

# POWER RELAY

## 2 POLES-2A High Insulation/wide Gap FTR-C1 Series

### ■ FEATURES

- 2 Poles, 2 form C
- Contact gap: more than 0.6mm
- High surge voltage: 2500V between open contacts  
5000V between coil & contact
- Complies with Telcordia (former Bellcore) 2nd level surge
- Dielectric strength: 1500VAC between open contacts  
3000VAC between coil and contact
- Dimensions of large contact gap relay
  - Height: 9.3mm maximum (THT)  
9.65mm maximum (SMT)
  - Length: 15mm maximum
  - Width: 7.5mm maximum
- Conforms to IEC60950/ EN60950/UL1950/CSA C 22.2  
No. 950 working voltage 250V (supplementary)
- High insulation: Clearance: min 2.0mm (coil and contacts)  
Creepage: min 2.5mm (coil and contacts)
- High reliability-Bifurcated contacts
- Low power consumption 280mW (latching type 140mW)
- RoHS compliant



### ■ PARTNUMBER INFORMATION

[Example]     FTR-C1    C    A    012    G    -    B05  
                   (a)    (b)    (c)    (d)    (e)    (f)

|     |                       |                       |                                                    |
|-----|-----------------------|-----------------------|----------------------------------------------------|
| (a) | Relay type            | FTR-C1: FTR-C1 Series |                                                    |
| (b) | Contact Configuration | C                     | : Through hole type                                |
|     |                       | G                     | : Surface mount type                               |
|     |                       | S                     | : Surface mount type-reduced mounting area         |
| (c) | Coil Type / Enclosure | A                     | : Standard type                                    |
|     |                       | B                     | : Single coil latching type                        |
| (d) | Coil rated Voltage    | 012                   | : 3.....24 VDC<br>Coil table at page 3             |
| (e) | Contact Material      | G                     | : Gold plated silver palladium                     |
| (f) | Tape / reel ordering  | Nil                   | : standard packaging (tube)                        |
|     |                       | B05                   | : tape / reel package, only available for SMT type |

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

E.g.: Ordering code: FTR-C1CA012G

Actual marking: C1CA012G

# FTR-C1 SERIES

## ■ SPECIFICATION

| Item         |                          |                   | Non-latching<br>FTR-C1 ( ) A                        | Latching<br>FTR-C1 ( ) B |
|--------------|--------------------------|-------------------|-----------------------------------------------------|--------------------------|
| Contact Data | Configuration            |                   | 2C                                                  |                          |
|              | Construction             |                   | Bifurcated                                          |                          |
|              | Material                 |                   | Gold plated silver palladium                        |                          |
|              | Resistance (Initial)     |                   | ≤ 100mOhm @1A, 6VDC                                 |                          |
|              | Contact rating resistive |                   | 1A, 30VDC / 0.3A, 125VAC / 0.3A, 110VDC             |                          |
|              | Max. Switching Voltage   |                   | 250VAC / 220VDC                                     |                          |
|              | Max. Switching Power     |                   | 62.5VA / 30W                                        |                          |
|              | Max. Carry Current       |                   | 2A                                                  |                          |
|              | Min. Switching Load *    |                   | 10mA, 10mVDC                                        |                          |
| Life         | Mechanical               |                   | 2x 10 <sup>6</sup>                                  |                          |
|              | Electrical               |                   | 100x 10 <sup>3</sup> at 0.3A, 125VAC / 1A, 30VDC    |                          |
| Coil Data    | Rated Power              |                   | 280 to 300mW                                        | 140 to 180mW             |
|              | Operate Power            |                   | 158 to 162mW                                        | 158 to 162mW             |
|              | Operating temp range     |                   | -40 to +85C (no frost)                              |                          |
| Timing Data  | Operate                  |                   | ≤ 6ms (at nominal voltage, no bounce)               |                          |
|              | Release                  |                   | ≤ 6ms (at nominal voltage, no bounce)               |                          |
| Insulation   | Resistance (Initial)     |                   | ≥ 1000MOhm @500VDC                                  |                          |
|              | Dielectric strength      | Open contacts     | 1500VAC (50/60Hz) 1min                              |                          |
|              | Strength                 | Contacts to coil  | 3000VAC (50/60Hz) 1min                              |                          |
|              | Surge strength           | Coil to contacts  | 5000V, 1.2 x 10μs standard wave / 6000V, 1.2 x 50μs |                          |
|              | Clearance                | open contacts     | 0.6mm                                               |                          |
|              | Clearance                | adjecent contacts | 1.54mm                                              |                          |
|              | Clearance                | coil and contacts | 2.0mm                                               |                          |
|              | Creepage                 | open contacts     | 1.54mm                                              |                          |
|              | Creepage                 | coil and contacts | 2.0mm                                               |                          |
| Other        | Vibration Resistance     | Misoperation>1us  | 10 to 55Hz double amplitude 3.3mm                   |                          |
|              |                          | Endurance         | 10 to 55Hz double amplitude 5mm                     |                          |
|              | Shock                    | Misoperation>1us  | Min. 500m/s <sup>2</sup>                            |                          |
|              |                          | Endurance         | Min. 1000m/s <sup>2</sup>                           |                          |
|              | Weight                   |                   | Approx. 2 g                                         |                          |

