ULTRA MINIATURE RELAY
2 POLES - 2 A (Low Profile Signal Relay)

FTR-B3 Series

■ FEATURES
- DPDT 2C
- Ultra miniature low profile relay with high heat resistant material
- Height: 5.45mm, Weight: 0.85g, Mounting space: 87mm²
- Adopted superior contact spring for high frequency characteristic
- Comply with Telcordia / FCC standard
  - Isolation distance: min. 1.6mm
  - Dielectric strength between coil and contact: 1500VAC
  - Surge strength: 2500V
- Low power: Non-latching: 140mW (230mW at 24V)
  Latching: 100mW (120mW at 24V)
- High reliable bifurcated gold overlay silver contact
- UL, CSA recognized. Confirms to IEC 60950, UL1950, EN60950. Spacing & high breakdown voltage (basic insulation, 150 working volts, pollution degree 2)
- RoHS compliant. Please see page 9 for more information
- Plastic sealed

■ PARTNUMBER INFORMATION

<table>
<thead>
<tr>
<th>Example</th>
<th>FTR-B3</th>
<th>G</th>
<th>B</th>
<th>012</th>
<th>Z</th>
<th>B10</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Relay type</td>
<td>FTR-B3 : FTR-B3-Series</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| (b)     | Terminal type | C : Through hole
|         | | G : Surface mount
|         | | S : Surface mount, space saving |
| (c)     | Coil type | A : Standard type
|         | | B : Latching type (1 coil) |
| (d)     | Coil rated voltage | 012 : 1.5.....24 VDC
|         | | Coil rating table at page 3 |
| (e)     | Contact material | Z : Gold overlay silver nickel
|         | | P : Gold overlay silver palladium |
| (f)     | Packaging | Nil:
|         | | BLO : Tube packaging
|         | | : Tape&Peel packaging (only for surface mount type) |

Remarks: Actual marking on relay would not carry code FTR and be as below:
Ordering code: FTR-B3GB012Z-B10  Actual marking: B3GB012Z
FTR-B3 SERIES

■ SPECIFICATION

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard type</th>
<th>Latching type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FTR-B3 ( ) A</td>
<td>FTR-B3 ( ) B</td>
</tr>
</tbody>
</table>

Contact Data
- Configuration: 2 form C
- Construction: Bifurcated contacts
- Material: Gold overlay silver nickel / Gold overlay silver palladium
- Resistance (initial): Max. 75 mΩ at 1 A, 6 VDC
- Contact rating (resistive): 30VDC, 1A / 125VAC, 0.3A
- Max. carrying current: 2A
- Max. switching voltage: 250 VAC / 220VDC
- Max. switching power: 62.5VA / 30W
- Min. switching load *: 0.01mA, 10mVDC

Life
- Mechanical: Min. 50 x 10^6 operations
- Electrical: Min. 100 x 10^3 operations at 1A 30VDC (at 0.5Hz)

Coil Data
- Rated power: 140mW - 230mW
- Applied pulse width: -
- Operate power: 80mW - 130mW
- Operating temperature range: -40 °C to +85 °C (no frost)

Timing Data
- Operate (at nominal voltage): Max. 3 ms (without bounce)
- Release (at nominal voltage): Max. 3 ms (without bounce)

Insulation
- Resistance (initial): Min. 1,000MΩ at 500VDC
- Dielectric strength
  - Open contacts: 1,000VAC (50/60Hz) 1min
  - Adjacent contacts: 1,000VAC (50/60Hz) 1min
  - Contacts to coil: 1,500VAC (50/60Hz) 1min

Surge strength: Contacts to coil 2,500V, 2 x 10μs standard wave

Clearance
- Open contacts: 0.28 mm
- Adjacent contacts: 1.0 mm
- Contacts to coil: 1.0 mm

Creepage
- Open contacts: 0.28 mm
- Adjacent contacts: 1.0 mm
- Contacts to coil: 1.60 mm

Other
- Vibration resistance: Misoperation 10 to 55 to 10Hz single amplitude 1.65mm
  Endurance 10 to 55 to 10Hz single amplitude 2.5mm
- Shock: Misoperation 750m/s^2
  Endurance 1,000m/s^2
- Weight: Approximately 0.85 g
- Sealing: RT III (plastic sealed)

* 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 RATING

### Standard type

<table>
<thead>
<tr>
<th>Coil Code</th>
<th>Rated Coil Voltage (VDC)</th>
<th>Coil Resistance +/- 10% (Ohm)</th>
<th>Must Operate Voltage (VDC) *</th>
<th>Must Release Voltage (VDC) *</th>
<th>Rated Power (mW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.5</td>
<td>16.1</td>
<td>1.13</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>003</td>
<td>3</td>
<td>64.3</td>
<td>2.25</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td>4.5</td>
<td>145</td>
<td>3.38</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>006</td>
<td>6</td>
<td>257</td>
<td>4.5</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>009</td>
<td>9</td>
<td>579</td>
<td>6.75</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>012</td>
<td>12</td>
<td>1,028</td>
<td>9.0</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>024</td>
<td>24</td>
<td>2,504</td>
<td>18.0</td>
<td>2.4</td>
<td>230</td>
</tr>
</tbody>
</table>

