

POWER RELAY

1 POLE—5A (CADMIUM FREE CONTACTS TYPE)

FTR-F2 SERIES

RoHS compliant

■ FEATURES

- HIGH DENSITY MOUNTING
Saves space by 26% compared to FTR-H1 type.
- HIGH ISOLATION
Isolation distance between coil and contacts: 6mm
Dielectric Strength: 4KV
Surge Strength: 10KV
- Sealed type is available
- HEAT RESISTANCE, FLAMMABILITY
Class B (130° C) insulation, flammability 94V-0
- CADMIUM FREE CONTACT FOR ECO-PROGRAM
- SAFETY STANDARDS
UL, CSA, VDE, SEMKO approved
UL/CSA TV-5 rating approved
- RoHS compliant since date code: 0437L2
Please see page 7 for more information



■ ORDERING INFORMATION

[Example] FTR-F2 A K 012 T
 (a) (b) (c) (d) (e)

| | | | |
|-----|---|--|-------------------------------------|
| (a) | Series Name | FTR-F2 series | |
| (b) | Contact Arrangement | A: 1 Form A (SPST-NO) | |
| (c) | Coil Type | K: Standard (530mW) L: High sensitivity (250mW) A: Sealed type (530mW) | |
| (d) | Coil Nominal Voltage/ Contact material | 005: 5DC 006: 6DC 009: 9DC | 012: 12DC 024: 24DC 048: 48DC |
| (e) | TV-Rating | T: Silver tin oxide /TV-5 | |

FTR-F2 Series

■ PART NUMBERS

Standard: 530 mW, High sensitive (250 mW), Sealed (530 mW)

| Ordering Part Number | Series | Contact | Coil Power | Coil Voltage | Contact Material |
|----------------------|--------|----------|-----------------------------------|--------------|----------------------------------|
| FTR-F2AK005T | FTR-F2 | 1 form A | K: 530mW (standard) | 5 | Silver tin oxide (TV-5 rated) |
| FTR-F2AK006T | | | | 6 | |
| FTR-F2AK009T | | | | 9 | |
| FTR-F2AK012T | | | | 12 | |
| FTR-F2AK018T | | | | 18 | |
| FTR-F2AK024T | | | | 24 | |
| FTR-F2AK048T | | | | 48 | |
| FTR-F2AL005T | | | L: 250mW (High sensitivity) | 5 | |
| FTR-F2AL006T | | | | 6 | |
| FTR-F2AL009T | | | | 9 | |
| FTR-F2AL012T | | | | 12 | |
| FTR-F2AL018T | | | | 18 | |
| FTR-F2AL024T | | | | 24 | |
| FTR-F2AL048T | | | | 48 | |
| FTR-F2AA005T | | | A: 530mW (sealed) | 5 | |
| FTR-F2AA006T | | | | 6 | |
| FTR-F2AA009T | | | | 9 | |
| FTR-F2AA012T | | | | 12 | |
| FTR-F2AA018T | | | | 18 | |
| FTR-F2AA024T | | | | 24 | |
| FTR-F2AA048T | | | | 48 | |

■ COIL DATA CHART

Standard Type (530mW)

| Coil Voltage | Nominal Voltage (VDC) | Max. Coil Voltage* ¹ | Coil Resistance (±10%) | Must Operate Voltage* ² | Must Release Voltage* ² |
|--------------|-----------------------|---------------------------------|------------------------|------------------------------------|------------------------------------|
| 005 | 5 | 8.5 VDC | 47 Ω | 3.5 VDC | 0.25 VDC |
| 006 | 6 | 10.2 VDC | 68 Ω | 4.2 VDC | 0.3 VDC |
| 009 | 9 | 15.3 VDC | 155 Ω | 6.3 VDC | 0.45 VDC |
| 012 | 12 | 20.4 VDC | 270 Ω | 8.4 VDC | 0.6 VDC |
| 018 | 18 | 30.6 VDC | 610 Ω | 12.6 VDC | 0.9 VDC |
| 024 | 24 | 40.8 VDC | 1,110Ω | 16.8 VDC | 1.2 VDC |
| 048 | 48 | 81.6 VDC | 4,400 Ω | 33.6 VDC | 2.4 VDC |

