

# POWER RELAY

## 1 POLE - 5A Change Over Relay

### FTR-F3 Series

RoHS Compliant



#### ■ FEATURES

- High density mounting  
Height: 15mm  
Mounting space: 164mm<sup>2</sup>
- High insulation:  
Insulation distance: 7mm between coil and contacts  
Dielectric strength: 4,000V  
Surge strength: 10,000V
- Cadmium free contact for eco-program
- Safety standards: UL, CSA, VDE, CQC
- Plastic sealed relay, RTIII
- RoHS compliant



#### ■ APPLICATIONS

Control of industrial equipment, equipment for home appliances

#### ■ PART NUMBERS

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

|     |                       |                                                      |
|-----|-----------------------|------------------------------------------------------|
| (a) | Relay type            | FTR-F3 series                                        |
| (b) | Contact configuration | C : 1c (1 Form C)                                    |
| (c) | Coil type (power)     | A : 360mW                                            |
| (d) | Coil rated voltage    | 12 : 5....24VDC<br>Please refer to coil rating table |
| (e) | Contact material      | E : AgNi                                             |

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

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

## ■ SPECIFICATIONS

| Item       |                                   |                  | Specifications                                                                                                      | Remarks/Conditions                       |
|------------|-----------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Contact    | Configuration                     |                  | 1c (1 Form C)                                                                                                       |                                          |
| Data       | Construction                      |                  | Single                                                                                                              |                                          |
|            | Material                          |                  | AgNi                                                                                                                |                                          |
|            | Resistance                        |                  | Max. 100mΩ                                                                                                          | 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 <sup>*1</sup> |                  | 10mA, 5VDC                                                                                                          |                                          |
| Coil       | Rated power (20°C)                |                  | 360mW                                                                                                               |                                          |
|            | Operating temperature range       |                  | -40°C to +70°C (at rated voltage)                                                                                   | No frost                                 |
| Time       | 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) |                                          |
| Insulation | Insulation resistance             |                  | Min. 1,000MΩ                                                                                                        | At 500VDC                                |
|            | Dielectric strength               | Open contacts    | 750VAC (50/60Hz), 1 minute                                                                                          |                                          |
|            |                                   | Coil to contacts | 4,000VAC (50/60Hz), 1 minute                                                                                        |                                          |
|            | Surge strength                    | Coil to contacts | 10,000V / 1.2 x 50μs standard wave                                                                                  |                                          |
|            | Clearance                         |                  | 7mm                                                                                                                 |                                          |
|            | Creepage                          |                  | 7mm                                                                                                                 |                                          |
|            | EN61810-1                         | Voltage          | 250V                                                                                                                |                                          |
|            |                                   | Pollution        | 2                                                                                                                   |                                          |
|            |                                   | Material group   | III                                                                                                                 |                                          |
| Others     | Vibration resistance              | Misoperation     | 10Hz to 55Hz to 10Hz single amplitude 0.75mm                                                                        | Coil ON/OFF, 3 axis, total 6 cycles      |
|            |                                   | Endurance        | 10Hz to 55Hz to 10Hz single amplitude 0.75mm                                                                        | Coil OFF, 3 axis, total 6 hours          |
|            | Shock resistance                  | Misoperation     | Min. 100m/s <sup>2</sup> (11±1ms)                                                                                   | Coil ON/OFF, 3 axis, total 36 operations |
|            |                                   | Endurance        | Min. 1,000m/s <sup>2</sup> (6±1ms)                                                                                  | Coil OFF, 3 axis, total 18 operations    |
|            | Dimensions / Weight               |                  | 7.0 x 23.4 x 15.0 mm / approx. 6g                                                                                   |                                          |
|            | Sealing                           |                  | Plastic sealed RTIII                                                                                                |                                          |

\*: 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.

## ■ COIL DATA

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance $\pm 10\%$ ( $\Omega$ ) | Must Operate Voltage** (VDC) | Must Release Voltage** (VDC) | Nominal 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                                     | 13.6                         | 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

