

# POWER RELAY

## 2 POLES - 5A Low Profile Type

### FTR-F1 Series

#### FEATURES

- Low profile (height: 16.5mm)
- DPST/DPDT 5A
- High insulation  
(due to its reinforced insulation construction)  
Insulation Distance (between coil and contacts): 8mm min.  
Dielectric strength : 5,000 VAC  
Surge strength : 10,000 V
- Pin configuration compatible to VB
- UL, CSA, VDE, CQC recognized
- RoHS compliant (Please see page 6 for more information)



#### Part Numbers

[Example]    FTR-F1        A        A        005        V        -        RG  
                               (a)            (b)            (c)            (d)            (e)            (f)

(a)	Relay type	FTR-F1 : FTR-F1 series
(b)	Contact configuration	A : 2 form A (DPST-NO) C : 2 form C
(c)	Coil type / enclosure	A : Standard type (530mW) D : High sensitivity type (400mW contact material V type only)
(d)	Coil rated voltage	005 : 1.5...110VDC Coil rating table at page 3
(e)	Contact material / TV type	V : Gold plated silver alloy(standard type) T : Gold plated silver alloy (TV-3 rating type, only for 2 form A standard coil type)
(f)	Special type	Nil : Standard type RG : Transparent cover type

Actual marking does not carry the type name "FTR"  
 E.g.: Ordering code: "FTR-F1AA005V", actual marking: "F1AA005V"

# FTR-F1 Series

## ■ Specifications

Item		Standard type F1 (A, C) A ( ) V	TV-3 rating F1 AA ( ) T	Sensitive type F1 (A, C) D ( ) V	Remarks / conditions
Contact data	Configuration	2 form A (DPST-NO) 2 form C	2 form A (DSDT-NO)	2 form A (DPST-NO) 2 form C (DPDT)	
	Construction	Single			
	Material	Movable: Gold plate silver tin oxide (AgSnO <sub>2</sub> ) Stationary: Silver tin oxide			
	Resistance	Max. 100mΩ at 6VDC, 1A			Initial
	Contact rating	5A, 250VAC / 24VDC			Resistive
	Max. carrying current	7A			
	Max. switching voltage	400VAC, 300VDC			
	Max. switching power	1250VA / 120W			
	Min. switching load *1	10 mA, 5VDC			
Coil	Rated power (20°C)	530mW, 110V type: 550mW	400mW		
	Operate power (20°C)	260mW, 110V type: 270mW	225mW		
	Operating temperature range	-40°C ~ +75°C (at rated voltage) -40°C ~ +70°C (Transparent cover type, -RG)		No frost	
Timing data	Operate	Max. 15ms			without bounce, no diode
	Release	Max. 5ms			without bounce, no diode
Life	Mechanical	Min. 20 x 10 <sup>6</sup> operations			
	Electrical (resistive)	AC contact rating	Min. 100 x 10 <sup>3</sup> operations		At rated load
		DC contact rating	Min. 100 x 10 <sup>3</sup> operations		At rated load
		Lamp load (TV-3)	-	25 x 10 <sup>3</sup> operations min.	-
Insulation	Insulation resistance	Min. 1000MΩ at 500VDC			
	Dielectric strength	Open contacts	1000VAC (50/60Hz), 1 minute		
		Coil contact	5000VAC (50/60Hz), 1 minute		
		Adjacent contacts	3000VAC (50/60Hz), 1 minute		
	Surge strength	Coil to contacts	10000V / 1.2 x 50μs standard wave		
	Clearance	8mm			
	Creepage	8mm			
	EN61810-1, VDE0435	Voltage	250V		
		Pollution	3		
		Material group	III a		
Category		C / 250V (reference voltage) (VDE 0110b)			
Other	Vibration resistance	Misoperation	10Hz ~ 55Hz ~ 10Hz single amplitude 0.825mm		
		Endurance	10Hz ~ 55Hz ~ 10Hz single amplitude 1.65mm		
	Shock resistance	Misoperation	Min. 100m/s <sup>2</sup> (11 ± 1ms)		
		Endurance	Min. 1,000m/s <sup>2</sup> (6 ± 1ms)		
	Dimensions / weight	12.8 x 29.0 x 16.5 mm / approx. 12.0g			
	Sealing	Plastic sealed RTIII			

\*1: 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.