\* 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.

# FTR-C1 SERIES

## ■ COIL RATING

Standard type

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) | Must Operate Voltage (V) *1 | Must Release-Voltage (V) *1 | Max. Coil Voltage (V) | Nominal Coil Power (mW) |
|-----------|--------------------------|-------------------------------|-----------------------------|-----------------------------|-----------------------|-------------------------|
| 003       | 3                        | 32.1                          | 2.25                        | 0.3                         | 4.5                   | 230                     |
| 4.5       | 6                        | 72.3                          | 3.38                        | 0.45                        | 6.75                  |                         |
| 005       | 9                        | 89.3                          | 3.75                        | 0.5                         | 7.5                   |                         |
| 012       | 12                       | 514                           | 9                           | 1.2                         | 18                    |                         |
| 024       | 18                       | 1920                          | 18                          | 2.4                         | 36                    | 300                     |

Latching type

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) | Must Operate Voltage (V) *1 | Must Release-Voltage (V) *1 | Max. Coil Voltage (V) | Nominal Coil Power (mW) |
|-----------|--------------------------|-------------------------------|-----------------------------|-----------------------------|-----------------------|-------------------------|
| 003       | 3                        | 64.0                          | +2.25                       | 2.25                        | 4.5                   | 140                     |
| 4.5       | 4.5                      | 145                           | +3.38                       | 3.38                        | 6.75                  |                         |
| 005       | 5                        | 179                           | +3.75                       | 3.75                        | 7.5                   |                         |
| 012       | 12                       | 1029                          | +9                          | 9                           | 18                    |                         |
| 024       | 24                       | 3200                          | +18                         | 18                          | 36                    | 180                     |

Note: All values in the table are measured at 20°C.

No contact current at 20°C

\*1: Specified values are subject to pulse wave voltage

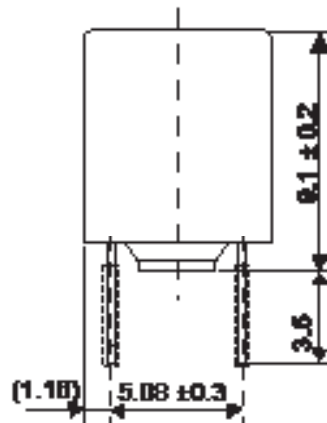
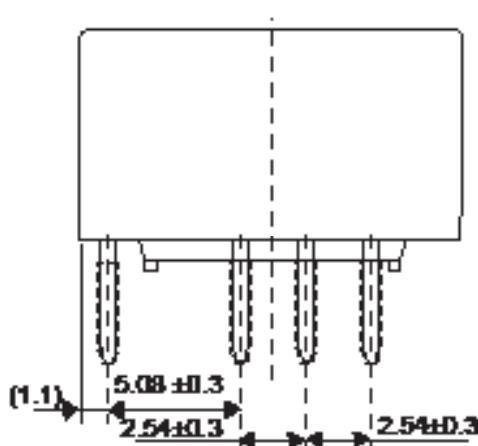
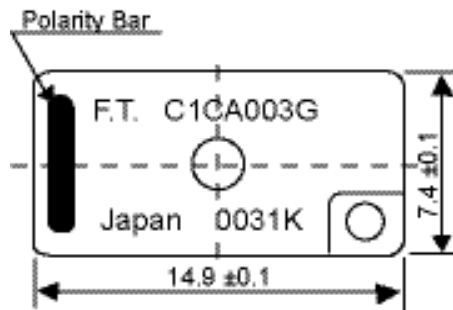
## ■ SAFETY STANDARDS

