

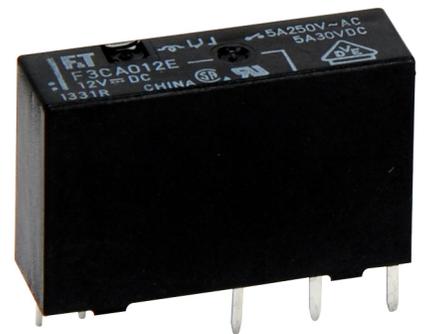
# POWER RELAY

## 1 POLE - 5A Change Over Relay

### FTR-F3 Series

#### ■ FEATURES

- High density mounting  
Height: 15mm  
Mounting space: 164mm<sup>2</sup>
- High insulation  
Insulation distance: 7mm between coil and contacts  
(conforms to IEC 60065)  
Dielectric strength: 4KV  
Surge strength: 10KV
- Cadmium free contact for eco-program
- Safety standards  
UL, CSA, VDE
- Plastic sealed relay, RTIII
- RoHS compliant  
Please see page 6 for more information



#### ■ Part Numbers

[Example]    FTR-F3    C    A    012    E  
                   (a)    (b)    (c)    (d)    (e)

|     |                       |   |
|-----|-----------------------|---|
| (a) | Relay type            | FTR-F3 : FTR-F3 series                            |
| (b) | Contact configuration | C : 1 form C                                      |
| (c) | Coil type (power)     | A : 360mW   |
| (d) | Coil rated voltage    | 012 : 5..... 24VDC<br>Coil rating table at page 3 |
| (e) | Contact material      | E : AgNi  |

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

E.g.: Ordering code: FTR-F3CA012E Actual marking: F3CA012E

# FTR-F3 Series

## ■ Specifications

| Item           |                             |                   | FTR-F3  | Remarks / conditions |  |
|----------------|-----------------------------|-------------------|---|----------------------|--|
| Contact data   | Configuration               |                   | 1 form C  |                      |  |
|                | Construction                |                   | Single  |                      |  |
|                | Material                    |                   | AgNi  |                      |  |
|                | Resistance                  |                   | Max. 100mOhm  | Initial at 1A, 6VDC  |  |
|                | Contact rating              |                   | 5A, 250VAC, 30VDC   | Resistive            |  |
|                | Max. carrying current       |                   | 5A  |                      |  |
|                | Max. switching voltage      |                   | 277VAC, 30VDC   |                      |  |
|                | Max. switching power        |                   | 1,250VA, 150W   |                      |  |
|                | Min. switching load *1      |                   | 10 mA, 5VDC   |                      |  |
| Coil           | Rated power (20°C)          |                   | 360mW   |                      |  |
|                | Operating temperature range |                   | -40°C ~ +70°C (at rated voltage)  | No frost             |  |
| Timing data    | Operate                     |                   | Max. 10ms   | without bounce       |  |
|                | Release                     |                   | Max. 10ms   | without bounce       |  |
| Life           | Mechanical                  |                   | Min. 2 x 10 <sup>6</sup> operations   |                      |  |
|                | Electrical (resistive)      |                   | Min. 100 x 10 <sup>3</sup> operations (3A, 250VAC/30VDC)<br>Min. 50 x 10 <sup>3</sup> operations (5A, 250VAC/30VDC) | At rated load        |  |
| Insulation     | Insulation resistance       |                   | Min. 1000MΩ at 500VDC   |                      |  |
|                | Dielectric strength         | Open contacts     | 750VAC (50/60Hz), 1 minute  |                      |  |
|                |                             | Coil contact      | 4000VAC (50/60Hz), 1 minute   |                      |  |
|                | Surge strength              | Coil to contacts  | 10,000V / 1.2 x 50μs standard wave  |                      |  |
|                | Clearance                   |                   | 7mm   |                      |  |
|                | Creepage                    |                   | 7mm   |                      |  |
|                | EN61810-1, VDE0435          | Voltage           |   | 250V                 |  |
|                |                             | Pollution         |   | 2                    |  |
| Material group |                             | III               |   |                      |  |
| Other          | Vibration resistance        | Misoperation      | 10Hz ~ 55Hz ~ 10Hz single amplitude<br>0.75mm   |                      |  |
|                |                             | Endurance         | 10Hz ~ 55Hz ~ 10Hz single amplitude<br>0.75mm   |                      |  |
|                | Shock resistance            | Misoperation ≥1us | Min. 100m/s <sup>2</sup> (11 ± 1ms)   |                      |  |
|                |                             | Endurance         | Min. 1,000m/s <sup>2</sup> (6 ± 1ms)  |                      |  |
|                | Dimensions / weight         |                   | 7.0 x 23.4 x 15.0 mm / approx. 6g   |                      |  |
|                | Sealing                     |                   | Plastic sealed RTIII  |                      |  |

