

# 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)	
FTR-F2AL006T			6		
FTR-F2AL009T			9		
FTR-F2AL012T			12		
FTR-F2AL018T			18		
FTR-F2AL024T			24		
FTR-F2AL048T			48		
FTR-F2AA005T			A: 530mW (sealed)		
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* <sup>1</sup>	Coil Resistance (±10%)	Must Operate Voltage* <sup>2</sup>	Must Release Voltage* <sup>2</sup>
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* <sup>1</sup>	Coil Resistance (±10%)	Must Operate Voltage* <sup>2</sup>	Must Release Voltage* <sup>2</sup>
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 <sup>6</sup> operations minimum					
	Electrical	AC Contact rating	100 x 10 <sup>3</sup> operations min.				50 x 10 <sup>3</sup> operations min.	
		DC Contact Rating	100 x 10 <sup>3</sup> operations minimum				5 x 10 <sup>3</sup> operations minimum	
		Lamp load (TV-5)	25 x 10 <sup>3</sup> 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 <sup>2</sup> (11±1ms)					
		Endurance	Min. 1,000m/s <sup>2</sup> (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	

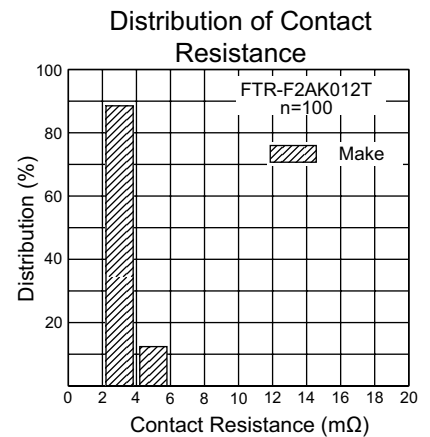
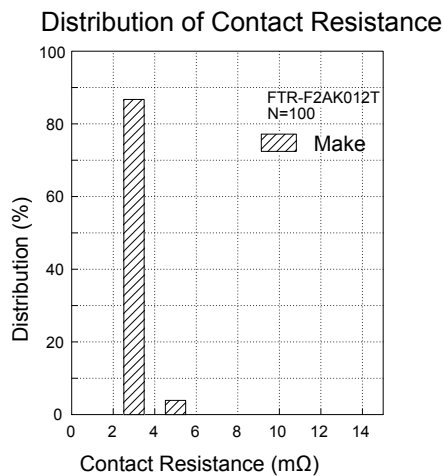
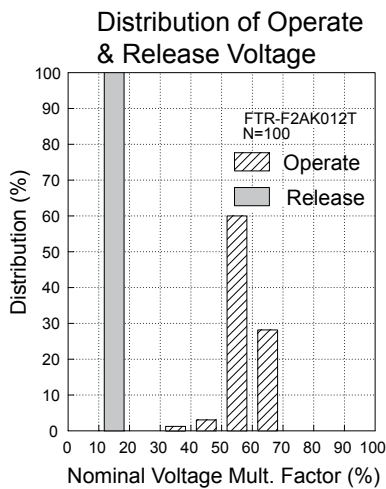
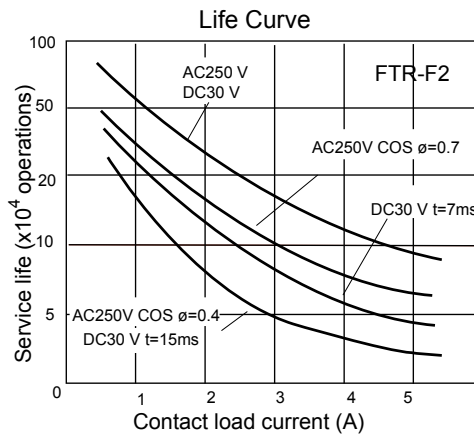
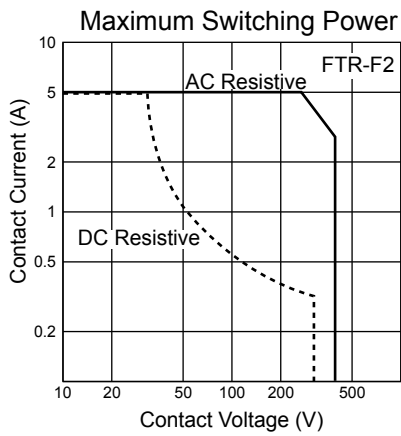
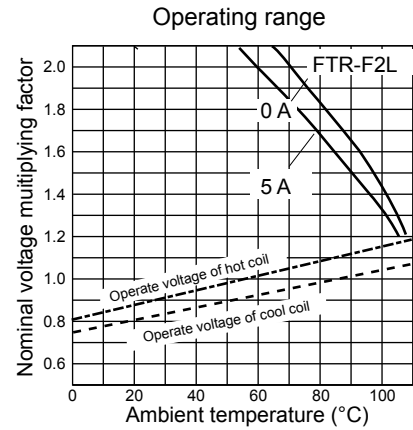
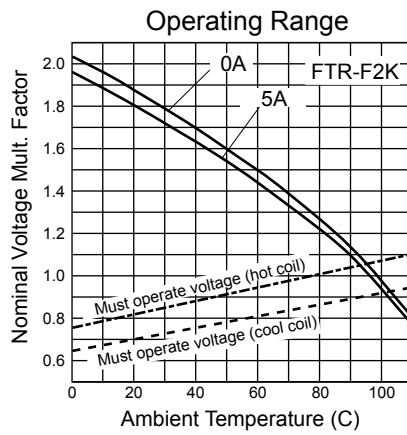
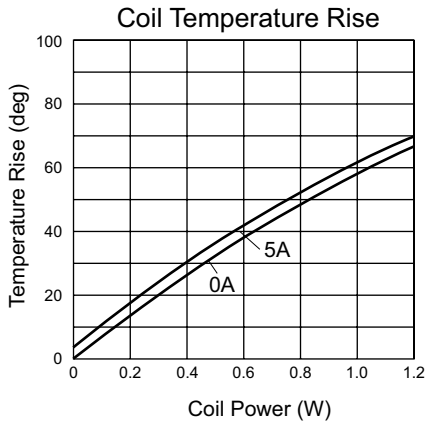
## ■ SAFETY STANDARDS

