

SILENT TWIN RELAY FOR AUTOMOTIVE APPLICATIONS

1 POLE x 2 – 25A (FOR 12V CAR BATTERY)

FTR-P2 Series

RoHS Compliant

■ FEATURES

- Low operating sound
An original silent mechanism decreases the propagation of operating sound when mounted on a PCB (Average sound pressure: 50dB at 5cm)
- Compact, high density package
350mm² mounting area
- High sensitivity, low power consumption
(nominal power consumption: 450mW)
- Simple PCB layout due to internal H-bridge connections typically used in motor applications
All terminals are on the perimeter
- High breaking capability.
- RoHS compliant



■ APPLICATIONS

- Power window, door lock, power seat, wiper (for H-bridge circuit) etc.

■ PART NUMBERS

[Example] FTR-P2 C N 012 W1
 (a) (b) (c) (d) (e)

| | | |
|-----|-----------------------|---|
| (a) | Relay type | FTR-P2 series |
| (b) | Contact configuration | C : 1c (1 Form C) x 2, H-bridge |
| (c) | Contact gap | N : 0.3mm gap |
| (d) | Coil rated voltage | 012 : 9....12VDC Please refer to coil rating table |
| (e) | Contact material | W1 : Silver tin oxide indium |

Actual marking does not carry the type name: "FTR"

E.g.: Ordering code: FTR-P2CN012W1 Actual marking: P2CN012W1

■ SPECIFICATIONS

| Item | | Specifications | Remarks/Conditions |
|---------|-----------------------------------|--|--|
| Contact | Configuration | 1c (1 Form C) x 2, H-bridge | |
| Data | Material | Silver tin oxide indium | |
| | Voltage drop | Max. 100mV | At 1A, 12VDC |
| | Contact rating | 14VDC, 25A | Motor locked load |
| | Max. carrying current | 25A/1 hour (25°C, nominal voltage applied to coil) | |
| | Max. switching voltage | 16VDC | Reference |
| | Max. switching current | 35A | Reference |
| | Min. switching load ^{*1} | 1A, 6VDC | Reference |
| Coil | Operating temperature range | -40°C to +85°C | No frost |
| | Storage temperature range | 40°C to +100°C | No frost |
| Time | Operate | Max. 10ms | At nominal voltage |
| | Release | Max. 5ms (without diode), Max. 15ms (with diode) | At nominal voltage |
| Life | Mechanical | Min. 10 x 10 ⁶ operations | |
| | Electrical | Min. 100 x 10 ³ operations | At contact rating |
| Others | Vibration resistance | Misoperation 10 to 200Hz, acceleration 44m/s ² (4.5G), constant acceleration | Coil ON/OFF, 3 axis, total 6 cycles |
| | | Endurance 10 to 200Hz, acceleration 44m/s ² (4.5G), constant acceleration | Coil OFF, 3 axis, total 6 hours |
| | Shock resistance | Misoperation 100 m/s ² (11±1ms) | Coil ON/OFF, 3 axis, total 36 operations |
| | | Endurance 1,000 m/s ² (6±1ms) | Coil OFF, 3 axis, total 18 operations |
| | Dimensions / Weight | | 16.5 x 21.0 x 18.0mm / Approximately 13g |
| | Average sound pressure | | Approximately 50dB at 5cm |

*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.