### Latching type (1 coil)

<table>
<thead>
<tr>
<th>Coil Code</th>
<th>Rated Coil Voltage (VDC)</th>
<th>Coil Resistance +/- 10% (Ohm)</th>
<th>Set Voltage (VDC) *</th>
<th>Reset Voltage (VDC) *</th>
<th>Set/Reset current (mA)</th>
<th>Rated Power (mW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.5</td>
<td>22.5</td>
<td>+1.13</td>
<td>-1.13</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>003</td>
<td>3</td>
<td>90</td>
<td>+2.25</td>
<td>-2.25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td>4.5</td>
<td>203</td>
<td>+3.38</td>
<td>-3.38</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>006</td>
<td>6</td>
<td>360</td>
<td>+4.5</td>
<td>-4.5</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>009</td>
<td>9</td>
<td>810</td>
<td>+6.75</td>
<td>-6.75</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>012</td>
<td>12</td>
<td>1,440</td>
<td>+9.0</td>
<td>-9.0</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>024</td>
<td>24</td>
<td>4,800</td>
<td>+18.0</td>
<td>-18.0</td>
<td>4</td>
<td>120</td>
</tr>
</tbody>
</table>

Note: All values in the table are valid for 20°C and zero contact current.
* Specified operate values are valid for pulse wave voltage.

## SAFETY STANDARDS

<table>
<thead>
<tr>
<th>Type</th>
<th>Compliance</th>
<th>Contact rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL</td>
<td>UL 508</td>
<td>Flammability: UL 94-V0 (plastics)</td>
</tr>
<tr>
<td></td>
<td>E 63615</td>
<td>0.5A, 125VAC (resistive)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.3A, 110VDC (General use)</td>
</tr>
<tr>
<td>CSA</td>
<td>C22.2 No. 14 LR 40304-5B</td>
<td>2A, 30VDC (General use)</td>
</tr>
</tbody>
</table>

Comply with Telcordia specifications and FCC part 68 and meet BSI EN60950-1:
Marking only for UL, CSA
CHARACTERISTIC DATA (Reference)

- Standard type
- Latching type

**Operation**
(return time characteristics)

<table>
<thead>
<tr>
<th>FTR-B3GAB.5Z</th>
<th>Operation time</th>
<th>Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pulse characteristics**

<table>
<thead>
<tr>
<th>FTR-B3GAB.5Z</th>
<th>Pulse width (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=10</td>
<td></td>
</tr>
</tbody>
</table>

**Coil temperature rise**

<table>
<thead>
<tr>
<th>1A</th>
<th>0A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FTR-B3 SERIES

- DIMENSIONS

FTR-B3C - Through hole type

- Dimensions

FTR-B3G - Surface mount type

- Dimensions

FTR-B3S - Space saving type

- Dimensions

- Schematics *
  (BOTTOM VIEW)

- PC board mounting hole layout
  (BOTTOM VIEW)

- Schematics *
  (TOP VIEW)

- PC board mounting pad layout
  (TOP VIEW)

* Indicates reset state for latching relays (FTR-B3CB, FTR-B3GB and FTR-B3SB versions)
Indicates non-operate state for standard relays (FTR-B3CA, FTR-B3GA and FTR-B3SA versions)

Unit: mm
FTR-B3 SERIES

■ COIL POLARITY LATCHING TYPE

<table>
<thead>
<tr>
<th>Coil terminal</th>
<th>1</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Reset</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

■ RECOMMENDED SOLDERING CONDITIONS FOR SMT (SEE PAGE 9)
(TEMPERATURE PROFILE)

Notes:
1. Temperature profiles on page 9 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-B3 relays will be shipped in “dry pack”.

■ PACKAGING SPECIFICATIONS

- Packaging method
  - Packaging standard: JIS C 0806
  - Taping type: TB 1612
  - Reel type: R16D
  - Quantity of 1 reel: 1000 pieces

- Packaging orientation code: B

- Reel dimensions

- Tape dimensions

Note:
Relays are sold in 1000 pieces per box. Minimum order quantity is 1000 pieces for tube and tape & reel packing.
RoHS Compliance and Lead Free Information

1. General Information
   - All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU including amendments.
   - Cadmium as used in electrical contacts is exempted from the RoHS directives. As per Annex III of directive 2011/65/EU.
   - 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
   - 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.

2. Recommended Lead Free Solder Condition
   - Recommended solder 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
   - 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.
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