



# FTR-B4 Series

## ■ PART NUMBERS

Standard type

| Ordering Part Number | Series | Terminal Type                 | Operation                      | Coil Voltage     | Contact Material           |
|----------------------|--------|-------------------------------|--------------------------------|------------------|----------------------------|
| FTR-B4CA1.5Z         | FTR-B4 | C: through hole               | A: mono-stable (standard type) | 1.5              | Z: Au-Ag-Ni<br>P: Au-Ag-Pd |
| FTR-B4CA003Z         |        |                               |                                | 3                |                            |
| FTR-B4CA4.5Z         |        |                               |                                | 4.5              |                            |
| FTR-B4CA006Z         |        |                               |                                | 6                |                            |
| FTR-B4CA009Z         |        |                               |                                | 9                |                            |
| FTR-B4CA012Z         |        |                               |                                | 12               |                            |
| FTR-B4CA024Z         |        |                               |                                | 24               |                            |
| FTR-B4GA1.5Z         |        |                               |                                | G: surface mount |                            |
| FTR-B4GA003Z         |        | 3                             |                                |                  |                            |
| FTR-B4GA4.5Z         |        | 4.5                           |                                |                  |                            |
| FTR-B4GA006Z         |        | 6                             |                                |                  |                            |
| FTR-B4GA009Z         |        | 9                             |                                |                  |                            |
| FTR-B4GA012Z         |        | 12                            |                                |                  |                            |
| FTR-B4GA024Z         |        | 24                            |                                |                  |                            |
| FTR-B4SA1.5Z         |        | S: space saving surface mount |                                |                  |                            |
| FTR-B4SA003Z         |        |                               |                                | 3                |                            |
| FTR-B4SA4.5Z         |        |                               |                                | 4.5              |                            |
| FTR-B4SA006Z         |        |                               |                                | 6                |                            |
| FTR-B4SA009Z         |        |                               |                                | 9                |                            |
| FTR-B4SA012Z         |        |                               |                                | 12               |                            |
| FTR-B4SA024Z         |        |                               |                                | 24               |                            |

# FTR-B4 Series

Latching type (1 coil)

| Ordering Part Number | Series | Terminal Type                 | Operation   | Coil Voltage     | Contact Material           |
|----------------------|--------|-------------------------------|-------------|------------------|----------------------------|
| FTR-B4CB1.5Z         | FTR-B4 | C: through hole               | B: latching | 1.5              | Z: Au-Ag-Ni<br>P: Au-Ag-Pd |
| FTR-B4CB003Z         |        |                               |             | 3                |                            |
| FTR-B4CB4.5Z         |        |                               |             | 4.5              |                            |
| FTR-B4CB006Z         |        |                               |             | 6                |                            |
| FTR-B4CB009Z         |        |                               |             | 9                |                            |
| FTR-B4CB012Z         |        |                               |             | 12               |                            |
| FTR-B4CB024Z         |        |                               |             | 24               |                            |
| FTR-B4GB1.5Z         |        |                               |             | G: surface mount |                            |
| FTR-B4GB003Z         |        | 3                             |             |                  |                            |
| FTR-B4GB4.5Z         |        | 4.5                           |             |                  |                            |
| FTR-B4GB006Z         |        | 6                             |             |                  |                            |
| FTR-B4GB009Z         |        | 9                             |             |                  |                            |
| FTR-B4GB012Z         |        | 12                            |             |                  |                            |
| FTR-B4GB024Z         |        | 24                            |             |                  |                            |
| FTR-B4SB1.5Z         |        | S: space saving surface mount |             |                  |                            |
| FTR-B4SB003Z         |        |                               |             | 3                |                            |
| FTR-B4SB4.5Z         |        |                               |             | 4.5              |                            |
| FTR-B4SB006Z         |        |                               |             | 6                |                            |
| FTR-B4SB009Z         |        |                               |             | 9                |                            |
| FTR-B4SB012Z         |        |                               |             | 12               |                            |
| FTR-B4SB024Z         |        |                               |             | 24               |                            |

