

# 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]  $\frac{\text{FTR-F1}}{\text{(a)}} - \frac{\text{A}}{\text{(b)}} \frac{\text{A}}{\text{(c)}} \frac{\text{005}}{\text{(d)}} \frac{\text{V}}{\text{(e)}} - \frac{\text{RG}}{\text{(f)}}$

(a)	Relay type	FTR-F1 : FTR-F1 series
(b)	Contact configuration	A : 2 form A (SPST-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 nameL "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		Flux proof RTII				

\*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% ( $\Omega$ )	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	

400mW high sensitive type

Coil code	Rated Coil Voltage (VDC)	Coil Resistance +/-10% ( $\Omega$ )	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.

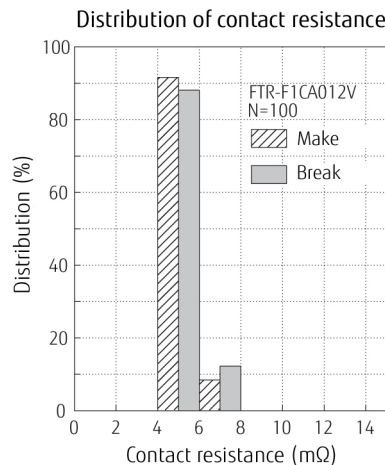
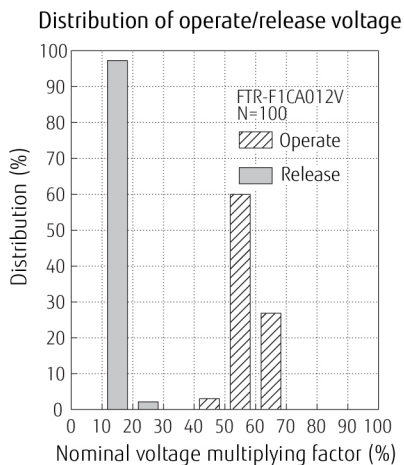
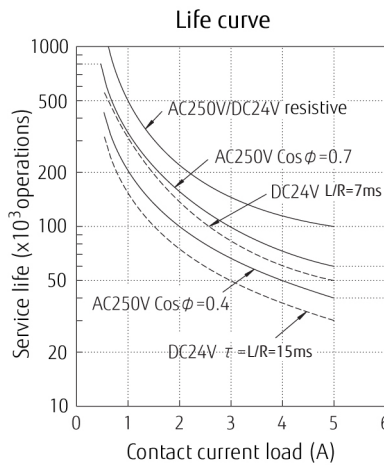
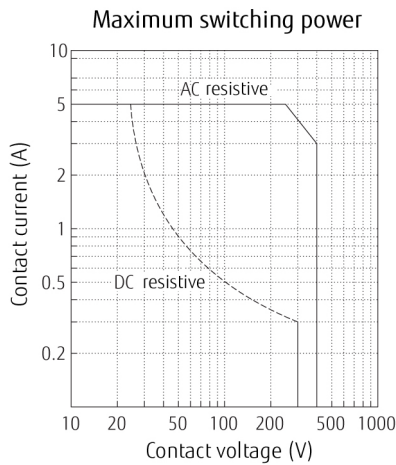
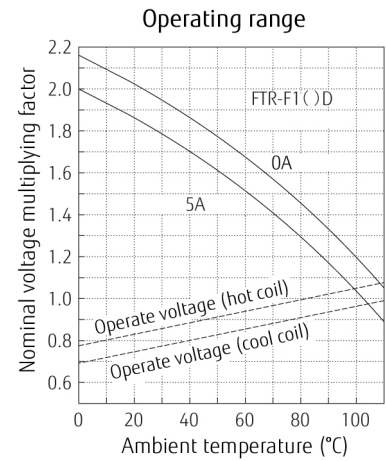
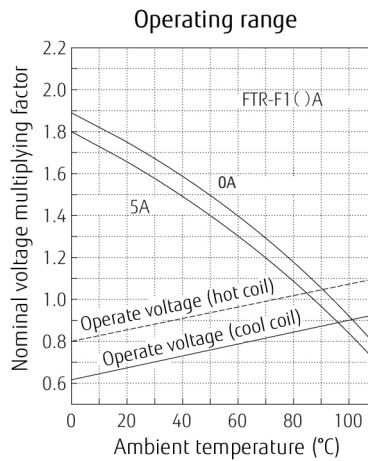
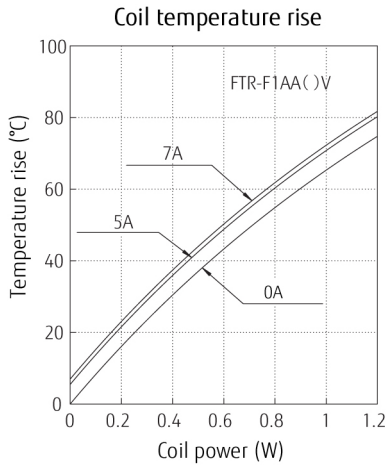
## ■ Safety Standards

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 ( $\cos\phi=1$ ) 2A, 250 VAC ( $\cos\phi=0.4$ ) 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.

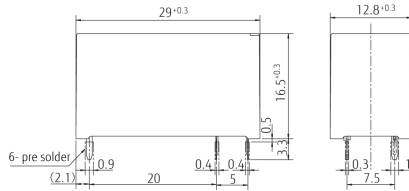


# FTR-F1 Series

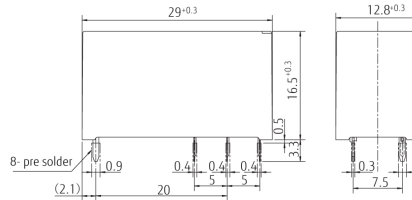
## ■ Dimensions

- Dimensions

FTR-F1A type



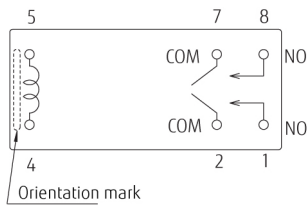
FTR-F1C type



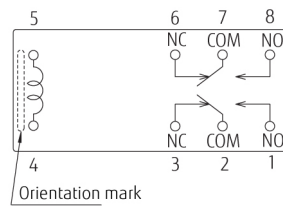
\* Dimensions of the terminals do not include thickness of pre-solder.

- Schematics  
(BOTTOM VIEW)

FTR-F1A

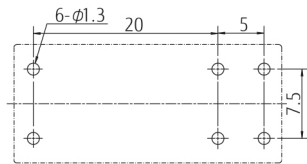


FTR-F1C

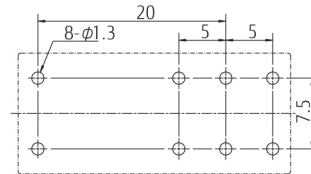


- PC Board Mounting Hole Layout  
(BOTTOM VIEW)

FTR-F1A



FTR-F1C



( ): Reference value

Unit: mm

\* Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.

## 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.

# FTR-F1 Series

## GENERAL INFORMATION

### 1. ROHS Compliance

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU including amendments.
- Use of Cadmium in electrical contacts is exempted as per Annex III of the RoHS directive 2011/65/EU. Please consider expiry date of exemption. Relays with Cadmium containing contacts are not to be used for new designs.
- 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>
- Characteristic data is not guaranteed values, but measured values of samples from production line.

### 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: dip 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 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.

# FTR-F1 Series

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