# FTR-F1 Series

## ■ Coil Data

530mW standard type

Coil code	Rated Coil Voltage (VDC)	Coil Resistance +/-10%(Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (VDC)	Rated Power (mW)
1.5	1.5	4.2	1.05	0.15	530
005	5	47	3.5	0.5	
006	6	68	4.2	0.6	
009	9	155	6.3	0.9	
012	12	270	8.4	1.2	
018	18	610	12.6	1.8	
024	24	1,100	16.8	2.4	
048	48	4,400	33.6	4.8	
060	60	6,800	42.0	6.0	
110	110	22,000	77.0	11.0	550

400mW high sensitive type

Coil code	Rated Coil Voltage (VDC)	Coil Resistance +/-10%(Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (VDC)	Rated Power (mW)
1.5	1.5	5.6	1.125	0.15	400
003	3	22.5	2.25	0.3	
005	5	62	3.75	0.5	
006	6	90	4.5	0.6	
009	9	202	6.75	0.9	
012	12	360	9	1.2	
024	24	1,440	18	2.4	
048	48	5,760	36	4.8	

Note: All values in the table are valid at 20°C and zero contact current, unless otherwise specified.

\*: Specified operated values are valid for pulse wave voltage.

Note: Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

Care shall be taken on the heat generated on PC board when maximum carrying current exceeds 10A. Please perform the confirmation test with actual conditions.

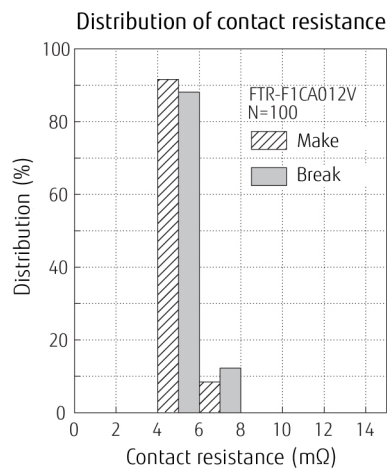
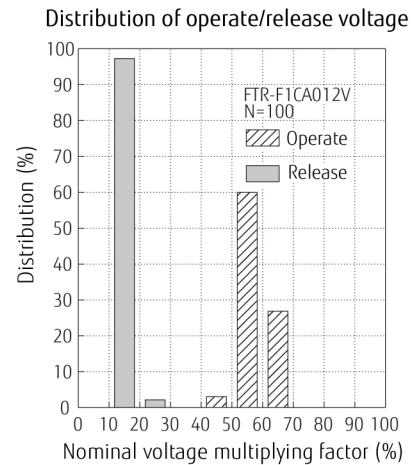
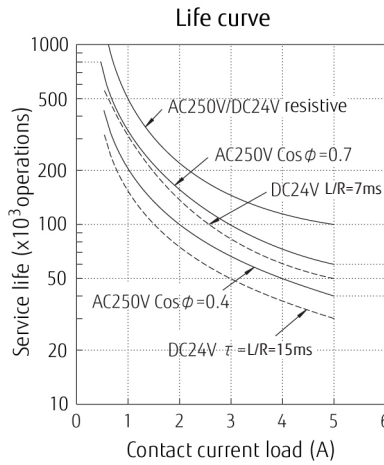
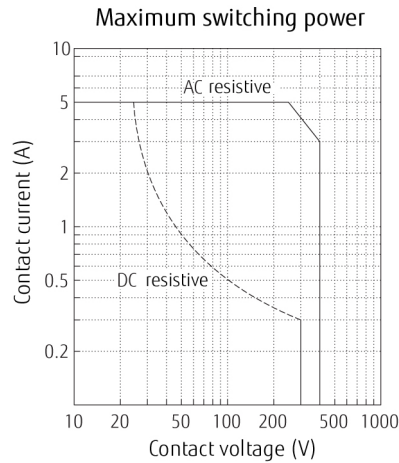
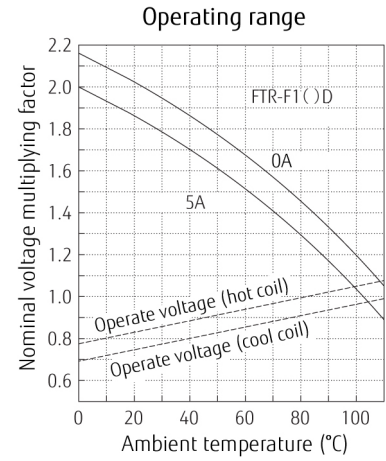
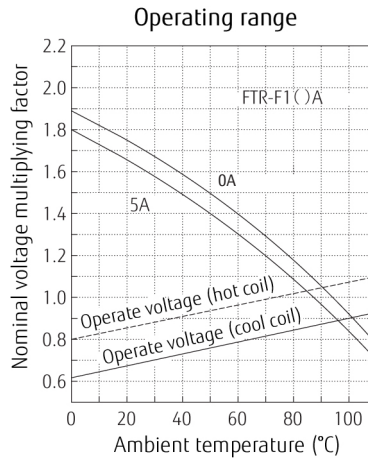
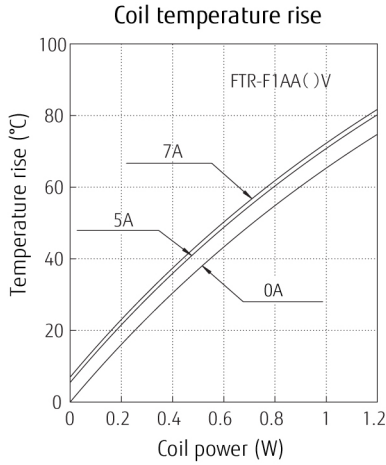
## ■ Safety Standards