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

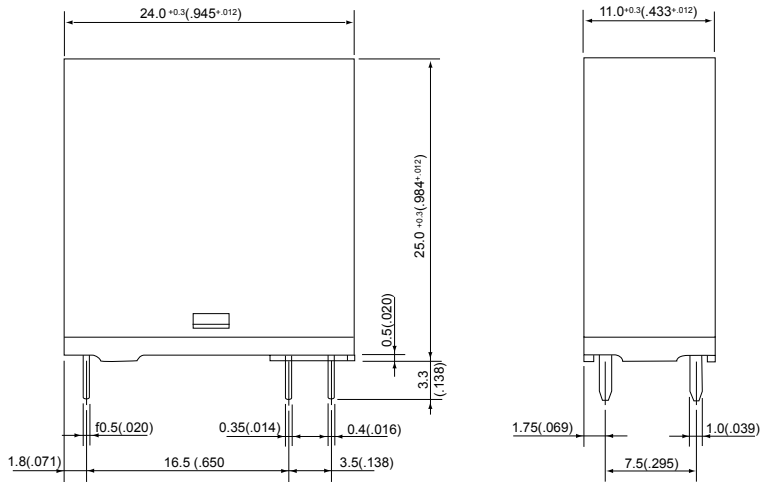
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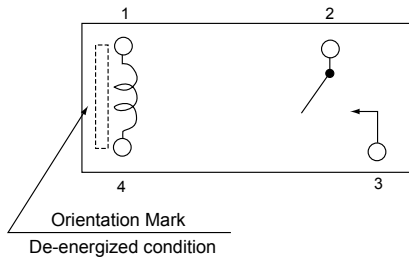
# FTR-F2 Series

## ■ DIMENSIONS

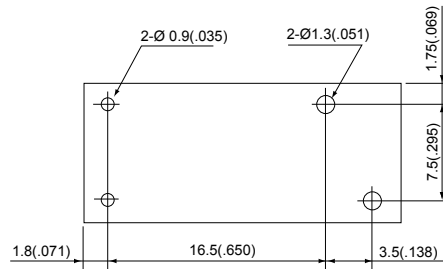
### ● Dimensions



### ● 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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Rev. January 8, 2008.





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