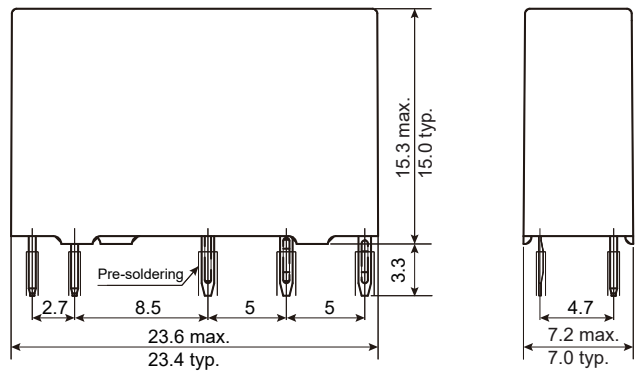
| Type | Compliance                                   | Contact Rating                                                                                  |
|------|----------------------------------------------|-------------------------------------------------------------------------------------------------|
| UL   | Flammability: UL 94-V-0 (plastics)           | 5A, 250VAC / 30VDC (resistive)<br>3A, 250VAC / 30VDC (resistive)                                |
|      | UL 60947-1 / UL 60947-4-1<br>File No. E63614 |                                                                                                 |
| CSA  | C22.2 No. 14<br>File No. LR 40304            |                                                                                                 |
| VDE  | IEC/EN61810-1<br>File No. 40015024           | 5A, 250VAC, $\cos\phi=1$<br>5A, 30VDC, L/R=0ms<br>3A, 250VAC, $\cos\phi=1$<br>3A, 30VDC L/R=0ms |
| CQC  | GB/T21711.1<br>File No. 04001010925          | 5A, 250VAC / 30VDC                                                                              |

## ■ PART NUMBER LIST

| Part Number  | Contact Configuration | Contact Rating    | Rated Coil Power | Contact Material |
|--------------|-----------------------|-------------------|------------------|------------------|
| FTR-F3CA( )E | 1c (1 Form C)         | 5A 250VAC / 30VDC | Approx. 360mW    | AgNi             |

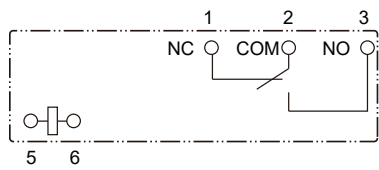
DIMENSIONS

Dimensions

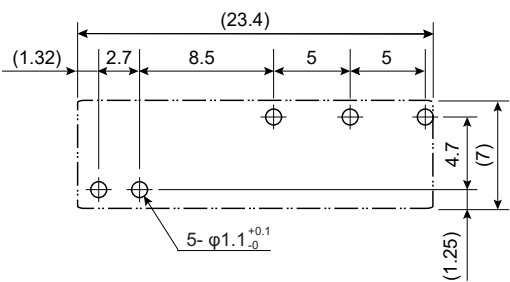


\* Dimensions of the terminals do not include thickness of pre-soldering.

Schematics  
(BOTTOM VIEW)



PC Board Mounting Hole Layout  
(BOTTOM VIEW)



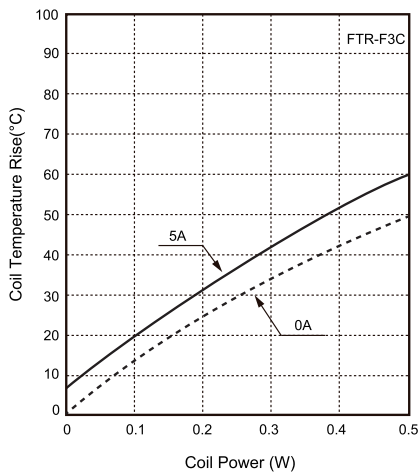
\* Tolerance of PC board mounting hole layout :  $\pm 0.1$  unless otherwise specified.