## ■ COIL DATA CHART

Standard type

| Coil Voltage | Nominal Voltage (VDC) | Max. Coil Voltage* <sup>1</sup> | Coil Resistance (±10%) | Must Operate Voltage* <sup>2</sup> | Must Release Voltage* <sup>2</sup> | Nominal Power (mW) |
|--------------|-----------------------|---------------------------------|------------------------|------------------------------------|------------------------------------|--------------------|
| 1.5          | 1.5                   | 3.53 VDC                        | 16.1 Ω                 | 1.13 VDC                           | 0.15 VDC                           | 140                |
| 003          | 3                     | 7.05 VDC                        | 64.3 Ω                 | 2.25 VDC                           | 0.3 VDC                            |                    |
| 4.5          | 4.5                   | 10.58 VDC                       | 145 Ω                  | 3.38 VDC                           | 0.45 VDC                           |                    |
| 006          | 6                     | 14.10 VDC                       | 257 Ω                  | 4.5 VDC                            | 0.6 VDC                            |                    |
| 009          | 9                     | 21.15 VDC                       | 579 Ω                  | 6.75 VDC                           | 0.9 VDC                            |                    |
| 012          | 12                    | 28.20 VDC                       | 1,028 Ω                | 9.0 VDC                            | 1.2 VDC                            |                    |
| 024          | 24                    | 56.40 VDC                       | 2,504 Ω                | 18.0 VDC                           | 2.4 VDC                            | 230                |

\*1: No contact current at 20°C. Please see 'operating range' data for other conditions.

\*2: Specified values are subject to pulse wave voltage.

# FTR-B4 Series

Latching type (1 coil)

| Coil Voltage | Nominal Voltage (VDC) | Max. Coil Voltage* <sup>1</sup> | Coil Resistance (±10%) | Must Operate Voltage* <sup>2</sup> | Must Release Voltage* <sup>2</sup> | Set/Re-set current | Nominal Power (mW) |
|--------------|-----------------------|---------------------------------|------------------------|------------------------------------|------------------------------------|--------------------|--------------------|
| 1.5          | 1.5                   | 3.53 VDC                        | 22.5 Ω                 | 1.13 VDC                           | -0.13 VDC                          | 50mA               | 100                |
| 003          | 3                     | 7.05 VDC                        | 90 Ω                   | 2.25 VDC                           | -2.25 VDC                          | 25mA               |                    |
| 4.5          | 4.5                   | 10.58 VDC                       | 203 Ω                  | 3.38 VDC                           | -3.38 VDC                          | 17mA               |                    |
| 006          | 6                     | 14.10 VDC                       | 360 Ω                  | 4.5 VDC                            | -4.5 VDC                           | 13mA               |                    |
| 009          | 9                     | 21.15 VDC                       | 810 Ω                  | 6.75 VDC                           | -6.75 VDC                          | 8mA                |                    |
| 012          | 12                    | 28.20 VDC                       | 1,440 Ω                | 9.0 VDC                            | -9.0 VDC                           | 6mA                | 120                |
| 024          | 24                    | 56.40 VDC                       | 4,800 Ω                | 18.0 VDC                           | -18.0 VDC                          | 4mA                |                    |

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

\*1: No contact current at 20°C. Please see 'operating range' data for other conditions.

\*2: Specified values are subject to pulse wave voltage.

