Preliminary

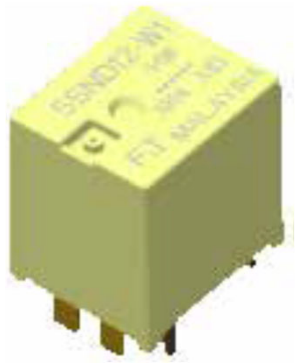
AUTOMOTIVE RELAY
1 POLE – 60A

FBR55-HW Series

RoHS Compliant

■ FEATURES

- Smallest high power 60A relay
- 60A (N.O. side), 1 form C
- High temperature grade (-40° C to +125° C)
- This relay is able to replace the Mini ISO relay
- Reflow capable (through hole reflow) type available
- Plastic sealed



■ APPLICATIONS

Radiator fan (double fan), fuel pump, EPS, head lamp, seat heater, DC-DC converter, motor braking circuit etc.

■ PART NUMBERS

[Example] FBR55 N D12 - W1 - HW - RW
(a) (b) (c) (d) (e) (f)

(a)	Relay type	FBR55	: FBR55 series
(b)	Enclosure	N	: Plastic sealed type
(c)	Coil rated voltage	D12	: 12VDC
(d)	Contact material	W1	: Silver tin oxide indium
(e)	Contact rating	HW	: 60A (N.O. side)
(f)	Soldering	Nil RW	: Standard (Flow soldering) : Reflow capable (THR)

Note: Actual marking does not carry the type name: “FBR”.
E.g.: Ordering code: FBR55ND12W1-HW, actual marking: 55ND12W1-HW

■ SPECIFICATIONS

Item			Specifications	Remarks / Conditions
Contact Data	Configuration		1c (1 form C)	
	Material		Silver tin oxide indium	
	Construction		Single	
	Voltage drop		Max. 100mV	At 1A 12VDC
	Contact rating		N.O.: 60A, 14VDC N.C.: 30A, 14VDC	Resistive load
	Max. carrying current		N.O.: 60A, 14VDC N.C.: 40A, 14VDC	At 20℃
	Max. inrush current		100A	Reference
	Min. switching load		1A 12VDC	Reference*1
Coil	Rated power consumption		480mW	At rated coil voltage, at 20℃
	Operate coil power		178mW	At operate voltage, at 20℃
	Operating temperature range		-40℃ to +125℃*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 60A
Insula-tion	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		13.6 x 16.5 x 16.2 mm	

*: 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.

FBR55-HW Series

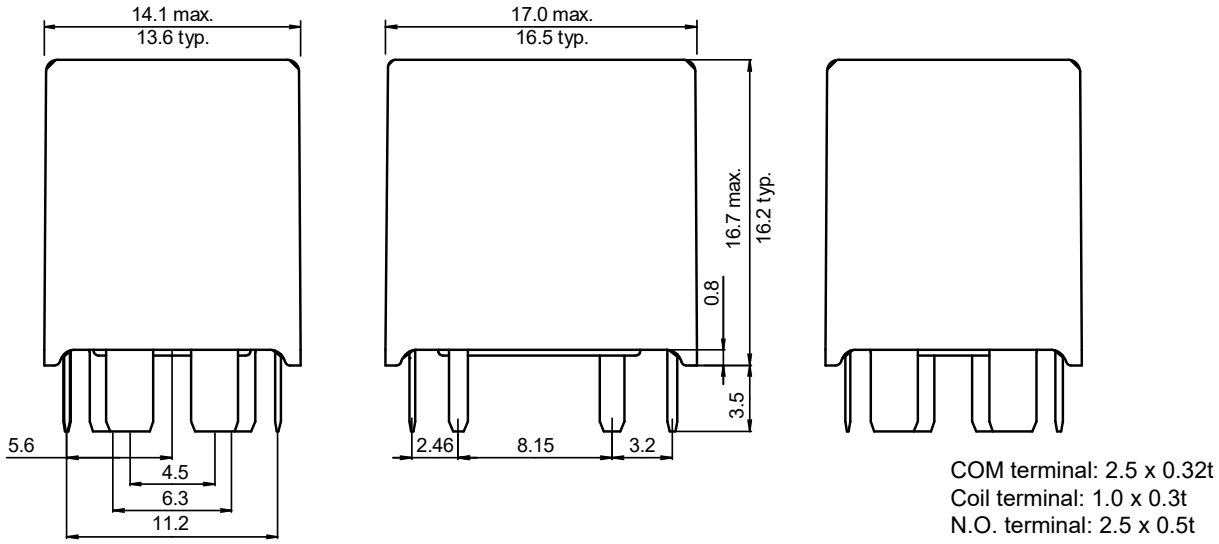
■ COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (VDC)	Nominal Power (mW)
D12	12	300	7.3 (at 20℃) 10.4 (at 125℃)	1.0 (at 20℃) 1.5 (at 125℃)	Approx. 480

Note: All values in the table are valid at 20℃ 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

