

# POWER RELAY

## 2 POLES - 5A LOW PROFILE TYPE

### FTR-F1 Series

#### ■ FEATURES

- Low profile (height: 16.5mm)
  - DPST/DPDT 5A, TV-3 rating available
  - High insulation  
(due to its reinforced insulation construction)  
Insulation Distance (between coil and contacts): 8mm min.  
Dielectric strength: 5KV  
Surge strength: 10KV
  - Pin configuration compatible to VB
  - UL, CSA, VDE, SEMKO, CQC recognized
  - Plastic sealed, RT III
  - RoHS Compliant
- Please see page 6 for more information



#### ■ PARTNUMBER INFORMATION

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

(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)
(d)	Coil rated voltage	005 : 5...110VDC Coil rating table at page 3
(e)	Contact material / TV type	V : Gold plate silver tin oxide (standard type) T : Gold plate silver tin oxide (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

## ■ SPECIFICATION

Item			Standard Type F1 (A,C) A ( ) V	TV-3 rating F1 AA ( ) T	Sensitive Type F1 (A,C) D ( ) V
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		Gold plate silver tin oxide (AgSnO <sub>2</sub> )		
	Resistance (initial)		Max. 100mOhm at 1A, 6VDC		
	Contact rating		5A, 250VAC / 24VDC		
	Max. carrying current *1		7A		
	Max. switching voltage		400VAC/ 300VDC		
	Max. switching power		1,250VA, 120W		
	Min. switching load *2		10mA, 5VDC		
Life	Mechanical		Min. 20 x 10 <sup>6</sup> operations		
	Electrical	AC load	Min. 100 x 10 <sup>3</sup> operations		
		DC load	Min. 100 x 10 <sup>3</sup> operations		
		Lamp load (TV-3)	-	25 x 10 <sup>3</sup> operations min.	-
Coil Data	Rated Power (at 20 ° C)		530mW, 110V type: 550mW		400mW
	Operate Power (at 20 ° C)		260mW, 110V type: 270mW		225mW
	Operating temperature range		-40 to +75 °C (no frost) -40 to +70 °C (transparent cover type, -RG)		
Timing Data	Operate (at nominal voltage)		Max. 15ms (no diode, without bounce)		
	Release (at nominal voltage)		Max. 5ms (no diode, without bounce)		
Insulation	Resistance (Initial)		Min. 1,000MOhm at 500VDC		
	Dielectric strength	Open contacts	1,000VAC (50/60Hz) 1min.		
		Coil and contacts	5,000VAC (50/60Hz) 1min.		
		Adjacent contacts	3,000VAC (50/60Hz) 1 min.		
	Surge strength	Coil and contacts	10.000V/ 1.2 x 50μs standard wave		
	Clearance		8 mm		
	Creepage		8 mm		
	EN61810-1, VDE0435	Voltage	250V		
		Pollution degree	3		
	Material group	IIIa			
	Category	C / 250V (reference voltage) (VDE0110b)			
Other	Vibration Resistance	Misoperation	10 to 55Hz double amplitude 1.65mm		
		Endurance	10 to 55Hz double amplitude 3.3mm		
	Shock	Misoperation	Min. 100m/s <sup>2</sup> (11 ± 1ms)		
		Endurance	Min. 1000m/s <sup>2</sup> (6 ± 1ms)		
	Weight		Approximately 13 g		
	Sealing		Sealed RTIII		

\* 1 When max. carrying current is more than 10A, PCB layout needs to be considered.