( ): Reference value  
Unit: mm

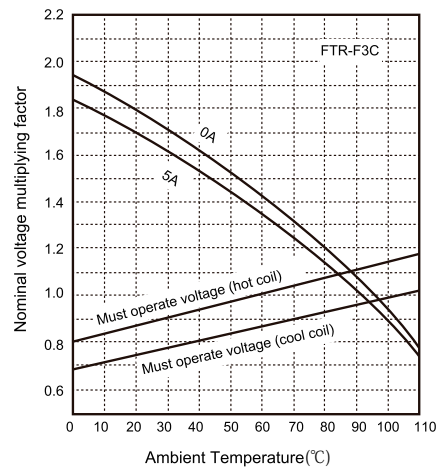
## ■ CHARACTERISTIC DATA

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

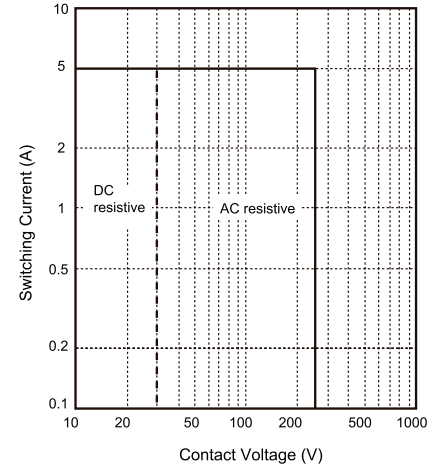
Coil Temperature Rise



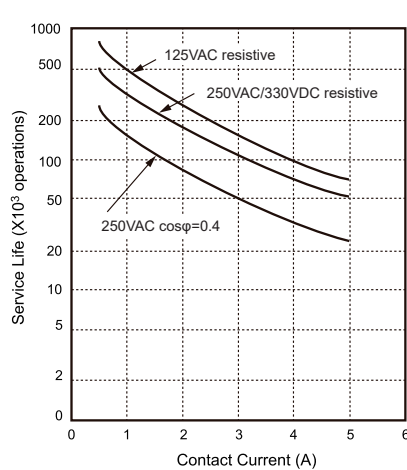
Operating Range



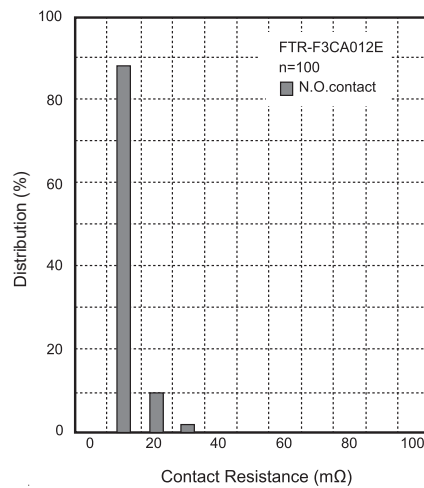
Maximum Switching Power



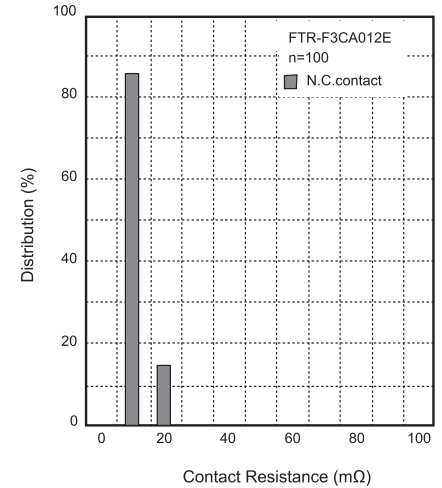
Life Curve



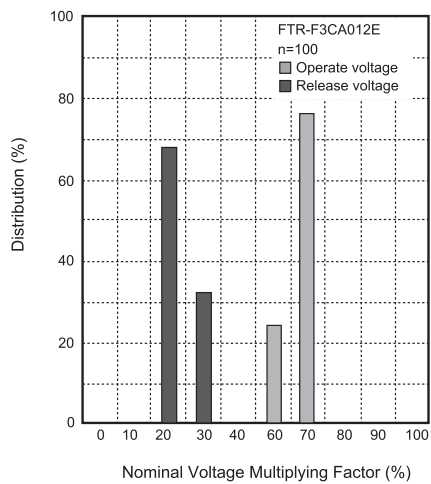
Distribution of Contact Resistance (N.O.)



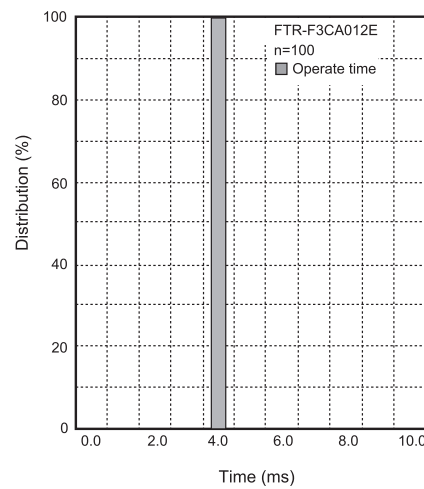
Distribution of Contact Resistance (N.C.)



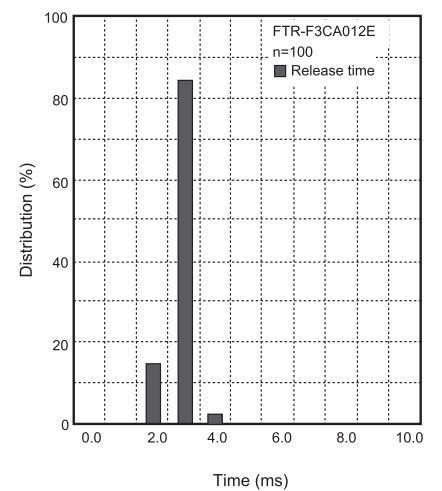
Distribution of Operation & Release Voltage



Distribution of Operation Time



Distribution of Release Time



## 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

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