FTR-F2 Series

Sensitive Type (250mW)

| Coil Voltage | Nominal Voltage (VDC) | Max. Coil Voltage* ¹ | Coil Resistance (±10%) | Must Operate Voltage* ² | Must Release Voltage* ² |
|--------------|-----------------------|---------------------------------|------------------------|------------------------------------|------------------------------------|
| 005 | 5 | 12.5 VDC | 100 Ω | 4.0 VDC | 0.25 VDC |
| 006 | 6 | 15.0 VDC | 145 Ω | 4.8 VDC | 0.30 VDC |
| 009 | 9 | 22.5 VDC | 325 Ω | 7.2 VDC | 0.45 VDC |
| 012 | 12 | 30.0 VDC | 575 Ω | 9.6 VDC | 0.60 VDC |
| 015 | 15 | 37.5 VDC | 900 Ω | 12.0 VDC | 0.75 VDC |
| 024 | 24 | 60.0 VDC | 2,310 Ω | 19.2 VDC | 1.20 VDC |

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

*1: No contact current at 20°C

*2: Specified values are subject to pulse wave voltage

■ SPECIFICATIONS

| Item | | Standard | | Sensitive | | Sealed | | |
|------------|-----------------------------------|-------------------|--|-------------|--------|-------------|--|--|
| | | F2 AK () T | | F2 AL () T | | F2 AA () T | | |
| Contact | Arrangement | | 1 form A (SPST-NO) | | | | | |
| | Material | | Silver tin oxide | | | | | |
| | Configuration | | Single | | | | | |
| | Resistance (initial) | | Maximum 100 mΩ at 6 VDC, 1 A | | | | | |
| | Rating (resistive) | | 250 VAC / 30 VDC / 5A | | | | | |
| | Maximum Carrying Current | | 5A | | | | | |
| | Maximum Switching Rating | | 1250VA / 150A | | | | | |
| | Maximum Switching Voltage | | 400VAC / 300 VDC | | | | | |
| | Maximum Switching Load*1 | | 100 mA, 5 VDC | | | | | |
| Coil | Nominal Power (20°C) | | 530 mW | | 250 mW | | 530 mW | |
| | Operate Power (20°C) | | 260 mW | | 160 mW | | 260 mW | |
| | Operating Temperature | | -40°C to +70°C (no frost) | | | | | |
| Time Value | Operate Time (at nominal voltage) | | Maximum 15 ms | | | | | |
| | Release Time (at nominal voltage) | | Maximum 5 ms | | | | | |
| Life | Mechanical | | 2 x 10 ⁶ operations minimum | | | | | |
| | Electrical | AC Contact rating | 100 x 10 ³ operations min. | | | | 50 x 10 ³ operations min. | |
| | | DC Contact Rating | 100 x 10 ³ operations minimum | | | | 5 x 10 ³ operations minimum | |
| | | Lamp load (TV-5) | 25 x 10 ³ operations minimum | | | | | |
| Other | Vibration Resistance | Misoperation | 10 to 55 Hz, at double amplitude of 1.5 mm | | | | | |
| | | Endurance | 10 to 55Hz, at double amplitude of 1.5 mm | | | | | |
| | Shock Resistance | Misoperation | Min. 200m/s ² (11±1ms) | | | | | |
| | | Endurance | Min. 1,000m/s ² (11±1ms) | | | | | |
| | Weight | | Approximately 12g | | | | | |

*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.

FTR-F2 Series

■ INSULATION

| Item | FTR-F2 | Note |
|--|-------------------------|-----------------------------|
| Resistance (initial) | Minimum 1,000 MΩ 1 min. | at 500 VDC |
| Dielectric Strength | open contacts | 1,000 VAC (50/60 Hz) 1 min. |
| | coil and contacts | 4,000 VAC (50/60 Hz) 1 min. |
| Surge Voltage (coil and contact) | 10,000 V | 1.2 x 50µs standard wave |
| Clearance/Creepage | 6 mm / 6 mm | |
| Insulation (DIN EN61810-1 VDE0435) | | |
| Voltage | 250 V | |
| Pollution | 2 | |
| Isolation material group | III a | |
| Isolation category / Reference voltage (VDE 0110b) | B / 250 V | |