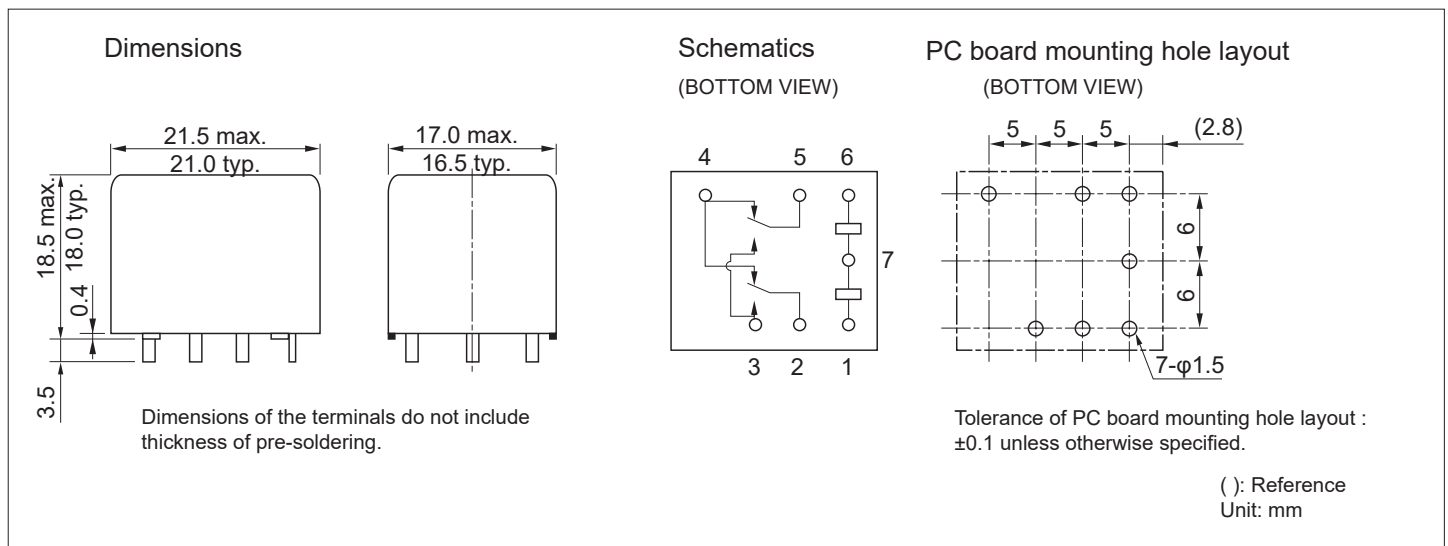
■ COIL DATA

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance ±10% (Ω) | Must Operate Voltage* ¹ (VDC) | Must Release Voltage* ¹ (VDC) |
|-----------|-----------------------------|-----------------------------|---|---|
| 009 | 9 | 180 | 5.5 (at 20°C) 6.9 (at 85°C) | 0.7 (at 20°C) 0.9 (at 85°C) |
| 010 | 10 | 220 | 6.3 (at 20°C) 7.9 (at 85°C) | 0.8 (at 20°C) 1.0 (at 85°C) |
| 012 | 12 | 320 | 7.3 (at 20°C) 9.2 (at 85°C) | 1.0 (at 20°C) 1.3 (at 85°C) |

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

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

■ DIMENSIONS



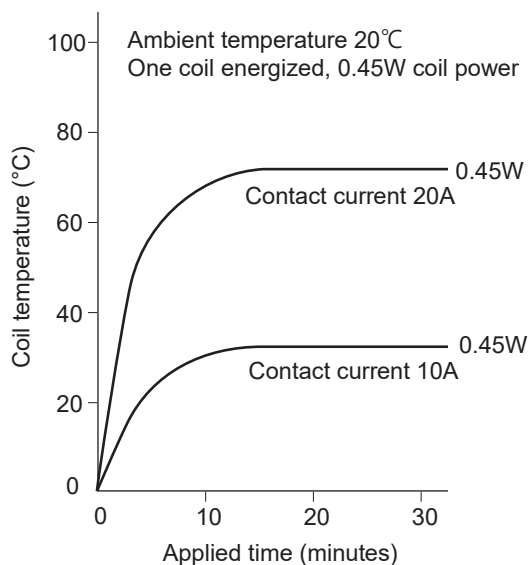
■ PART NUMBER LIST

| Part Number | Contact Configuration | Enclosure | Contact Material |
|---------------|-----------------------|----------------|-------------------------|
| FTR-P2CN()W1 | 1c (1 Form C) x 2 | Plastic sealed | Silver tin oxide indium |