Type	Compliance	Contact rating
UL	UL 508	Flammability: UL 94-V-0 (plastics)
CSA	C22.2 No. 14 File No. LR 40304	5A, 24VDC (resistive) 5A, 250VAC (resistive) 1/6 hp, 125VAC 1/4 hp, 250VAC Pilot duty: C300 Pilot duty: R300 (FTR-F1CA( )V) TV-3 (FTR-F1AA( )T) (except for -RG type)
VDE	IEC/EN61810-1 EN60065 clause 14.6.1 (FTR-F1AA( )T) EN60335-1 clause 15.3; 16.3; 29.1; 29.2; 29.3 EN60730-1 clause 12.2; 13.2; 20.1; 20.2; 20.3	5A, 250 VAC (cosφ=1) 2A, 250 VAC (cosφ=0.4) 5A, 24VDC (0ms) 2A/32A, 250VAC (FTR-F1AA( )T)
CQC	GB/T21711.1, GB15092.1 (No.17002164350)	5A, 250VAC (FTR-F1CA( )V)

# FTR-F1 Series

## Characteristic Data (Reference)

\* Characteristic data is not a guaranteed value, but measured values of samples from production line.

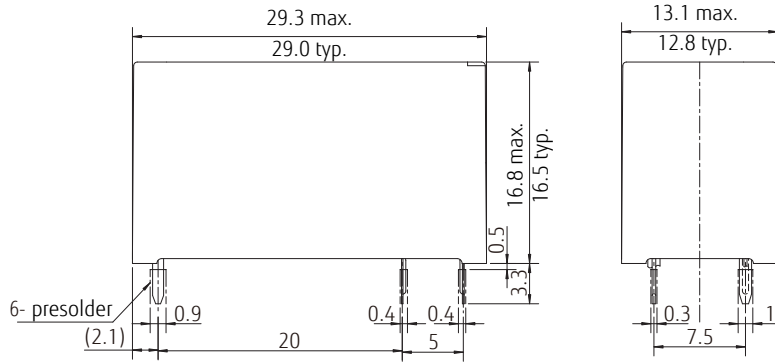


# FTR-F1 Series

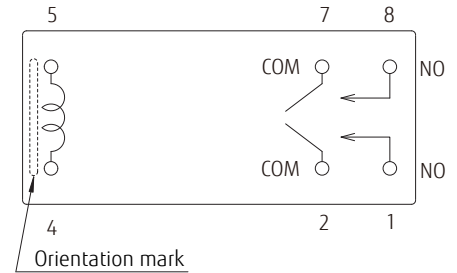
## ■ Dimensions

### FTR-F1A Type

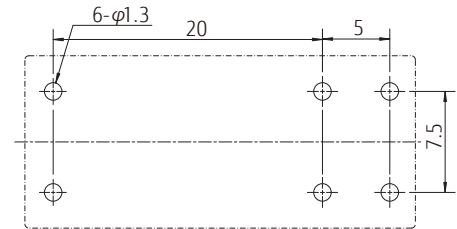
#### Dimensions



#### Schematics (BOTTOM VIEW)

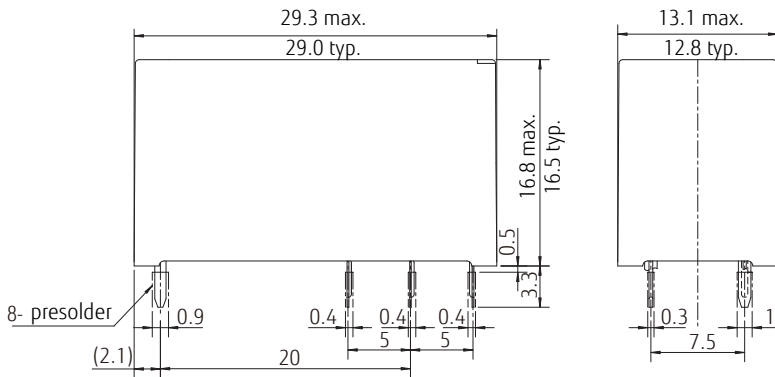


#### PC board mounting hole layout (BOTTOM VIEW)

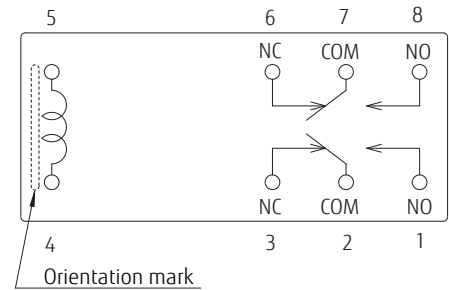


### FTR-F1C Type

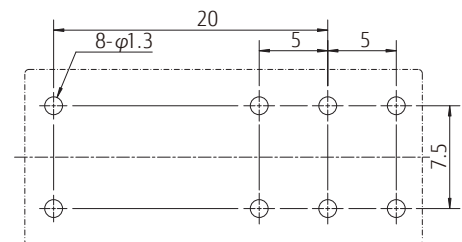
#### Dimensions



#### Schematics (BOTTOM VIEW)



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



- \* Dimensions do not include tolerances.
- \* Dimensions of the terminals do not include thickness of pre-solder.
- \* Tolerance of PC board mounting hole layout :  $\pm 0.1$  unless otherwise specified.

Unit: mm  
( ): Reference

# FTR-F1 Series

## CAUTIONS

- All values mentioned in this datasheet are provided under ideal conditions. Please perform the confirmation test before actual use.
- Reflow soldering is prohibited.
- Do not use relays in the atmosphere with sulfide gas, chloride gas or nitric oxide. Contact resistance may increase.
- Do not use silicon or silicon-containing product or materials near relays. It may cause contact failure.

## GENERAL INFORMATION

### 1. ROHS Compliance

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU, including commission delegated directive 2015/863.