\*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

# FTR-F3 Series

## ■ Coil Data

| Coil code | Rated Coil Voltage (VDC) | Coil Resistance +/-10% ( $\Omega$ ) | Must Operate Voltage* (VDC) | Must Release Voltage* (VDC) | Rated Power (mW) |
|-----------|--------------------------|-------------------------------------|-----------------------------|-----------------------------|------------------|
| 005       | 5                        | 69                                  | 3.75                        | 0.5                         | 360              |
| 006       | 6                        | 100                                 | 4.5                         | 0.6                         |                  |
| 009       | 9                        | 225                                 | 6.75                        | 0.9                         |                  |
| 012       | 12                       | 400                                 | 9                           | 1.2                         |                  |
| 018       | 18                       | 900                                 | 13.5                        | 1.8                         |                  |
| 024       | 24                       | 1,600                               | 18                          | 2.4                         |                  |

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. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

## ■ Safety Standards

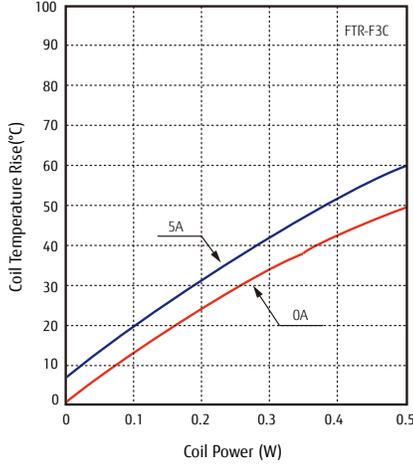
| Type | Compliance  | Contact rating   |
|------|---|--|
| UL   | UL 508<br>File No. E63614                           | Flammability: UL 94-V-0 (plastics)   |
|      |   | 5A, 30 VDC / 250VAC (resistive)<br>3A, 30 VDC / 250 VAC (resistive)                                |
| CSA  | C22.2 No. 14<br>File No. LR 40304                   |  |
| VDE  | IEC/EN61810-1<br>EN60065 clause 14.6.1              | 5A, 250 VAC, $\cos\phi=1$<br>5A, 30 VDC L/R=0ms<br>3A, 250 VAC, $\cos\phi=1$<br>3A, 30 VDC L/R=0ms |
| CQC  | GB15092.1 / GB/T21811.1<br>17002164382, 04001010925 | 5A 250VAC / 30VDC  |

# FTR-F3 Series

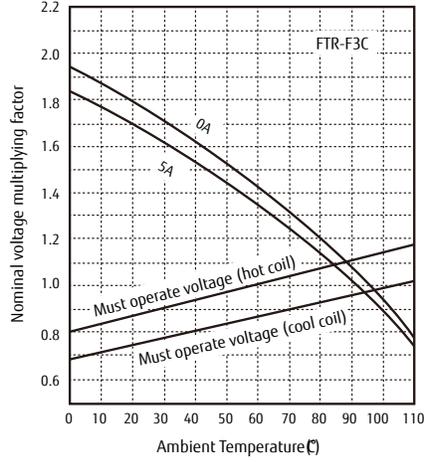
## ■ Characteristic Data (Reference)

\* Characteristic data is not guaranteed value but measured values of samples from production line.