\* 2 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 RATING

530mW standard type

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	0.5	8.5	530
006	6	68	4.2	0.6	10.2	
009	9	155	6.3	0.9	15.3	
012	12	270	8.4	1.2	20.4	
018	18	610	12.6	1.8	30.6	
024	24	1,100	16.8	2.4	40.8	
048	48	4,400	33.6	4.8	81.6	
060	60	6,800	42	6	102	550
110	110	22,000	77	11	187	

400mW high sensitive type

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)
003	3	22.5	2.25	0.3	6	400
005	5	62	3.75	0.5	10	
006	6	90	4.5	0.6	12	
009	9	202	6.75	0.9	18	
012	12	360	9	1.2	24	
024	24	1,440	18	2.4	48	
048	48	5,760	36	4.8	96	

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

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

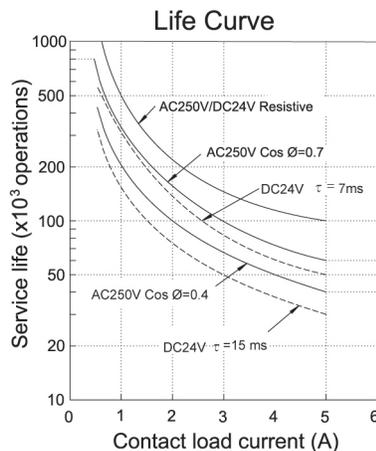
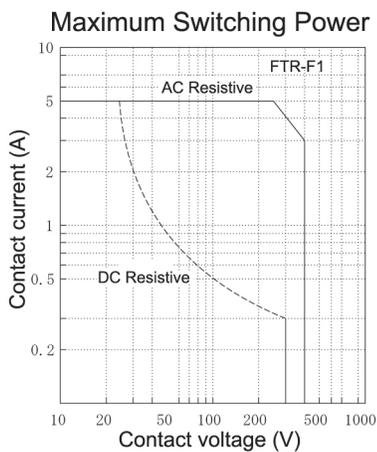
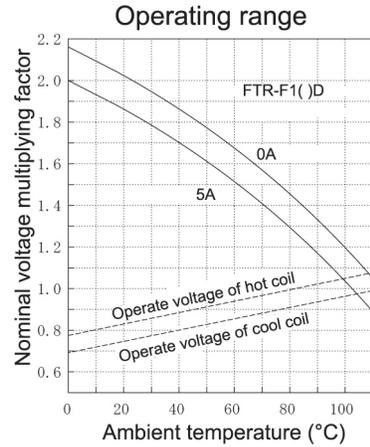
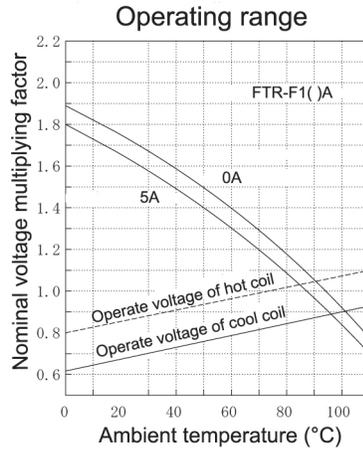
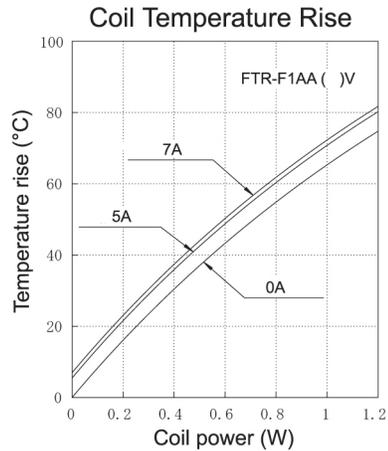
# FTR-F1 SERIES

## SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 508	Flammability: UL 94-V0 (plastics)
	E63614	5A, 24VDC (resistive) 5A, 250 VAC (resistive)
CSA	C22.2 No. 14	1/6 HP, 125VAC
	LR 40304	1/4 HP, 250VAC Pilot duty: C300 Pilot duty: R300 (F1AA( )T, F1AA( )V) TV-3 (F1AA( )T)
VDE	0435, 0631, 0700, 0860	5A, 250 VAC ( $\cos\phi=1$ ) 2A, 250 VAC ( $\cos\phi=0.4$ ) 5 A 24VDC (0ms), 85°C
	40013858	
SEMKO	EN 61058-1:1992 and A1 EN 61095:1993 and A1+A11	250VAC, 5 (1)A
IEC60335-1	GWFI IEC 60695-2-12	>850°C (except for -RG)
	GWIT IEC 60695-2-13	>775°C(except for -RG)