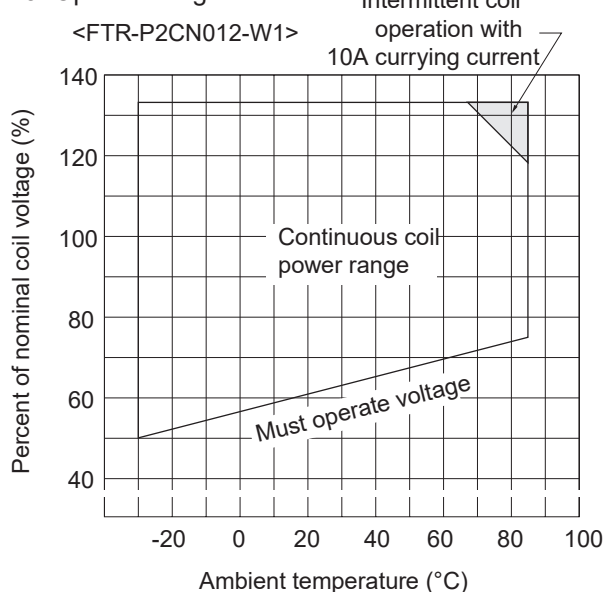
■ CHARACTERISTIC DATA

(Characteristic data is not guaranteed value but measured values of samples from production line.)

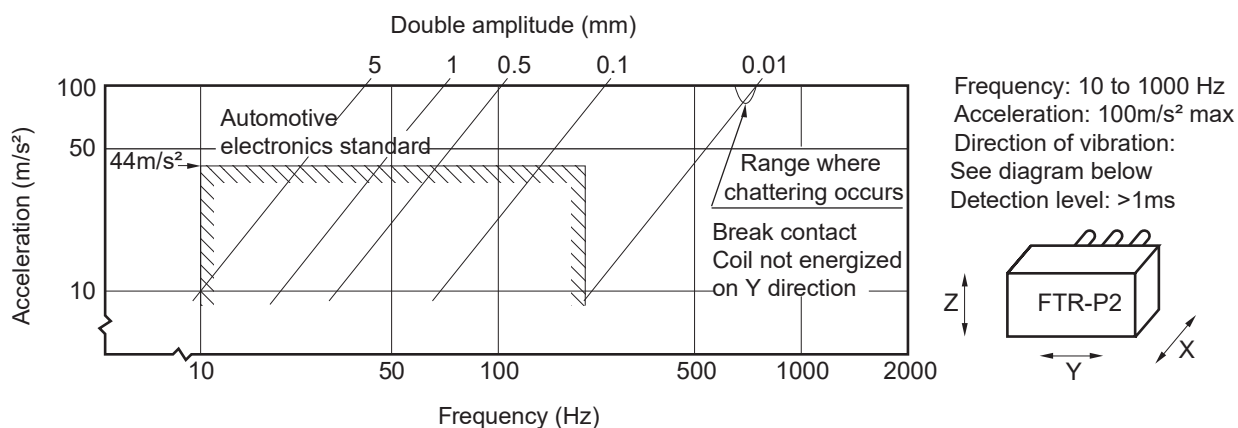
2. Coil temperature rise



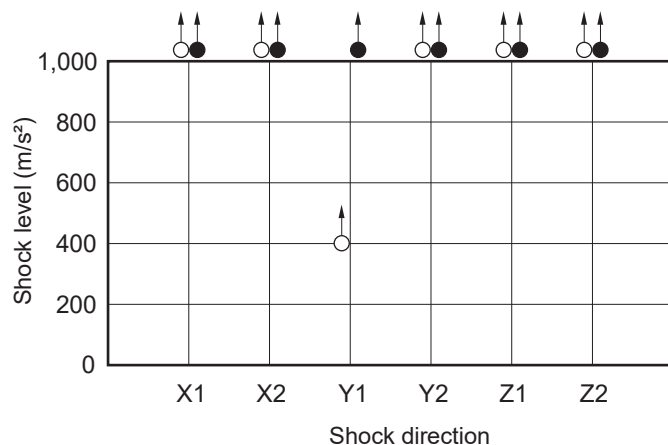
3. Operate range



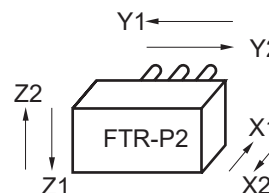
4. Vibration resistance characteristics



5. Shock resistance characteristics



Shock application time: 6±1ms, half-sine wave
Test conditions: Coil energized and de-energized
Shock direction: See diagram below
Detection level: >1ms



○ : Break contact (coil de-energized)
● : Make contact (coil energized)

CHARACTERISTIC DATA

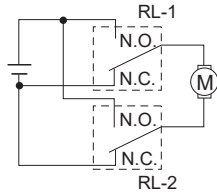
(Characteristic data is not guaranteed value but measured values of samples from production line.)