| Type | Compliance               | Contact rating                          |
|------|--------------------------|-----------------------------------------|
| UL   | UL 508                   | Flammability: UL 94-V0 (plastics)       |
|      | E63615                   | 0.3A, 125 VAC (resistive)<br>1 A, 30VDC |
| CSA  | C22.2 No. 14<br>LR 40304 | 0.3A, 110VDC                            |
| BSI  | IEC 60950-1              |                                         |

# FTR-C1 SERIES

## ■ DIMENSIONS AND SCHEMATICS

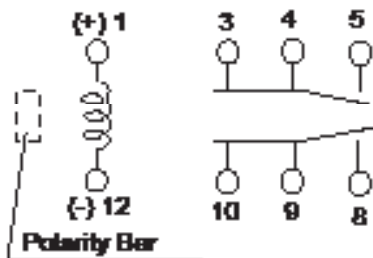
Through hole type



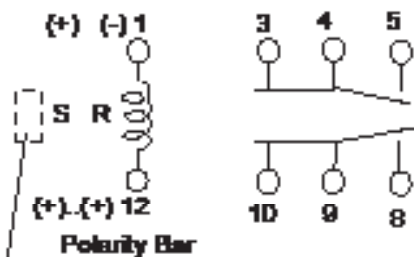
Unit: mm

## ■ TERMINAL DESIGNATIONS

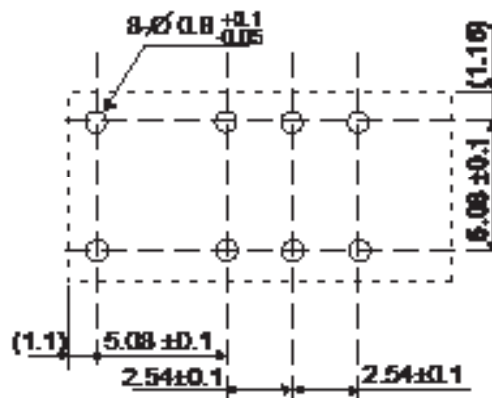
Standard type  
(Bottom view de-energized position)



Single Coil Latching type  
(Bottom view reset position)



## ■ RECOMMENDED MOUNTING PAD



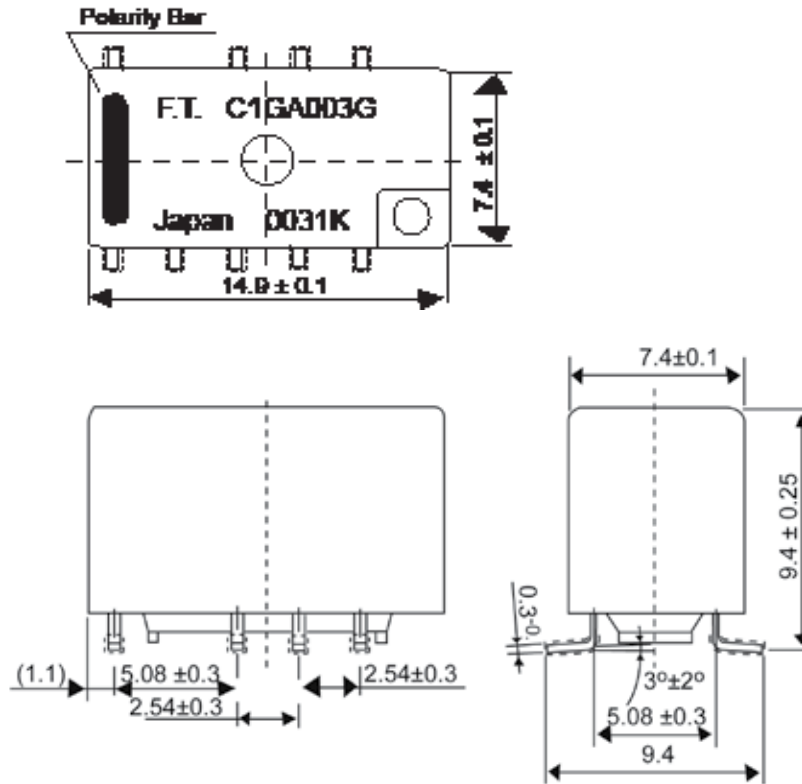
S shows the polarity of set position  
R shows the polarity of reset position

