

# POWER RELAY

## 1 POLE - 10A High Sensitivity

### FTR-K1 Series

RoHS compliant

#### ■ FEATURES

- Low profile (height: 15.7mm)
- HIGH ISOLATION  
Insulation Distance (between coil and contacts): 10mm min.  
Dielectric strength: 5KV  
Surge strength: 10KV
- UL F Class wire
- Low coil power (400mW)
- Cadmium free contacts
- SAFETY STANDARDS  
UL, CSA, VDE, SEMKO approved  
UL, CSA TV-5 rating approved (1 form A type)
- RoHS Compliant
- UL F class isolation
- VDE Glow-wire ignitability test 775 (IEC60335-1) approved



#### ■ ORDERING INFORMATION

[Example]     FTR-K1   A   L   005   W   LA     (- BG)  
                  (a)    (b)   (c)   (d)   (e)   (f)            (g)

(a)	Series Name	FTR-K1 : FTR-K1 Series
(b)	Contact Arrangement	A : 1 form A (SPST-NO)
(c)	Coil Type / Enclosure	L : High sensitivity (200 mW) / flux free
(d)	Nominal Voltage	005 : 5 VDC,    006 : 6VDC,    009 : 9VDC    012 : 12VDC 018 : 18 VDC,   024 : 24VDC,   048 : 48VDC
(e)	Contact Material / TV type	W : AgSnO2
(f)	Terminal Pitch	LA : 10A high sensitive (250mW) 3.5mm pitch LB : 10A high sensitive (250mW) 5.0mm pitch
(f)	Special Designation	BG : Gold plated ; 3µm

Actual marking does not carry the type name : "FTR"  
E.g.: Ordering code: FTR-K1AL012WLA     Actual marking: K1AL012WLA

# FTR-K1 SERIES

## ■ PART NUMBERS

250mW type

Ordering Part Number	Series	Contact	Coil Power	Coil Voltage	Contact Material	Terminal Pitch	Special
FTR-K1AL005W-LA-(BG)	FTR-K1	A: 1 form A	L: 250 mW	5	W: Ag-SnO2	LA: 10A 3.5mm pitch	BG: Gold plated
FTR-K1AL006W-LA-(BG)				6			
FTR-K1AL009W-LA-(BG)				9			
FTR-K1AL012W-LA-(BG)				12			
FTR-K1AL018W-LA-(BG)				18			
FTR-K1AL024W-LA-(BG)				24			
FTR-K1AL048W-LA-(BG)				48			
FTR-K1AL005W-LB-(BG)				5		LB: 10A 5.0mm pitch	
FTR-K1AL006W-LB-(BG)				6			
FTR-K1AL009W-LB-(BG)				9			
FTR-K1AL012W-LB-(BG)				12			
FTR-K1AL018W-LB-(BG)				18			
FTR-K1AL024W-LB-(BG)				24			
FTR-K1AL048W-LB-(BG)				48			

## ■ COIL DATA CHART

Coil Voltage	Nominal Voltage (VDC)	Max. Coil Voltage*1	Coil Resistance (±10%)	Must Operate Voltage*2	Must Release Voltage*2	Nominal Power (mW)
005	5	15.0 VDC	100 Ω	3.75 VDC	0.5 VDC	250
006	6	18.0 VDC	145 Ω	4.5 VDC	0.6 VDC	
009	9	27.0 VDC	325 Ω	6.75 VDC	0.9 VDC	
012	12	36.0 VDC	575 Ω	9.0 VDC	1.2 VDC	
018	18	54.0 VDC	1,300 Ω	13.5 VDC	1.8 VDC	
024	24	72.0 VDC	2,310 Ω	18.0 VDC	2.4 VDC	
048	48	144.0 VDC	9,216 Ω	36.0 VDC	4.8 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