### 2. Recommended lead free solder condition

- 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.
- Recommended solder for assembly: Sn-3.0Ag-0.5Cu.

#### Flow Solder Condition:

Pre-Heating: Maximum 120°C within 90 sec.

Soldering: Eip within 5 sec. at 255°C±5°C solder bath

Relay must be cooled by air immediately after soldering

#### Solder by Soldering Iron:

Soldering Iron: 30-60W

Temperature: Maximum 340-360°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.

# FTR-F1 Series

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## Contact

### Japan

FUJITSU COMPONENT LIMITED  
Shinagawa Seaside Park Tower  
12-4, Higashi-shinagawa 4-chome,  
Tokyo 140 0002, Japan  
Tel: (81-3) 3450-1682  
Email: fcl-contact@cs.fcl-components.com

### North and South America

FUJITSU COMPONENTS AMERICA  
350 Cobalt Way, M/S 160  
Sunnyvale, CA 94085 U.S.A.  
Tel: (1-408) 745-4900  
Email: components@gr.fcl-components.com

### Europe

FUJITSU COMPONENTS EUROPE  
Diamantlaan 25  
2132 WV Hoofddorp, Netherlands  
Tel: (31-23) 5560910  
Email: info.fceu@cs.fcl-components.com

### Asia Pacific

FUJITSU COMPONENTS ASIA.  
No. 20 Harbour Drive, #07-01B  
Singapore 117612  
Tel: (65) 6375-8560  
Email: fcal@fcl-components.com

### China

FUJITSU ELECTRONIC COMPONENTS  
(SHANGHAI)  
Unit 4306, InterContinental Center  
100 Yu Tong Road, Shanghai 200070, China  
Tel: (86 21) 3253 0998  
Email: fcsh@fcl-components.com

### Hong Kong

FUJITSU COMPONENTS HONG KONG  
Room 13, 23/F, Seapower Tower, Concordia  
Plaza, No.1 Science Museum Road, Tsim  
Sha Tsui East, Kowloon, Hong Kong  
Tel: (852) 2881 8495  
Email: fcal@fcl-components.com

### Korea

FUJITSU COMPONENTS KOREA  
Alpha Tower #403, 645 Sampyeong-dong,  
Bundang-gu, Seongnam-si, Gyeonggi-do, 13524 Korea  
Tel: (82 31) 708-7108  
Email: fcal@fcl-components.com

**Web:** [www.fcl.fujitsu.com/en/](http://www.fcl.fujitsu.com/en/)

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