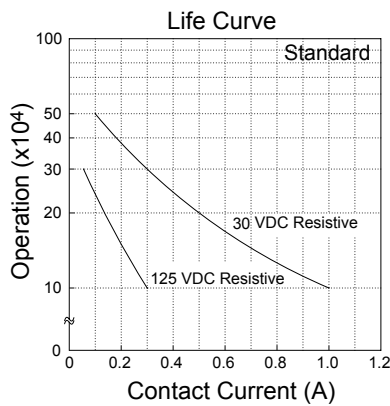
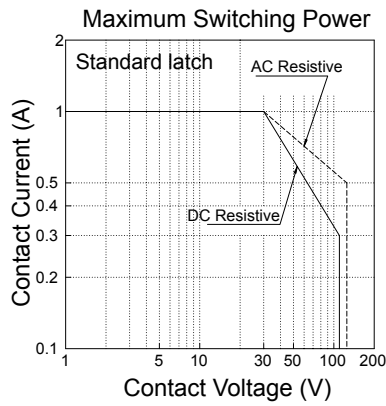
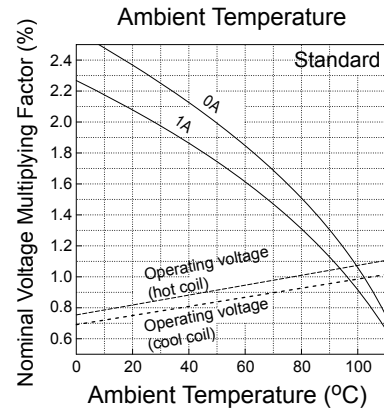
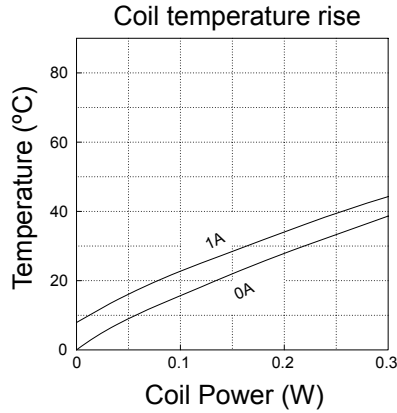
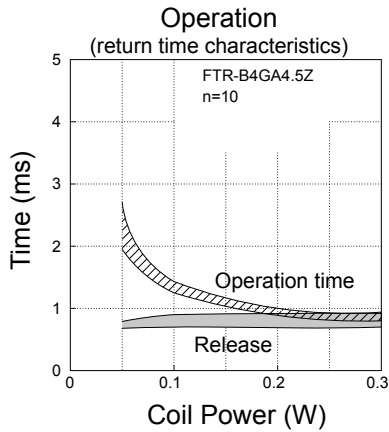
## ■ SPECIFICATIONS

|                      |  | Standard Type  | Latching Type   |
|----------------------|--|--|---|
|                      |  | FTR-B4 ( ) A   | FTR-B4 ( ) B  |
| Contact              | Arrangement                                  | 2 Form C   |   |
|                      | Contact material                             | Gold overlay silver nickel / Gold overlay silver palladium |   |
|                      | Contact type                                 | Bifurcated contact (cross-bar)                             |   |
|                      | Contact resistance (initial value)           | 100mΩ maximum at 6VDC 1                                    |   |
|                      | Contact rating                               | 30 VDC 1A, 125 VAC 0.3 A (resistive)                       |   |
|                      | Maximum carrying current                     | 2A   |   |
|                      | Maximum switching power                      | 62.5 VA / 30W  |   |
|                      | Maximum switching voltage                    | 250 VAC/ 220 VDC   |   |
|                      | Minimum switching load*                      | 10m VDC, 0.01mA*   |   |
| Coil                 | Nominal power (at 20°C)                      | 140 mW up to 230 mW  | 100 mW up to 130 mW   |
|                      | Operate power (at 20°C)                      | 80 mW up to 130 mW   | 57 mW up to 68 mW   |
|                      | Operating temperature (no frost)             | -40°C to +85°C   |   |
| Time value           | Operate (at nominal voltage, without bounce) | 3ms maximum  | 3ms maximum (set)   |
|                      | Release (at nominal voltage, without bounce) | 3ms maximum  | 3ms maximum (reset)   |
| Life                 | Mechanical                                   | 50 x 10 <sup>6</sup> operations                            | 20 x 10 <sup>6</sup> operations                             |
|                      | Electrical (resistive load)                  | DC load  | 100 x 10 <sup>3</sup> ops. min. at 1A, 30 VDC (at 0.5 Hz)   |
|                      |  | AC load  | 100 x 10 <sup>3</sup> ops. min. at 0.3A, 125VAC (at 0.5 Hz) |
| Vibration resistance | Misoperation                                 | 10 to 55 Hz at double amplitude of 3 mm                    |   |
|                      | Endurance                                    | 10 to 55 Hz at double amplitude of 5 mm                    |   |
| Shock resistance     | Misoperation                                 | Min. 750 m/s <sup>2</sup>                                  |   |
|                      | Endurance                                    | Min. 1,000 m/s <sup>2</sup>                                |   |
| Weight               | Approximately 1.0 g                          |  |   |
| US/CSA               | Contact rating                               | 0.5A, 125 VAC; 1A, 30 VDC; 0.3A, 110 VDC                   |   |