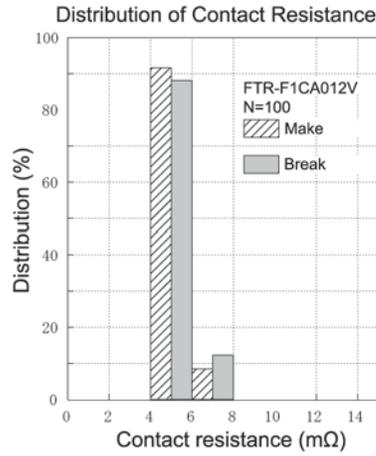
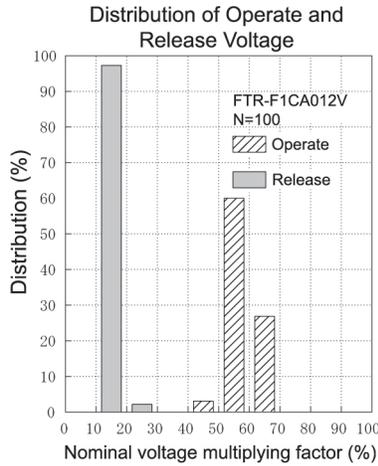
Complies with BSI, IMC, CQC

## CHARACTERISTIC DATA



# FTR-F1 SERIES

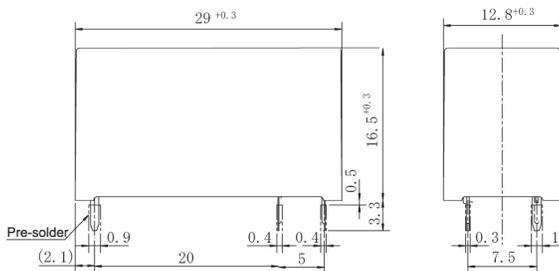
## ■ REFERENCE DATA



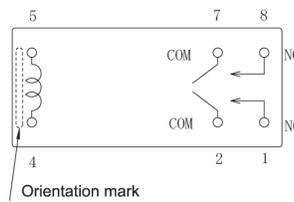
## ■ DIMENSIONS

### ● Dimensions

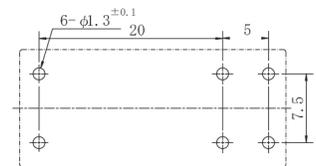
FTR-F1A type



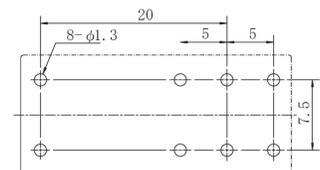
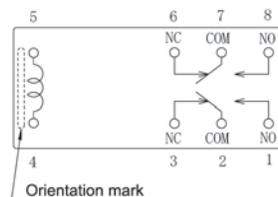
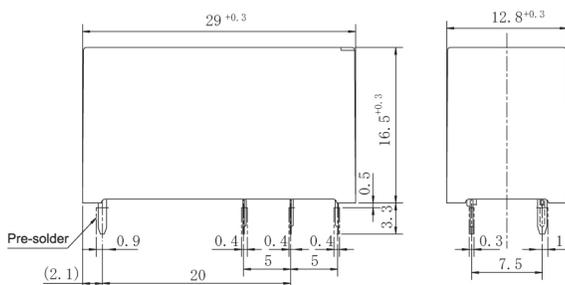
### ● Schematics (BOTTOM VIEW)



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



FTR-F1C type



Unit: mm

## RoHS Compliance and Lead Free Information

### 1. General Information

- All signal and power relays produced by Fujitsu Components are compliant with RoHS directive 2002/95/EC 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.

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