Unit: mm

# FTR-C1 SERIES

## ■ DIMENSIONS AND SCHEMATICS

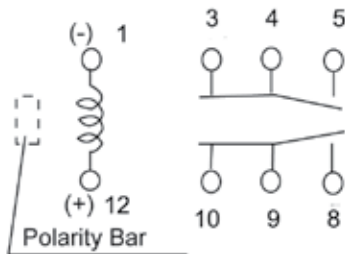
Surface mount type



## ■ TERMINAL DESIGNATIONS

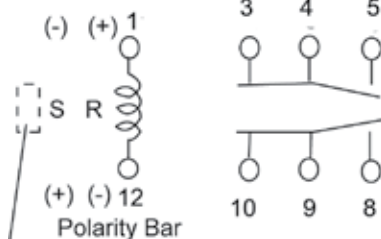
Standard type

(Bottom view reset position)

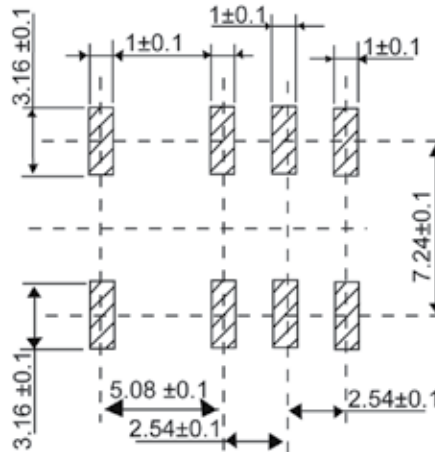


Single Coil Latching type

(Bottom view reset position)



## ■ RECOMMENDED MOUNTING PAD



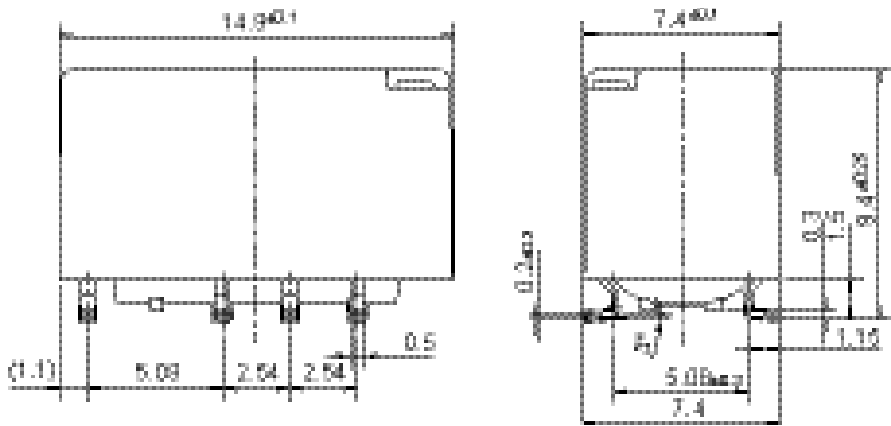
S shows the polarity of set position  
R shows the polarity of reset position

