

COMPACT HIGH POWER RELAY

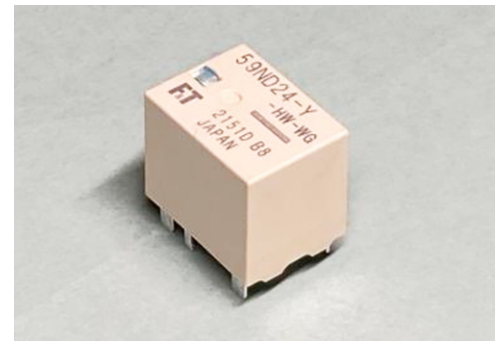
For automotive applications

1 POLE - 30A (For 24V Car Battery)

FBR59-HW Series

■ FEATURES

- 1 pole, 1 form U, switching current 30A, carrying current 70A
- Compact and high capacity for 24V battery car
- High temperature grade (-40°C to 125°C)
- Compared capability with Power Mini ISO plug-in relay
 - Smaller mounting area and low profile compare with Mini ISO relays
- Wide contact gap (0.8mm)
- Through hole reflow type available
- RoHS compliant, lead free



■ APPLICATIONS

Smart junction boxes, horn, lamp, heater, battery disconnection, chain saw, lawn mower, snow blower etc.

■ Part Numbers

[Example] FBR59 N D24 - Y - HW - WG - RW
(a) (b) (c) (d) (e) (f) (g)

(a)	Relay type	FBR59 : FBR59 series
(b)	Enclosure	N : Plastic sealed type
(c)	Coil rated voltage	D24 : 12, 24VDC Coil rating table at page 3
(d)	Contact material	Y : Silver-tin oxide
(e)	Contact rating	HW : 30A
(f)	Special type	WG : Wide contact gap (for 24VDC car battery)
(f)	Soldering	Nil : Standard RW : Through hole reflow (THR)

Actual markings does not carry the type name: "FBR"

E.g.: Ordering code: FBR59ND24-Y-HW Actual marking: 59ND24-Y-HW

FBR59-HW Series

■ Specifications

Item			FBR59-HW	Remarks / conditions
Contact data	Configuration		1 form U	
	Construction		Single	
	Material		Silver-tin oxide	
	Voltage drop		Max. 100 mV	At 1A, 12VDC
	Contact rating		30A, 28VDC	Resistive load
	Max. carrying current		70A/1h at 20°C 50A/1h at 85°C 30A/1h at 125°C	At rated load
	Min. switching load *		1A 6VDC	Reference
	Max. switching load		30A, 28VDC	Resistive load
Coil	Operating temperature range		-40°C ~ +125°C	No frost
Timing data	Operate		Max. 10ms	At nominal voltage (without diode, without bounce)
	Release		Max. 5ms	At nominal voltage (without diode, without bounce)
Life	Mechanical		Min. 1 x 10 ⁶ operations	
	Electrical		Min. 100 x 10 ³ operations	20A 28VDC, resistive load
Insulation	Insulation resistance		Min. 100MΩ at 500VDC	Initial
	Dielectric withstanding voltage	Open contacts	500VAC (50/60Hz), 1 minute	
		Coil contact	500VAC (50/60Hz), 1 minute	
Other	Vibration resistance	Misoperation	10 to 200Hz, 44m/s ² (4.5G), constant acceleration	
		Endurance	10 to 200Hz, 44m/s ² (4.5G), constant acceleration	
	Shock resistance	Misoperation	Min. 100m/s ² (11 ± 1ms)	
		Endurance	Min. 1,000m/s ² (6 ± 1ms)	
	Dimensions / weight		15.0 x 20.0 x 16.8 mm / approx. 13g	

* : 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.

Note: Values of electrical characteristics are under 15 to 35°C, 25 to 75%RH (JIS standard condition) unless otherwise specified.

Note: Care shall be taken on the heat generated on PC board when maximum carrying current exceeds 10A.

Please perform the confirmation test with actual conditions.