# FTR-K1 SERIES

## ■ SPECIFICATIONS

Item		FTR-K1 AL ( ) W- (LA, LB)	
Contact	Arrangement	1 form A	
	Material	AgSnO <sub>2</sub>	
	Resistance (initial)	Maximum 100 mΩ at 1 A, 6 VDC	
	Rating	10 A, 250 VAC	
	Maximum Carrying Current*1	10 A	
	Maximum Switching Rating	2,500VA	
	Maximum Switching Voltage	440 VAC	
	Minimum Switching Load*2	10 mA 5 VDC	
Coil	Nominal Power (at 20°C)	250mW	
	Operate Power (at 20°C)	141 mW	
	Operating Temperature	-40°C to +85°C (no frost), (LB: -40°C to +105°C)	
Time Value	Operate (without diode)	Maximum 15ms (at nominal voltage, no bounce)	
	Release (without diode)	Maximum 5ms (at nominal voltage, no bounce)	
Life	Mechanical	20 x 10 <sup>6</sup> operations minimum	
	Electrical	AC Contact rating	100 x 10 <sup>3</sup> operations min.
		DC contact rating	-
Other	Vibration Resistance	Misoperation	10 to 55 Hz, at double amplitude of 0.7 mm
		Endurance	10-55Hz, at double amplitude of 1.5 mm
	Shock Resistance	Misoperation	Min. 100m/s <sup>2</sup> (11±1ms)
		Endurance	Min. 1,000m/s <sup>2</sup> (6±1ms)
	Weight		Approximately 13g

\*1 Need to consider the heat from PCB when max. current is more than 10A.

\*2 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-K1 SERIES

## ■ INSULATION

Item	FTR-K1	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	5,000 VAC (50/60 Hz) 1 min.
Surge Voltage (coil and contact)	10,000 V	1.2 x 50µs standard wave
Clearance/Creepage	10 mm / 10 mm	
Insulation (DIN EN61810-1 VDE0435)		
Voltage	250 V	
Pollution	3	
Isolation material group	IIIa	
Isolation category / Reference voltage (VDE0110b)	C / 250 V	