Life test (example)

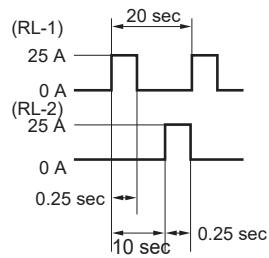
Test Conditions

25A 14VDC
Motor lock
100,000 operations min.
0.25 sec. ON, 9.75 sec. OFF

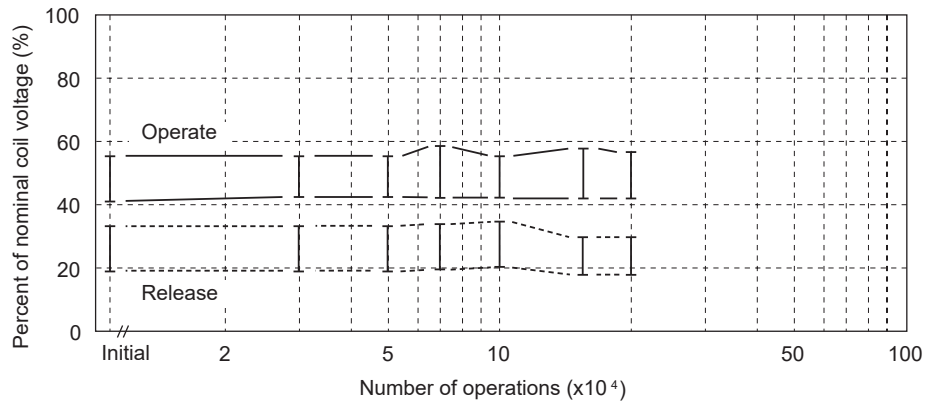
Test Circuit



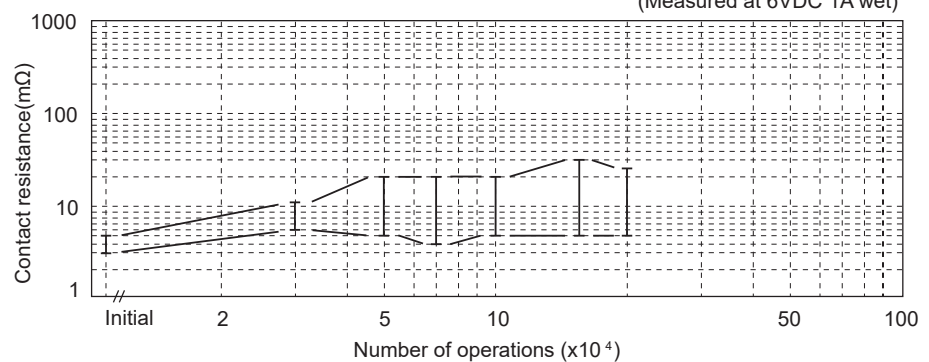
Current wave form



Operate/release voltage



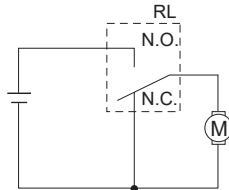
Contact resistance