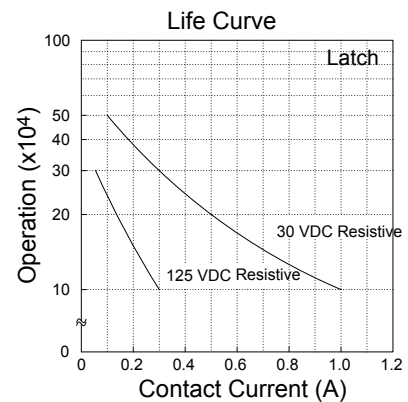
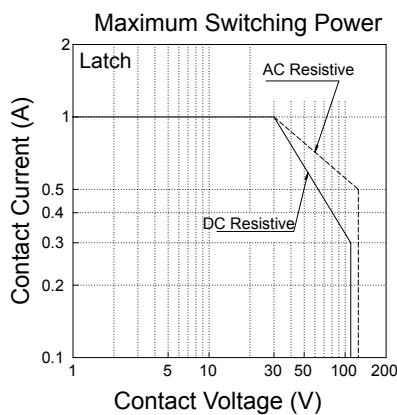
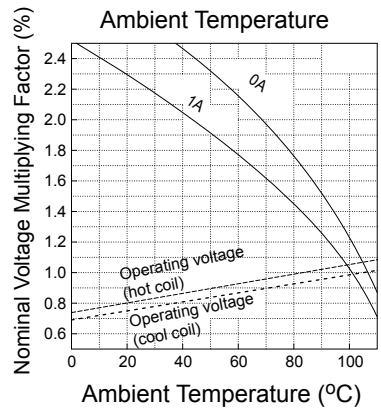
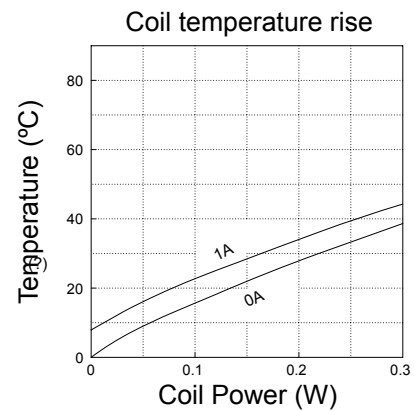
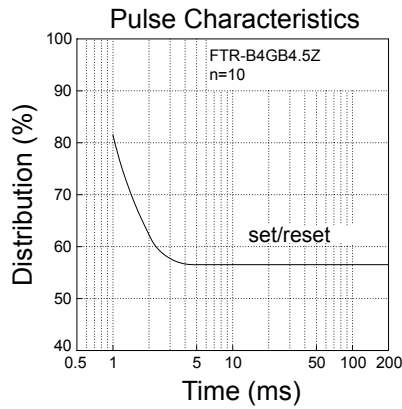
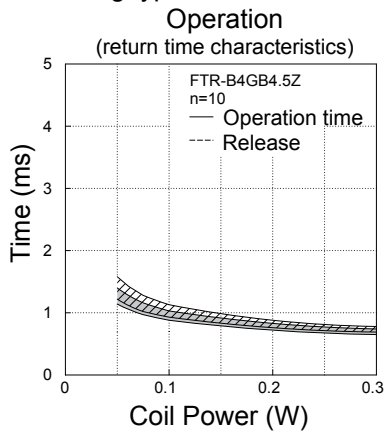
\*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

