rated coil voltage.
*: Specified operate values are valid for pulse wave voltage.

■ DIMENSIONS

● Dimensions



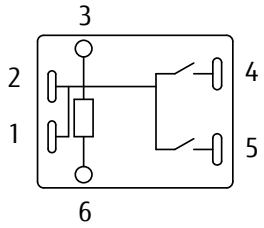
COM terminal: 2.2 x 0.26t
N.O. terminal: 2.2 x 0.4t
Coil terminal: 1.0 x 0.3t

Note 1: Avoid adhesion of sealing material from the terminals.
Note 2: Do not bent teminals.

Unit: mm

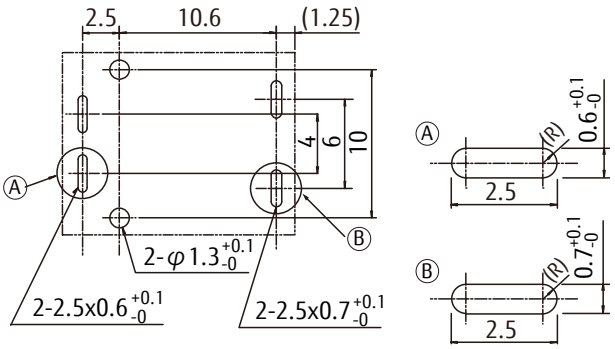
- Dimensions of the terminals do not include thickness of pre-solder.
- Dimensions do not include tolerances.

● Schematics (BOTTOM VIEW)



- Pattern shall be designed to short-circuit #4 and #5 on the PC board.

● PC Board Mounting Hole Layout (BOTTOM VIEW)



Unit: mm

CAUTIONS

- All values mentioned in this datasheet are provided under ideal conditions. Please perform the confirmation test before actual use.
- Reflow soldering is prohibited for flow soldering type.
- Do not use relays in the atmosphere with sulfide gas, chloride gas or nitric oxide. Contact resistance may increase.
- Do not use silicon or silicon-containing product or materials near relays. It may cause contact failure.

GENERAL INFORMATION

1. ROHS Compliance

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU, including commission delegated directive 2015/863.

2. Recommended lead free solder condition

- 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.
- Recommended solder for assembly: Sn-3.0Ag-0.5Cu.

Flow Solder Condition:

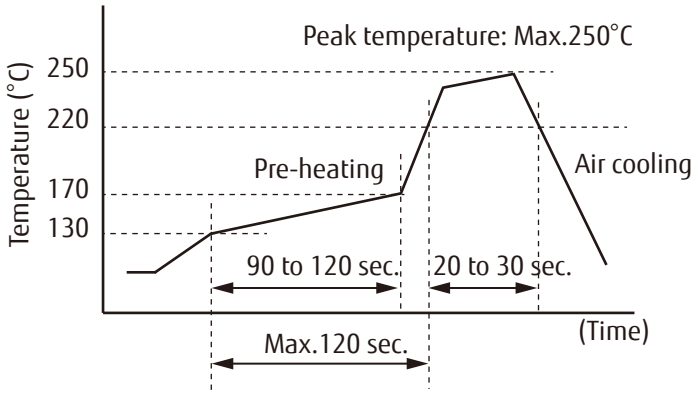
Pre-Heating: maximum 120˚C within 90 sec.
Soldering: dip within 5 sec. at 255℃±5℃ solder bath
Relay must be cooled by air immediately after soldering

Solder by Soldering Iron:

Soldering Iron: 30-60W
Temperature: maximum 340-360˚C
Duration: maximum 3 sec.

Refow Solder Condition:

(Applicable only for reflow capable type)
Recommended reflow soldering profile
IRS (infrated reflow soldering)



We highly recommend that you confirm your actual solder conditions

3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to 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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