

# POWER RELAY

## 1 POLE - 5A Relay Type

### FTR-F2 Series

#### ■ FEATURES

- High density mounting  
Saves space by 26% compared to FTR-H1 type.
- High insulation  
Insulation distance between coil and contacts: 6mm  
Dielectric Strength: 4KV  
Surge Strength: 10KV
- Flux proof type, RTII
- Flammability 94V-0
- Cadmium free contact for eco-program
- SAFETY STANDARDS  
UL, CSA, VDE, SEMKO approved  
UL/CSA TV-5 rating approved
- RoHS Compliant  
Please see page 5 for more information



#### ■ PARTNUMBER INFORMATION

[Example]      $\frac{\text{FTR-F2}}{\text{(a)}} \quad \frac{\text{A}}{\text{(b)}} \quad \frac{\text{K}}{\text{(c)}} \quad \frac{\text{012}}{\text{(d)}} \quad \frac{\text{T}}{\text{(e)}}$

(a)	Relay type	FTR-F2 : FTR-F2-Series
(b)	Contact configuration	A : 1 form A (SPST-NO)
(c)	Coil type / enclosure	K : Standard type (530mW) L : High sensitivity type (250mW)
(d)	Coil rated voltage	012 : 5.....48 VDC Coil rating table at page 3
(e)	Contact material	T : Silver tin oxide / TV-5

Actual marking does not carry the type name : "FTR"  
E.g.: Ordering code: FTR-F2AK012T     Actual marking: F2AK012T

# FTR-F2 SERIES

## ■ SPECIFICATION

Item			Standard	Sensitive
			F2 AK ( ) T	F2 AL ( ) T
Contact Data	Configuration		1 form A (SPST-NO)	
	Construction		Single	
	Material		Silver tin oxide (AgSnO <sub>2</sub> )	
	Resistance (initial)		Max. 100 mΩ at 6 VDC, 1 A	
	Contact rating		5A, 250VAC / 30VDC	
	Max. carrying current		5A	
	Max. switching voltage		400VAC / 300 VDC	
	Max. switching power		1,250VA / 150A	
	Min. switching load *		100 mA, 5 VDC	
Life	Mechanical		Min. 2 x 10 <sup>6</sup> operations	
	Electrical	AC contact rating	Min. 100 x 10 <sup>3</sup> operations	
		DC contact rating	Min. 100 x 10 <sup>3</sup> operations	
		Lamp load (TV-5)	Min. 25 x 10 <sup>3</sup> operations	
Coil Data	Rated power (at 20 °C)		530mW	250mW
	Operate power (at 20 °C)		260mW	160mW
	Operating temperature range		-40 °C to +70 °C (no frost)	
Timing Data	Operate (at nominal voltage)		Max. 15 ms	
	Release (at nominal voltage)		Max. 5 ms	
Insulation	Resistance (initial)		Min. 1,000MΩ at 500VDC	
	Dielectric strength	Open contacts	1,000VAC (50/60Hz) 1min	
		Contacts to coil	4,000VAC (50/60Hz) 1min	
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave	
	Clearance		6mm	
	Creepage		6mm	
	EN61810-1, VDE0435	Voltage	250V	
		Pollution degree	2	
		Material group	III a	
		Category	B / 250V	
Other	Vibration Resistance	Misoperation	10 to 55Hz double amplitude 1.5mm	
		Endurance	10 to 55Hz double amplitude 1.5mm	
	Shock	Misoperation	Min. 200m/s <sup>2</sup> (11 ± 1ms)	
		Endurance	Min. 1,000m/s <sup>2</sup> (6 ± 1ms)	
	Weight		Approximately 12g	
	Sealing		Flux proof RTII	

\* 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 (530mW)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *	Max. Coil Voltage (VDC)	Rated Power (mW)
005	5	47	3.5	0.25	8.5	530
006	6	68	4.2	0.3	10.2	
009	9	155	6.3	0.45	15.3	
012	12	270	8.4	0.6	20.4	
018	18	610	12.6	0.9	30.6	
024	24	1,110	16.8	1.2	40.8	
048	48	4,400	33.6	2.4	81.6	

Sensitive Type (250mW)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *	Max. Coil Voltage (VDC)	Rated Power (mW)
005	5	100	4	0.25	12.5	250
006	6	145	4.8	0.3	15	
009	9	325	7.2	0.45	22.5	
012	12	575	9.6	0.6	30	
024	24	2,310	19.2	1.2	60	

Note: All values in the tables are valid for 20°C and zero contact current.