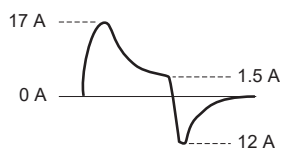
Test Conditions

17A 14VDC
Motor free
300,000 operations min.
0.25 sec. ON, 9.75 sec. OFF

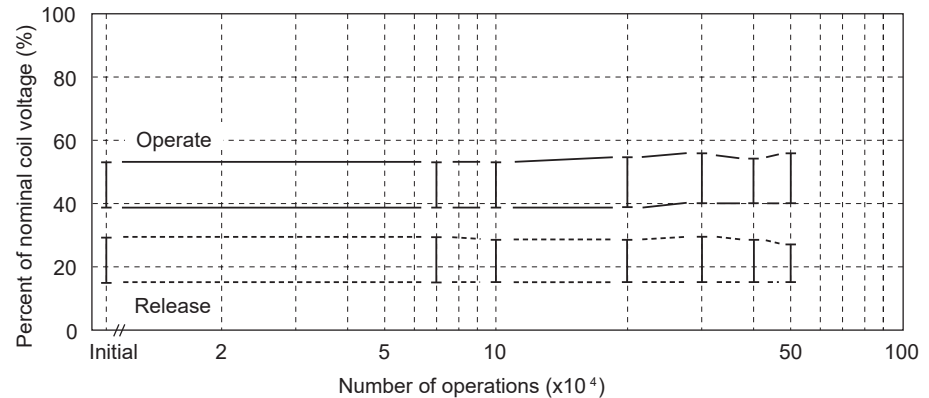
Test Circuit



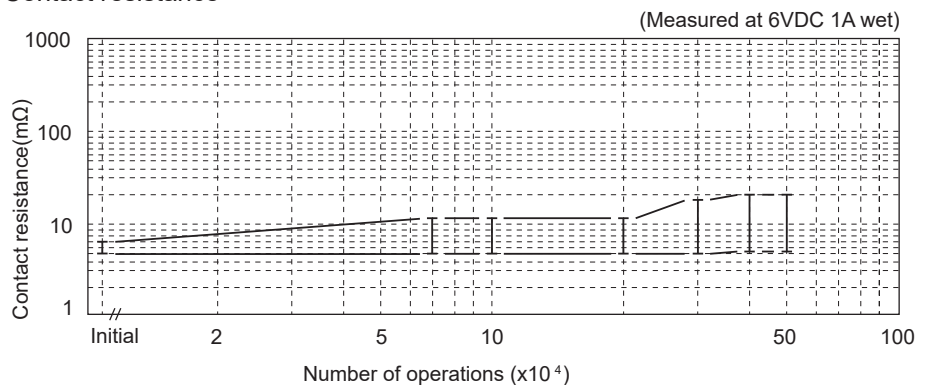
Current wave form



Operate/release voltage



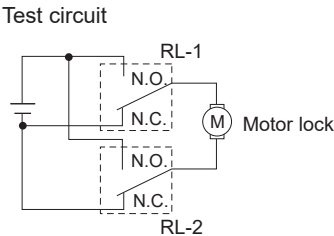
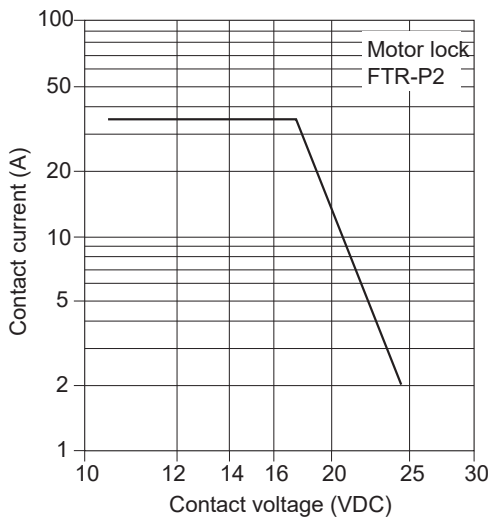
Contact resistance