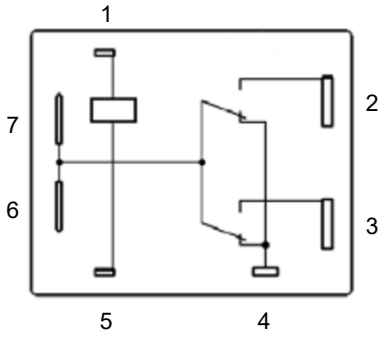


COM terminal: 2.5 x 0.32t
Coil terminal: 1.0 x 0.3t
N.O. terminal: 2.5 x 0.5t
N.C. terminal: 1.3 x 0.4t

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

Unit: mm

● Schematics(BOTTOM VIEW)



- Pattern shall be designed to short-circuit #2 and #3 on the PC board.

● PC Board Mounting Hole Layout

TBD

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:

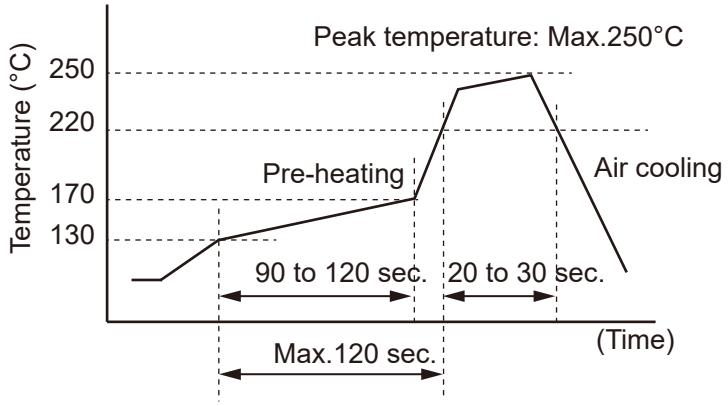
Soldering Iron:	30-60W
Temperature:	maximum 340-360˚C
Duration:	maximum 3 sec.

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.

Contact

Japan
FCL COMPONENTS LIMITED
Shinagawa Seaside Park Tower
12-4, Higashi-shinagawa 4-chome,
Tokyo 140 0002, Japan
Tel: +81-3-3450-1682
Email: fcl-contact@cs.fcl-components.com

North and South America
FCL COMPONENTS AMERICA, INC.
2055 Gateway Place Suite 480,
San Jose, CA 95110 USA
Tel: +1-408-745-4900
Email: fcai.components@fcl-components.com

Europe
FCL COMPONENTS EUROPE B.V.
Diamantlaan 25
2132 WV Hoofddorp, Netherlands
Tel: +31-23-556-0910
Email: info.fceu@cs.fcl-components.com

Asia Pacific
FCL COMPONENTS ASIA PTE LTD.
No. 20 Harbour Drive, #07-01B
Singapore 117612
Tel: +65-6375-8560
Email: fcal@fcl-components.com

China
FCL COMPONENTS (SHANGHAI) CO., LTD.
Unit 1105, Central Park - Jing An,
No.329 Heng Feng Road, Shanghai 200070,
China
Tel: +86-21-3253 0998
Email: fcsh@fcl-components.com

Web: www.fcl-components.com/en/

FCL Products are intended for general use, including without limitation, in personal, household and office environments, in buildings and for ordinary use in the industry. FCL Products are not intended to be used in applications where extremely high safety is required (”High Safety Required Applications”), such as, but not limited to, applications in nuclear facilities, in aircraft automatic flight control, in air traffic control, in mass transit system control, in missile launch system, in weapon systems, in medical equipment for life support or any application involving a direct serious risk of physical injury or death.
Please do not use FCL Products without securing the sufficient safety and reliability required for the High Safety Required Applications. In addition, FCL shall not be liable against the customer and/or any third party for any claims or damages arising in connection with the use of FCL Products in the High Safety Required Applications.
FCL warrants that its Products, if properly used and services, will conform to their specification and will be free from defects in material and workmanship for twelve months from delivery.
The implied warranties of merchantability and fitness for a particular purpose and all other warranties, representations and conditions, express or implied by statute, trade usage or otherwise, expect as set forth in this warranty, are excluded and shall not apply to the Products delivered.

The contents, data and information in this datasheet are provided by FCL Components Limited as a service only to its user and only for general information purposes. The use of the contents, data and information provided in this datasheet is at the users’ own risk.
FCL has assembled this datasheet with care and will endeavor to keep the contents, data and information correct, accurate, comprehensive, complete and up to date.
FCL Components Limited and affiliated companies do however not accept any responsibility or liability on their behalf, nor on behalf of its employees, for any loss or damage, direct, indirect or consequential, with respect to this datasheet, its contents, data, and information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof.
Nor do FCL Components Limited and affiliated companies accept on their behalf, nor on behalf of its employees, any responsibility or liability with respect to these datasheets, its contents, data, information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof. Rev. February 1, 2024.