\* Specified operate values are valid for pulse wave voltage.

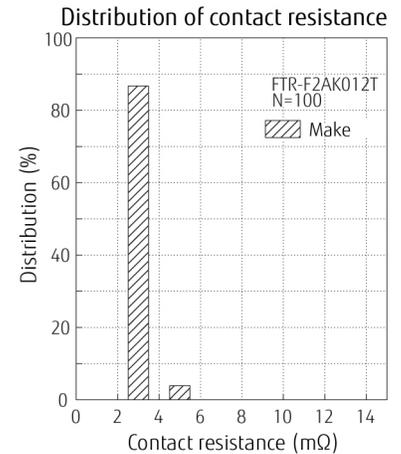
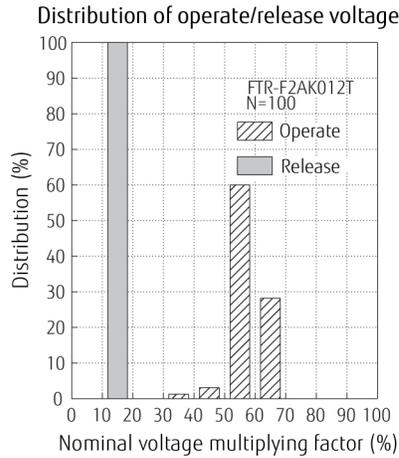
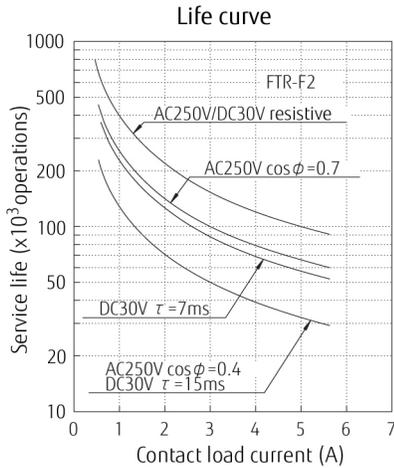
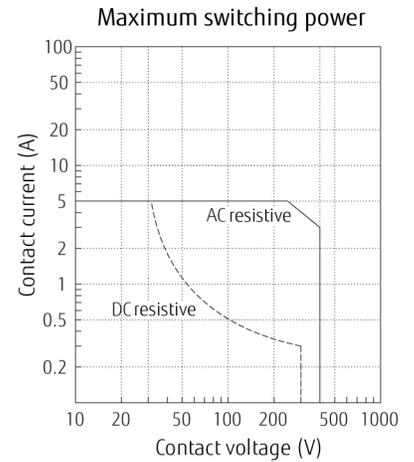
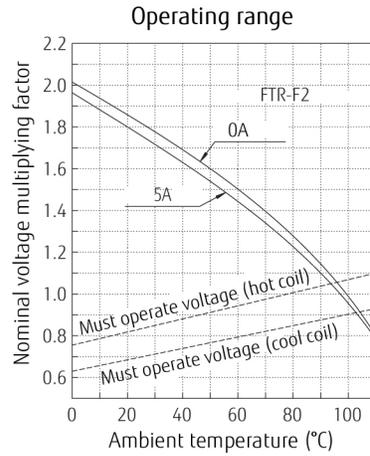
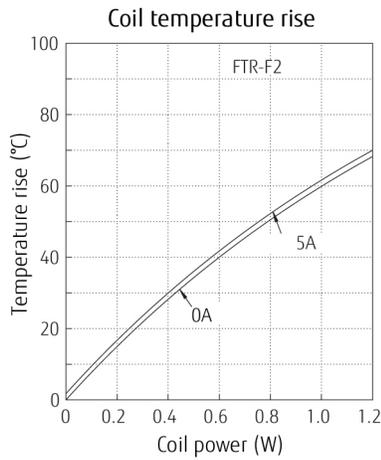
## ■ SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 508	Flammability: UL 94-V0 (plastics)
	E63614	5A, 30 VDC/250VAC (resistive) 1/6 HP, 125VAC
CSA	C22.2 No. 14 LR 40304	1/2 HP, 250VAC TV-5, 120 VAC Pilot duty: C300
VDE	0435, 0860 40014652	5A, 250VAC (cosφ 1) 2A, 250VAC (cosφ 0.4) 5A, 30VDC (0ms)
SEMKO	EN 61058-1: 1992 and A1 EN 61095:1993 and A1+A11	250 VAC, 5 (1) or 5/80 40T70