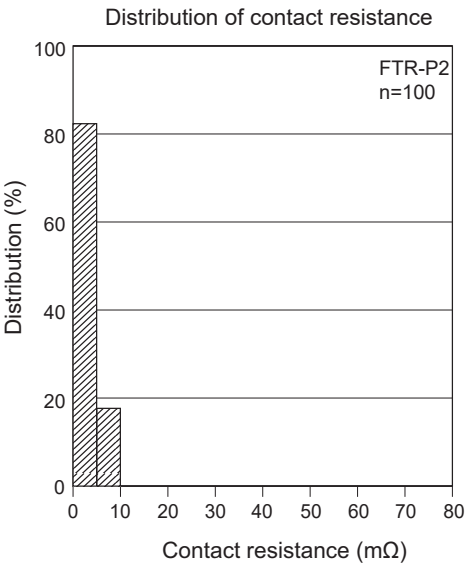
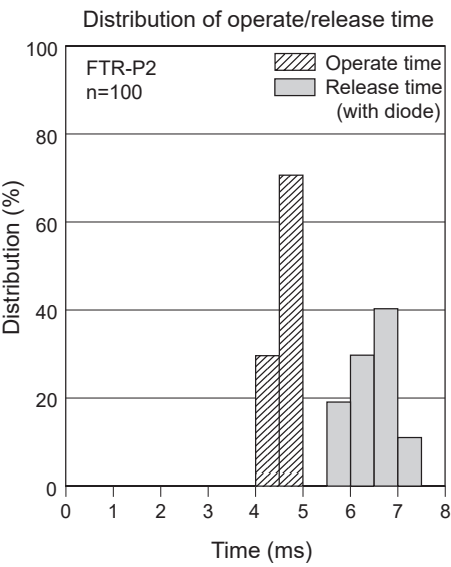
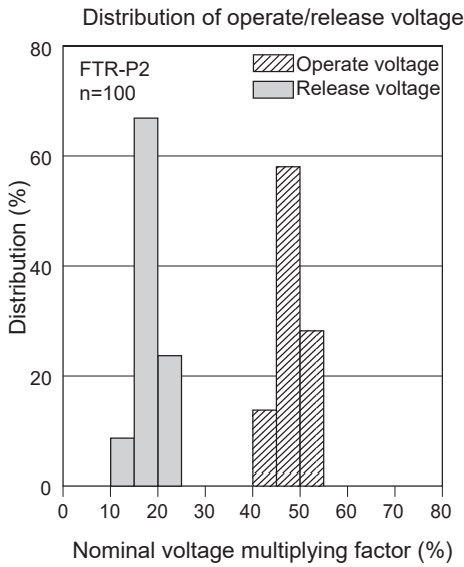
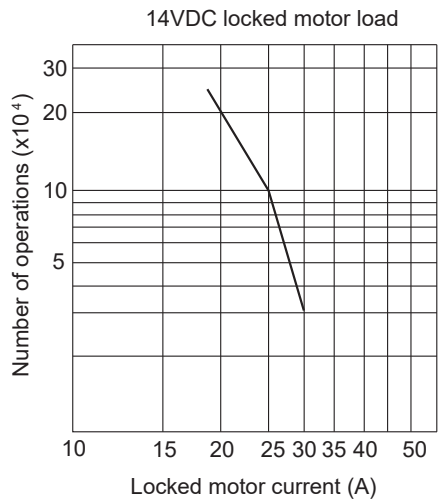
CHARACTERISTIC DATA

(Characteristic data is not guaranteed value but measured values of samples from production line.)

Maximum break capacity



Life curve



CAUTIONS

- All values mentioned in this datasheet are provided under ideal conditions. Please perform the confirmation test before actual use.
- Reflow soldering is prohibited.
- 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.

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: contact@fcl-components.us

Europe

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

Asia Pacific

FCL COMPONENTS ASIA PTE LTD.
51 Changi Business Park Central 2, #06-07
The Signature Singapore 486066
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

Hong Kong

FCL COMPONENTS HONG KONG CO.,
LIMITED
Unit 2313, Seapower Tower, Concordia
Plaza, No.1 Science Museum Road,
TST, Kowloon, Hong Kong
Tel: +852-2881-8495
Email: fcal@fcl-components.com

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

© 2025 FCL Components Limited. All rights reserved. All trademarks or registered trademarks are the property of their respective owners.

FCL Components 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 Components 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 Components Products without securing the sufficient safety and reliability required for the High Safety Required Applications.

In addition, FCL Components 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 Components Products in the High Safety Required Applications.

FCL Components 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, except 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 Components 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. December 24, 2025.