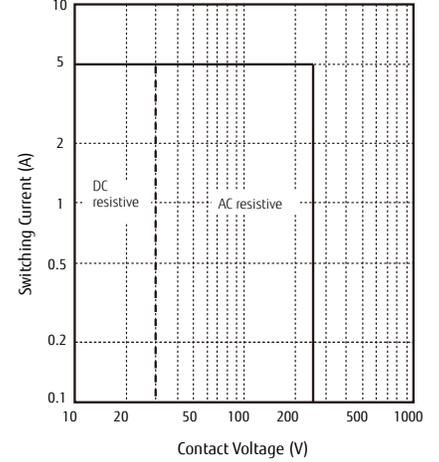
Coil Temperature Rise



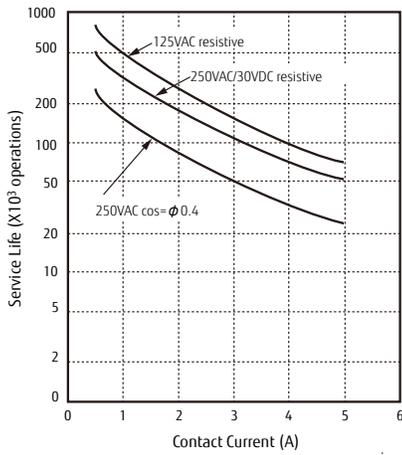
Operating Range



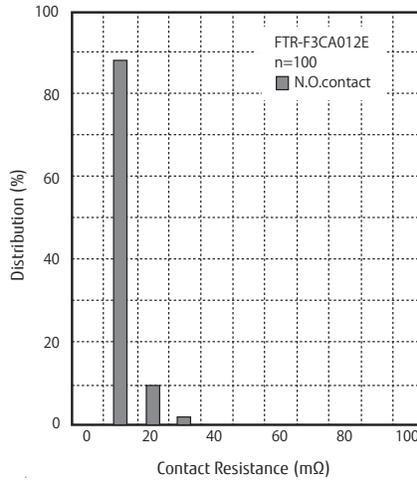
Maximum Switching Power



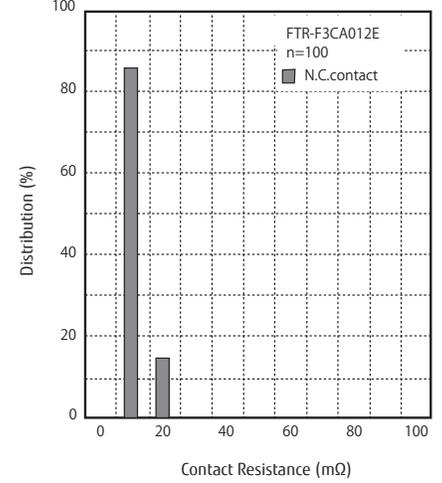
Life Curve



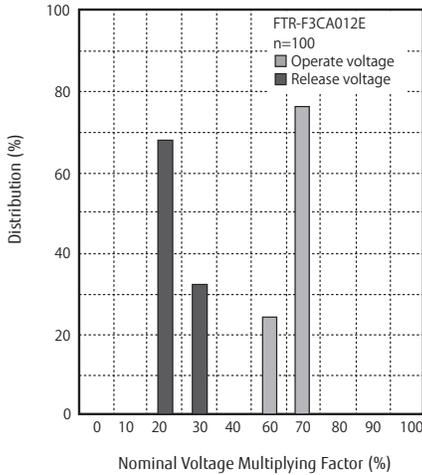
Distribution of Contact Resistance (N.O.)



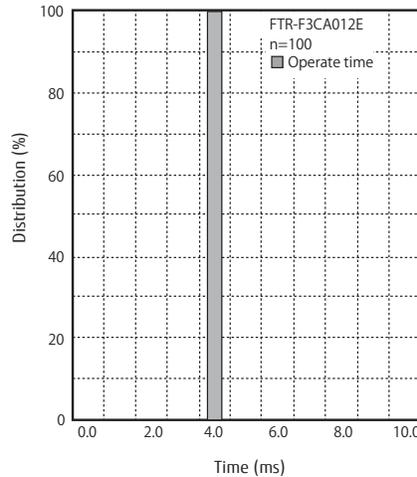
Distribution of Contact Resistance (N.C.)



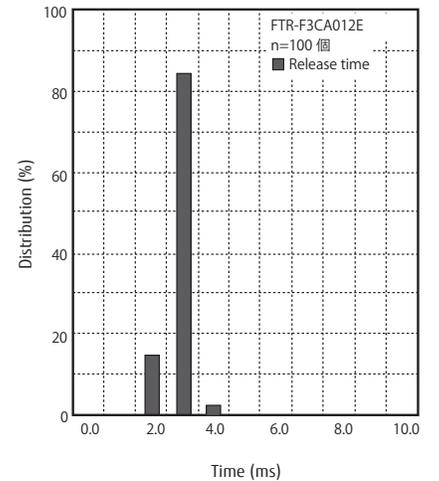
Distribution of Operation & Release Voltage



Distribution of Operation Time



Distribution of Release Time

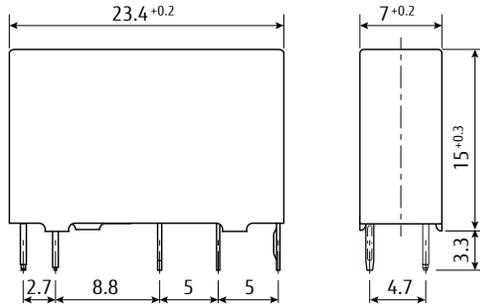


# FTR-F3 Series

## ■ Dimensions

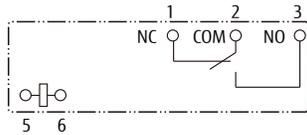
- Dimensions

Changeover contact type

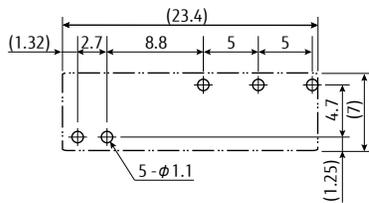


\* Dimensions of the terminals do not include thickness of pre-solder.

- Schematics  
(BOTTOM VIEW)



- PC Board Mounting Hole Layout  
(BOTTOM VIEW)



( ): Reference value  
Unit: mm

\* Tolerance of PC board mounting hole layout :  $\pm 0.1$  unless otherwise specified.

# FTR-F3 Series

## GENERAL INFORMATION

### 1. ROHS Compliance

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU including amendments.
- Use of Cadmium in electrical contacts is exempted as per Annex III of the RoHS directive 2011/65/EU. Please consider expiry date of exemption. Relays with Cadmium containing contacts are not to be used for new designs.
- All relays are lead-free. Please refer to Lead-Free Status Info for older date codes at: <http://www.fujitsu.com/downloads/MICRO/fcai/relays/lead-free-letter.pdf>
- Characteristic data is not guaranteed values, but measured values of samples from production line.

### 2. Recommended lead free solder condition

- 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 350-360°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-F3 Series

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