## CHARACTERISTIC DATA

### Standard type



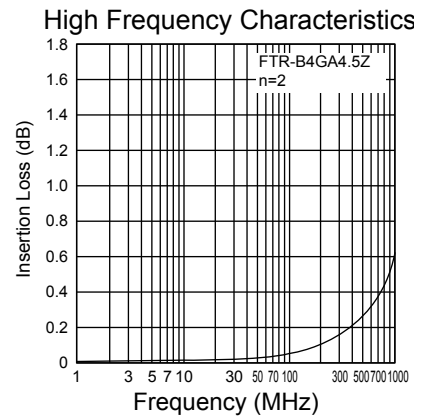
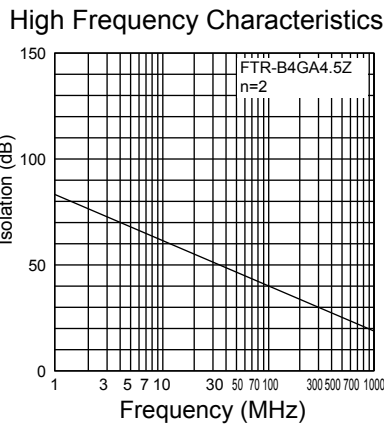
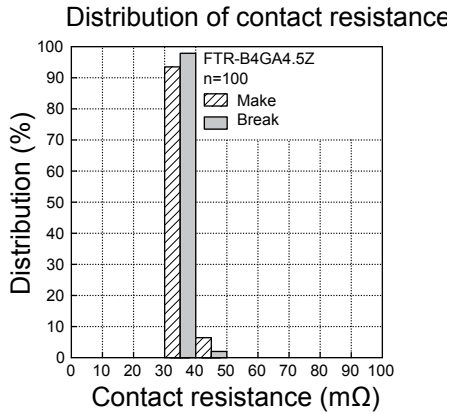
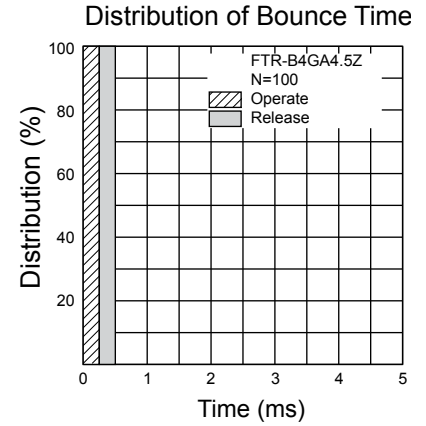
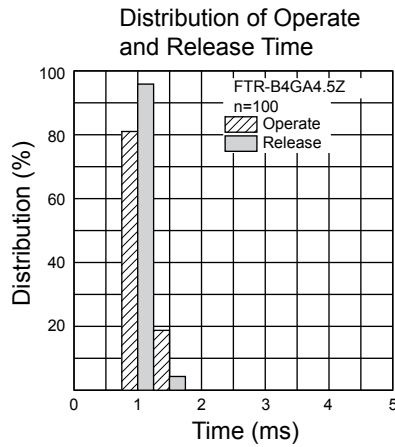
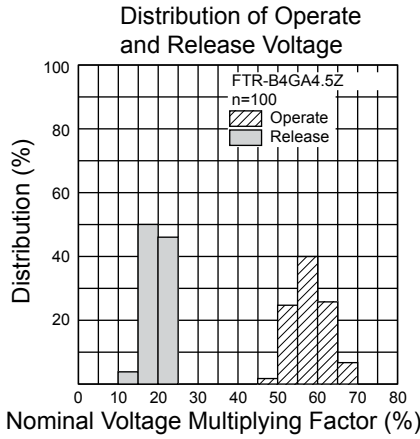
### Latching type