Unit: mm

# FTR-C1 SERIES

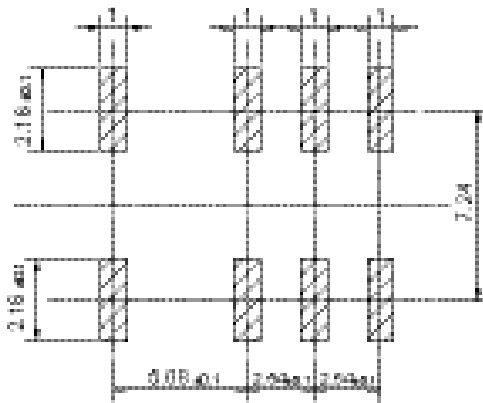
## ■ DIMENSIONS AND SCHEMATICS

Space saving type



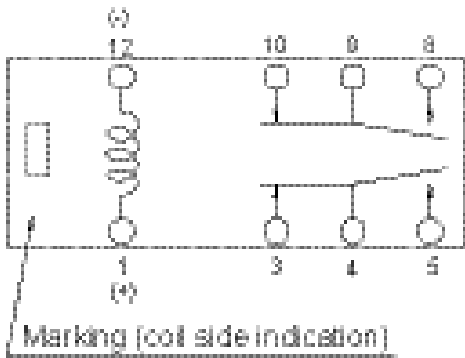
### PC board mounting pad layout

Top view



### Schematics

Top view



Unit: mm

# FTR-C1 SERIES

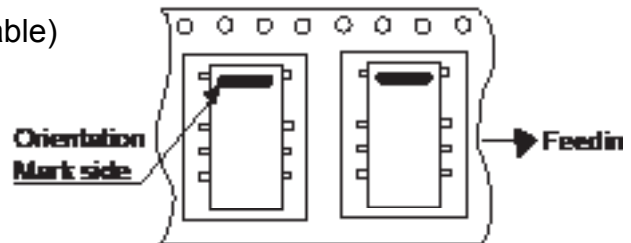
## ■ RECOMMENDED SOLDERING CONDITIONS SMT (TEMPERATURE PROFILE, please see page 9)

Note: 1. Temperature profiles show the temperature of PC board surface.  
2. Please perform soldering test with your actual PC board before mass production, since the temperatures of PC board surfaces vary according to the size of PC board, status of parts mounting and heating method.

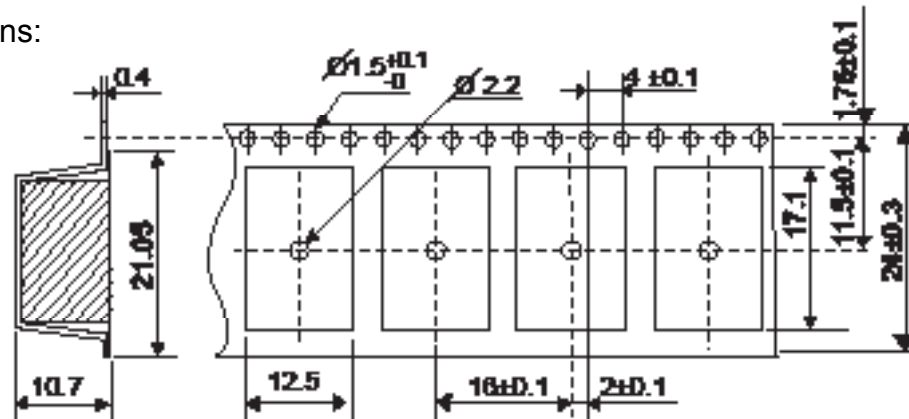
## ■ PACKAGING

Packaging method (only tape packaging is available)

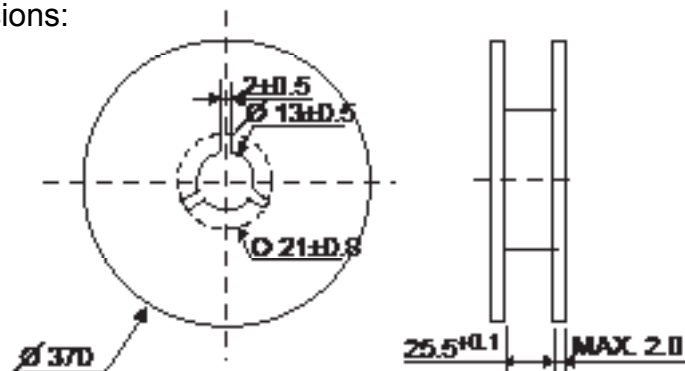
1. Taping standards: JIS C 0806 and RC-10092B (EIAJ)
2. Reel type: TB2416 or TB2416
3. Reel type: RD24D
4. Quantity of 1 reel: 500 pieces



Tape Dimensions:



Reel Dimensions:



Unit: mm

## RoHS Compliance and Lead Free Information

### 1. General Information

- All signal and power relays produced by Fujitsu Components are compliant with RoHS directive 2002/95/EC 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 of our signal and power relays are lead-free. Please refer to Lead-Free Status Info for older date codes at: <http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>
- 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.
- "LF" is marked on each outer and inner carton. (No marking on individual relays).

### 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 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.

# FTR-C1 SERIES

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