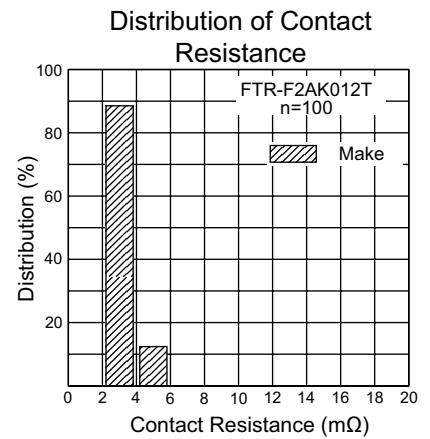
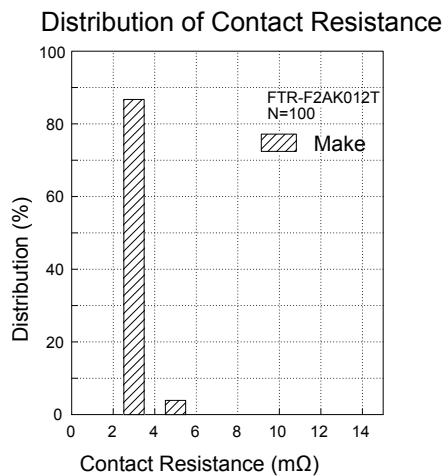
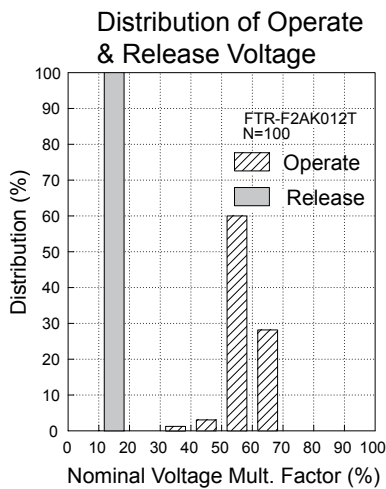
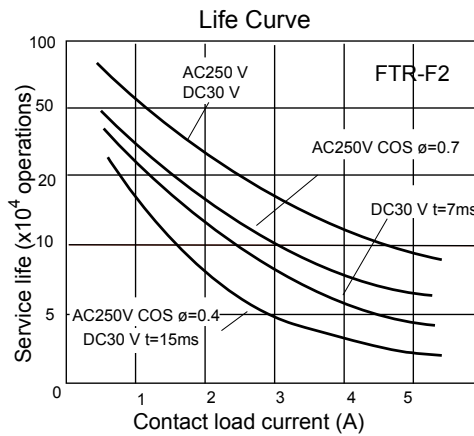
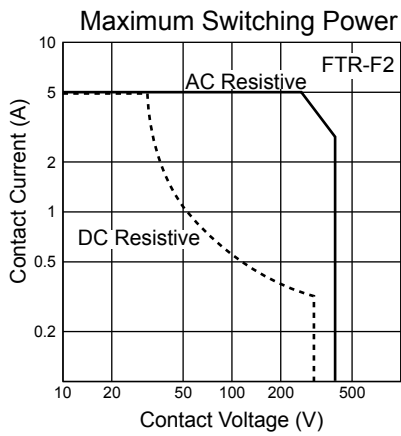
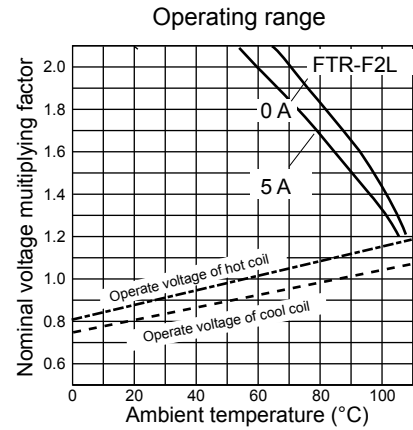
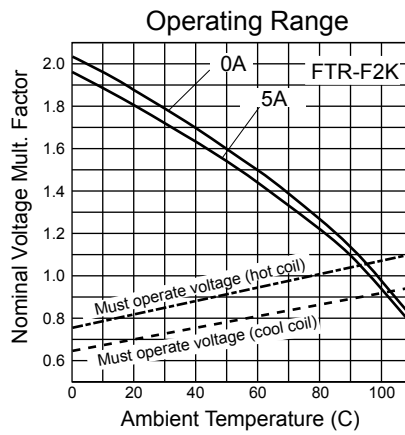
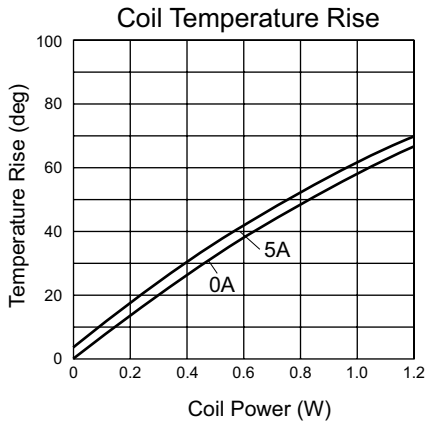
■ SAFETY STANDARDS