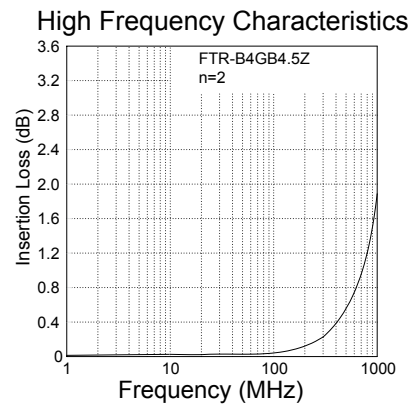
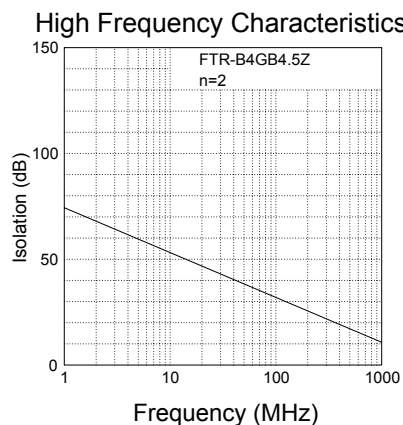
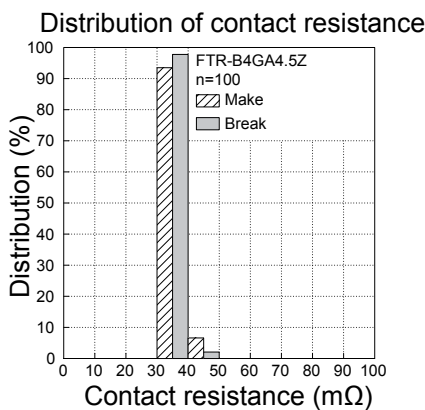
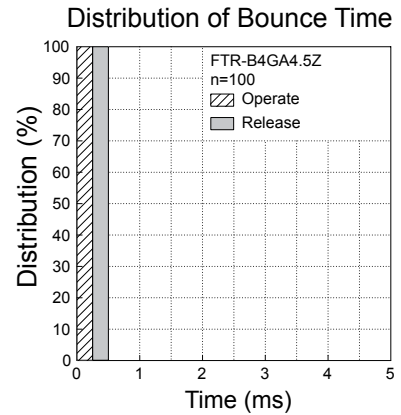
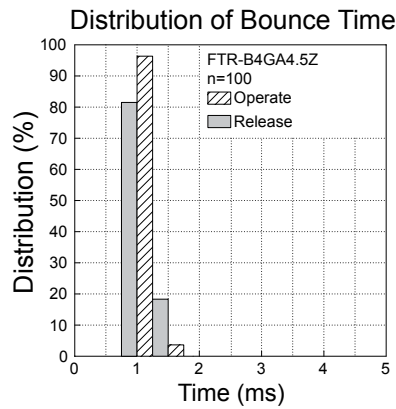
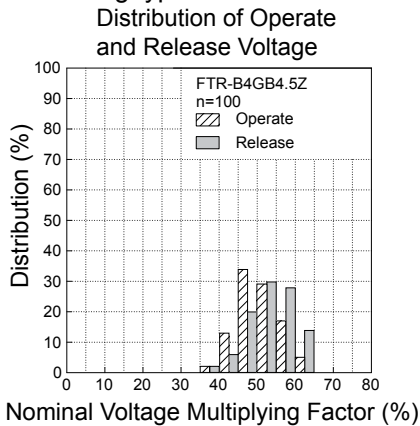
# FTR-B4 Series

## ■ REFERENCE DATA

- Standard type



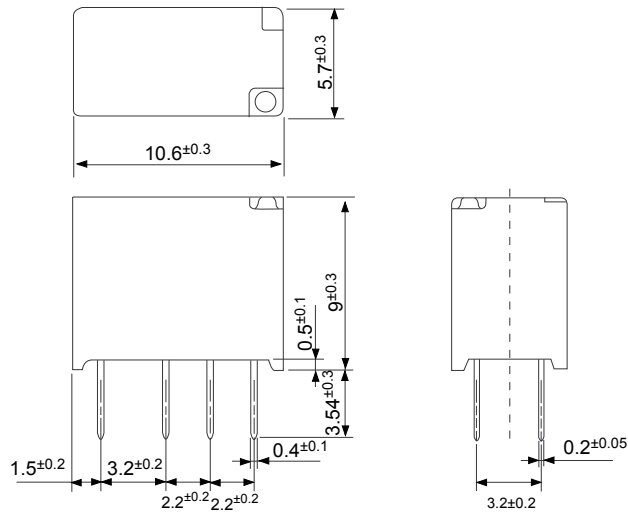
- Latching type



# FTR-B4 Series

## ■ DIMENSIONS AND SCHEMATICS

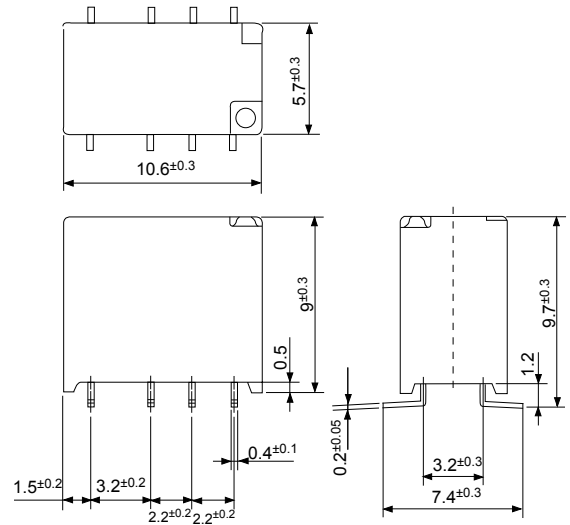
Through hole type



Recommended mounting pad  
(Tolerance:  $\pm 0.1\text{mm}$ )