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Coil Data

Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ω)	Must Operate voltage* (VDC)	Must Release voltage* (VDC)
D12	12	123	7.3 (at 20°C) 10.3 (at 125°C)	1.0 (at 20°C) 1.4 (at 125°C)
D24	24	490	14.4 (at 20°C) 20.3 (at 125°C)	1.9 (at 20°C) 2.7 (at 125°C)

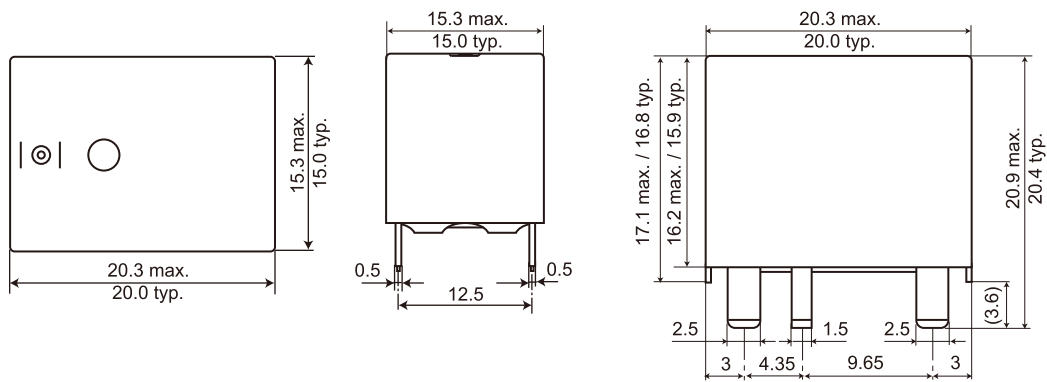
Note: All values in the table are valid at 20°C and zero contact current, unless otherwise specified.

* : Specified operated values are valid for pulse wave voltage.

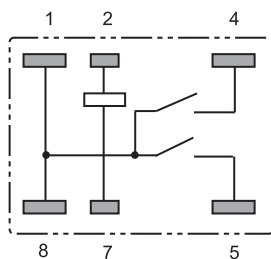
Note: Please use at rated coil voltage.

Dimensions

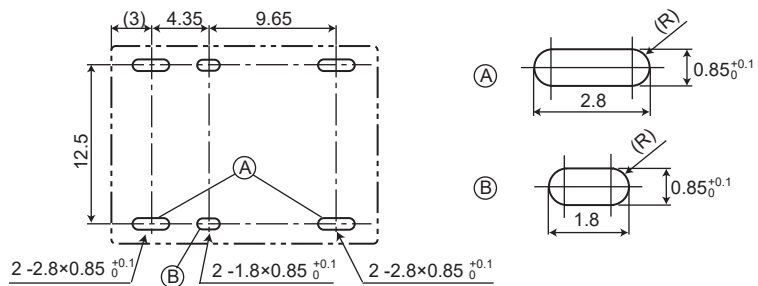
- Dimensions



- Schematics (BOTTOM VIEW)



- PC Board Mounting Hole Layout (BOTTOM VIEW)



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

* Tolerance of PC board mounting hole layout : ± 0.1 unless otherwise specified.

() : Reference value Unit: mm

FBR59-HW Series

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 FCL 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:

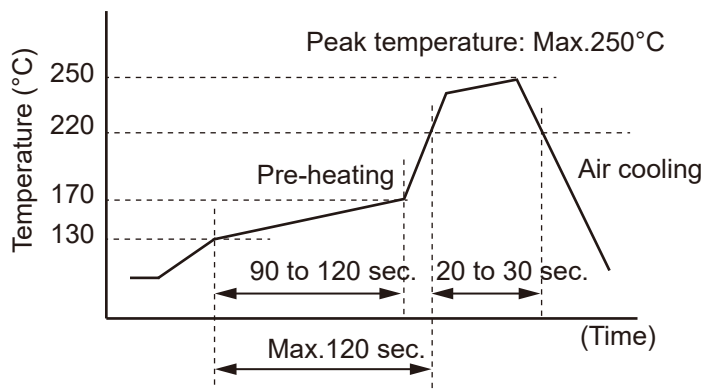
Pre-Heating: maximum 120°C
within 90 sec.
Soldering: dip within 5 sec. at 255°C±5°C
solder bath
Relay must be cooled by air immediately after
soldering

Solder by Soldering Iron:

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

Reflow Solder Condition:

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



Important notes for reflow soldering

- Temperature shall be measured at PC board upper surface
- Temperature at PC board upper surface may be change of PC board, components mounted on the PC board and/ or heating method. Please perform the confirmation test with your actual PC board.
- This reflow solder condition is applicable only for reflow-capable relays. Do not reflow reflow-incapable relays.

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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