Complies with CQC, NEMKO, DEMKO, FIMKO

# FTR-F2 SERIES

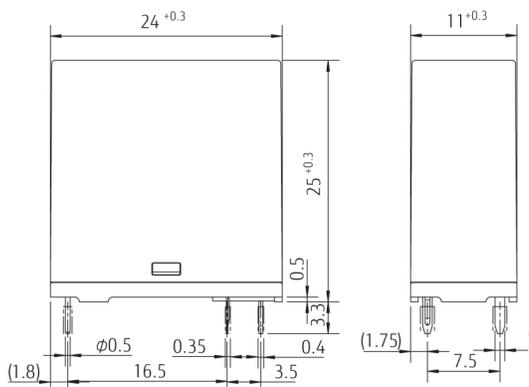
## CHARACTERISTIC DATA



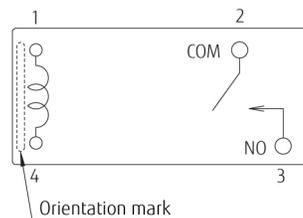
## DIMENSIONS

Unit: mm

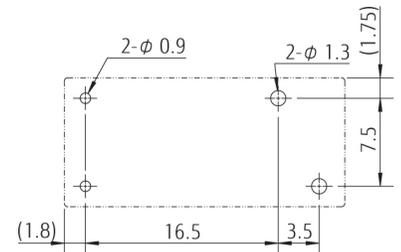
### Dimensions



### Schematics



### PC board mounting hole layout (BOTTOM VIEW)



## RoHS Compliance and Lead Free Information

### 1. General Information

- All signal and power relays produced by Fujitsu Components are compliant with RoHS directive 2002/95EC including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives on October 21st, 2005. (Amendment to Directive 2002/95/EC)
- All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info for older date codes at: <http://www.fujitsu.com/us/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 Profile

- **Recommended solder Sn-3.0Ag-0.5Cu.**

#### 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, 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.

## Fujitsu Components International Headquarter Offices

### Japan

Fujitsu Component Limited  
Gotanda-Chuo Building  
3-5, Higashigotanda 2-chome, Shinagawa-ku  
Tokyo 141, Japan  
Tel: (81-3) 5449-7010  
Fax: (81-3) 5449-2626  
Email: [promothq@ft.ed.fujitsu.com](mailto:promothq@ft.ed.fujitsu.com)  
Web: [www.fcl.fujitsu.com](http://www.fcl.fujitsu.com)

### North and South America

Fujitsu Components America, Inc.  
250 E. Caribbean Drive  
Sunnyvale, CA 94089 U.S.A.  
Tel: (1-408) 745-4900  
Fax: (1-408) 745-4970  
Email: [components@us.fujitsu.com](mailto:components@us.fujitsu.com)  
Web: <http://us.fujitsu.com/components>

### Europe

Fujitsu Components Europe B.V.  
Diamantlaan 25  
2132 WV Hoofddorp  
Netherlands  
Tel: (31-23) 5560910  
Fax: (31-23) 5560950  
Email: [info@fceu.fujitsu.com](mailto:info@fceu.fujitsu.com)  
Web: [emea.fujitsu.com/components/](http://emea.fujitsu.com/components/)

### Asia Pacific

Fujitsu Components Asia Ltd.  
102E Pasir Panjang Road  
#01-01 Citilink Warehouse Complex  
Singapore 118529  
Tel: (65) 6375-8560  
Fax: (65) 6273-3021  
Email: [fcal@fcal.fujitsu.com](mailto:fcal@fcal.fujitsu.com)  
Web: <http://www.fujitsu.com/sg/services/micro/components/>

©2012 Fujitsu Components Europe B.V. All rights reserved. All trademarks or registered trademarks are the property of their respective owners.

The contents, data and information in this datasheet are provided by Fujitsu Component Ltd. as a service only to its user and only for general information purposes.

The use of the contents, data and information provided in this datasheet is at the users' own risk.

Fujitsu has assembled this datasheet with care and will endeavor to keep the contents, data and information correct, accurate, comprehensive, complete and up to date.

Fujitsu Components Europe B.V. and affiliated companies do however not accept any responsibility or liability on their behalf, nor on behalf of its employees, for any loss or damage, direct, indirect or consequential, with respect to this datasheet, its contents, data, and information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof.

Nor do Fujitsu Components Europe B.V. and affiliated companies accept on their behalf, nor on behalf of its employees, any responsibility or liability for any representation or warrant of any kind, express or implied, including warranties of any kind for merchantability or fitness for particular use, with respect to these datasheets, its contents, data, information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof. Rev. March 28, 2012