| Type | Compliance | Contact rating |
|-------|---|-----------------------------------|
| UL | UL 508 | Flammability: UL 94-V0 (plastics) |
| | E63614 | 5A, 30 VDC/250VAC (resistive) |
| CSA | C22.2 No. 14 | 1/6 HP, 125VAC |
| | LR 40304 | 1/2 HP, 250VAC |
| VDE | 0435, 0860 | TV-5, 120 VAC |
| | | Pilot duty: C300 |
| SEMKO | EN 61058-1: 1992 AND A1 EN 61095:1993 and A1+A11 | 5A, 250 VAC (cosØ=1) |
| | | 2A, 250 VAC cosØ=0.4) |
| | | 5A, 30 VDC (0ms) |
| | | 250 VAC, 5 (1) or 5/80 |
| | | 40T70 |

Complies with CQC, NEMKO, DEMKO, FIMKO,

FTR-F2 Series

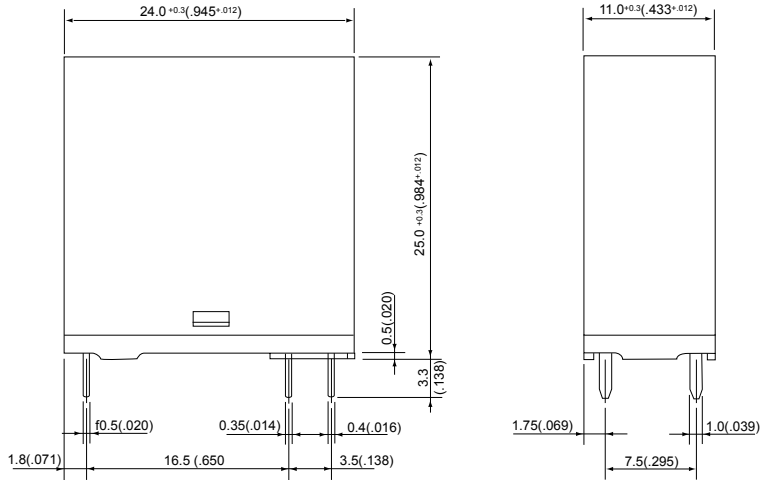
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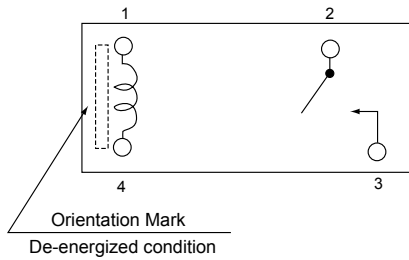
FTR-F2 Series

■ DIMENSIONS

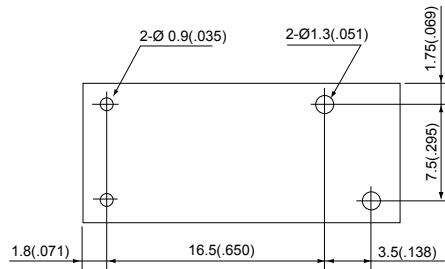
● Dimensions



● Schematics (BOTTOM VIEW)



● PC board mounting hole layout (BOTTOM VIEW)



Unit: mm (in.)

RoHS Compliance and Lead Free Relay Information

1. General Information

- 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 paste currently used in relays is Sn-3.0Ag-0.5Cu.
- 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).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded 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.

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 standard is not applicable to electromechanical relays.

4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. No considerable length whisker was found by our in house test.

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