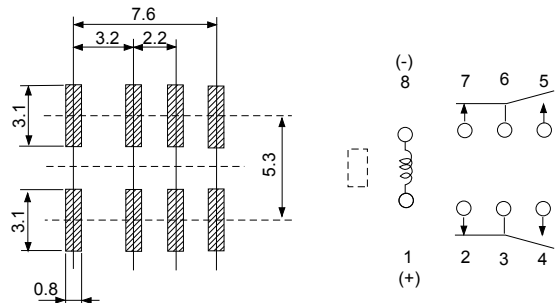
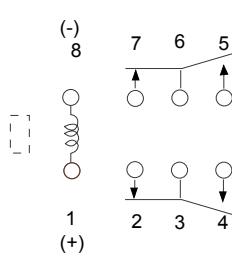
Terminal designations  
(Top view de-energized  
position)

Surface mount type (standard)

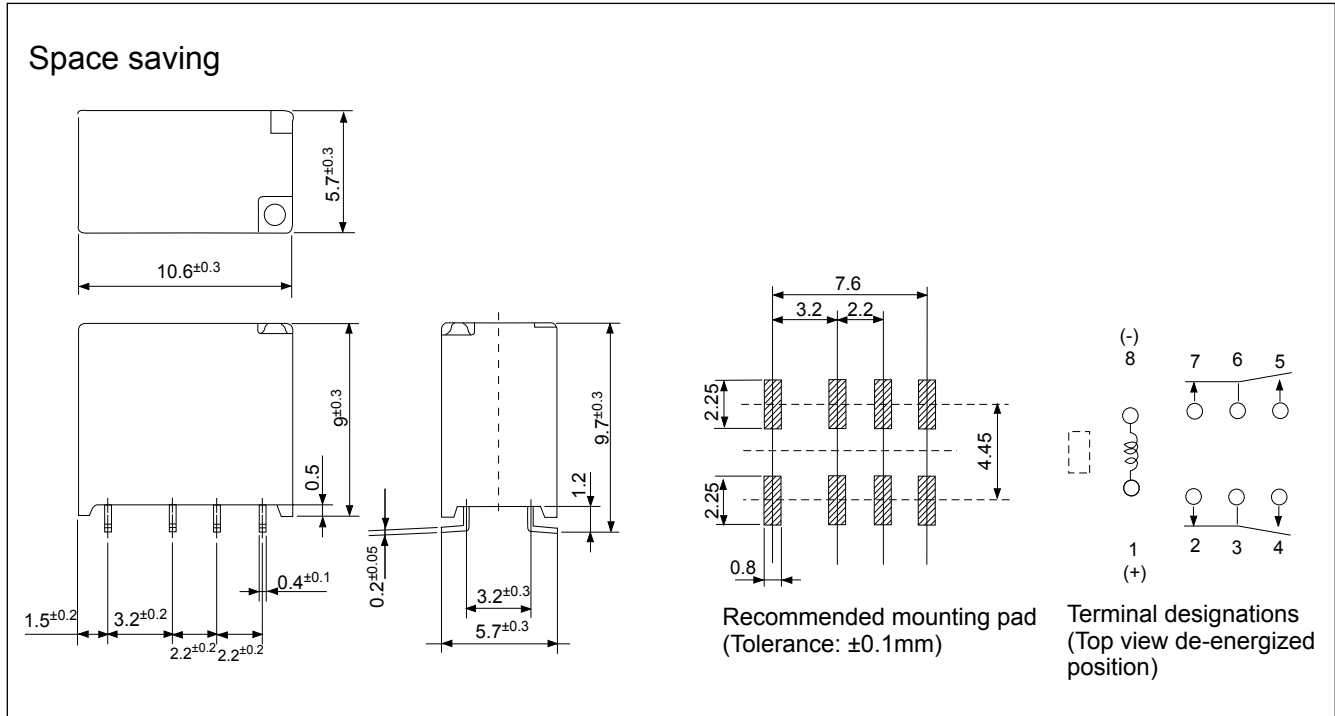


Recommended mounting pad  
(Tolerance:  $\pm 0.1\text{mm}$ )

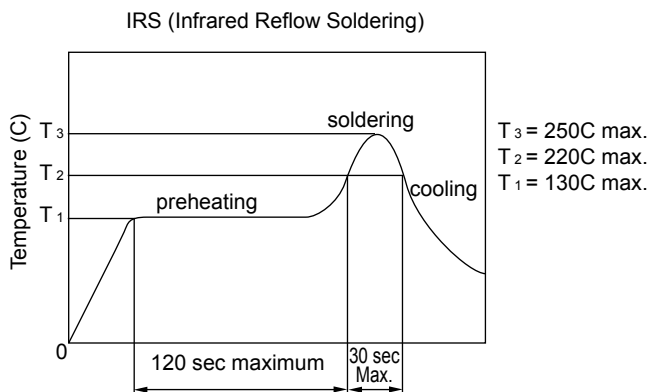
Terminal designations  
(Top view de-energized  
position)



## ■ DIMENSIONS AND SCHEMATICS



## ■ RECOMMENDED SOLDERING CONDITIONS FOR SMT (TEMPERATURE PROFILE)



- 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.

## ■ PRECAUTIONS

- For details on general precautions, refer to the section on technical descriptions.
- Since this is a polarized relay, follow the instructions of the internal wiring diagram for the +/- connections of the coil.
- Note that the terminal layout and internal wiring of the surface mount relay are a top view.
- SMT versions of the FTR-B4 relays have moisture sensitivity level 3, acc. JEDEC-J-STD-020D
- SMT versions of the FTR-B4 relays will be shipped in "Dry Pack". Relays have an "Out of Bag" storage time of 192h.

## RoHS Compliance and Lead Free Relay Information

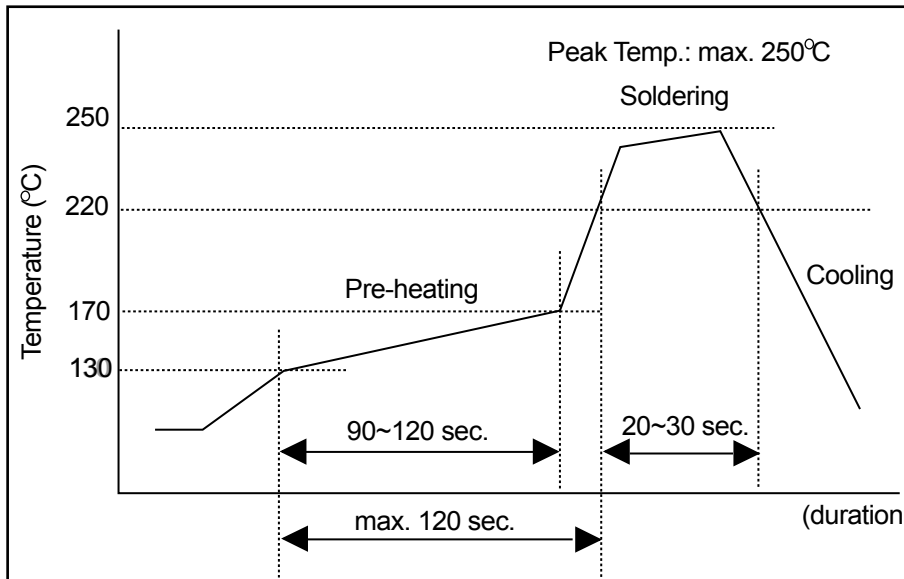
### 1. General Information

- If applicable, relays produced after the specific date code that is indicated on each data sheet are lead-free now. All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
  - Lead free solder plating currently used in relays is Sn-3.0Ag-0.5Cu. From February 2005 forward Sn-3.0Cu-Ni will be used for the FTR-B3 and FTR-B4 series relays.
  - All signal and power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE, decaBDE and PFOS).
  - It has been verified that using lead-free relays in lead assembly process will not cause any problems (compatible).
  - "LF" is marked on each outer and inner carton. (No marking on individual relays).
  - To avoid lead containing relays (for lead-free sample, etc.) please consult with area sales office.
  - We will ship lead containing relays as long as the lead containing relay inventory exists.
- Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

### 2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu or Sn-3.0 Cu-Ni (only FTR-B3 and FTR-B4 from February 2005).

#### Reflow Solder condition



#### 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 is not applicable to electromechanical relays.

### 4. Tin Whisker

- SnAgCu and SnCuNi solder are known as low risk of tin whisker. No considerable whisker length was found by our in-house test.

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