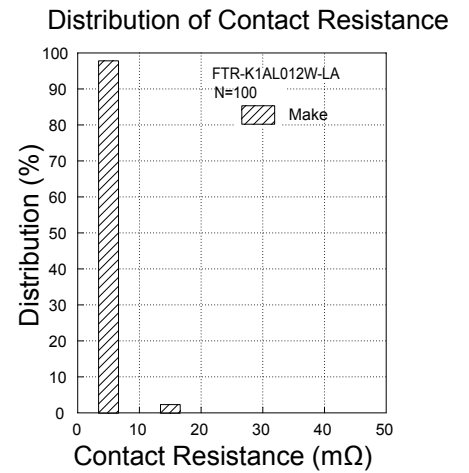
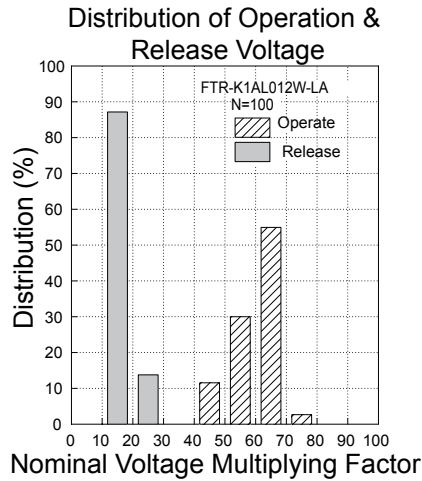
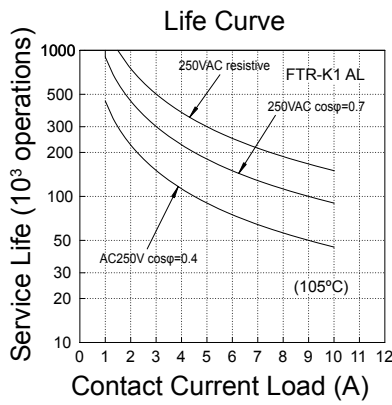
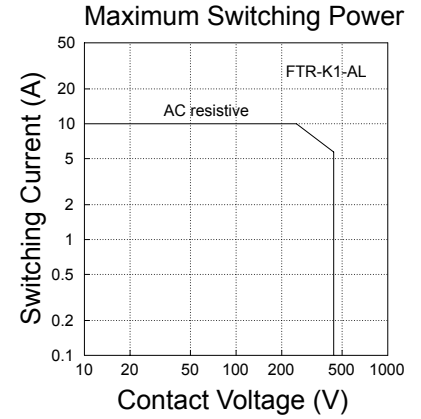
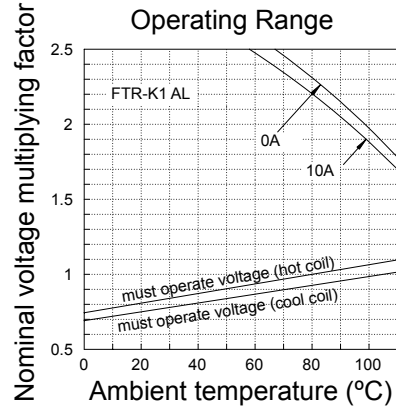
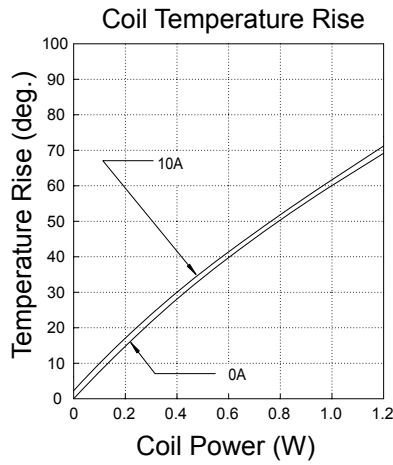
## ■ SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 508	Flammability: UL 94-V0 (plastics)
	E63614	FTR-K1AL ( )W-(LA, LB) 10A, 277 VAC (resistive)
CSA	C22.2 No. 14 LR 40304	1/3 HP, 125VAC 1/2 HP, 277VAC Pilot duty: B300 FTR-K1CL( )W-LA 10A, 277 VAC (resistive)
VDE	0435, 0631, 0700, 0860	FTR-K1AL ( )W-(LA, LB) 10A, 250 VAC, 150,000 cycles, LA: 85°C, LB:105°C 3A, 250 VAC (cosØ=0.4), 100,000 cycles, LA: 85°C, LB:105°C FTR-K1CL( )W-LA 10A, 250VAC, 100,000 cycles, 85°C
SEMKO	EN 61058-1:1992 and A1	250VAC, 10 (3)A 40T85 (-LA)
	EN 61095:1993 and A1+A11	250VAC, 10 (3)A 40T105(-LB)

Complies with NEMKO, DEMKO, FIMKO

# FTR-K1 SERIES

## CHARACTERISTIC DATA

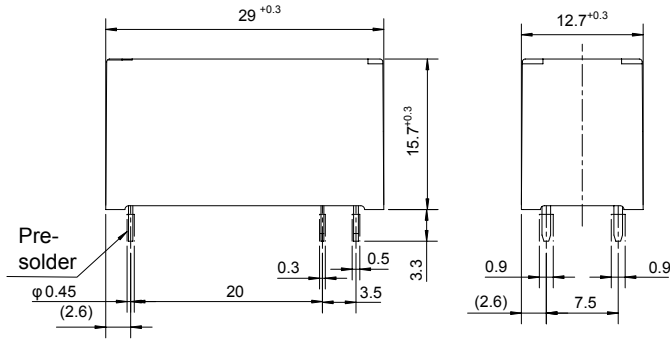


# FTR-K1 SERIES

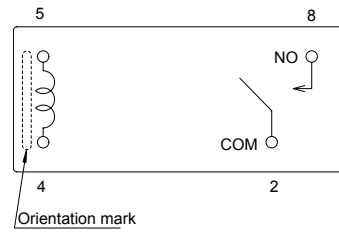
## ■ DIMENSIONS

### ● Dimensions

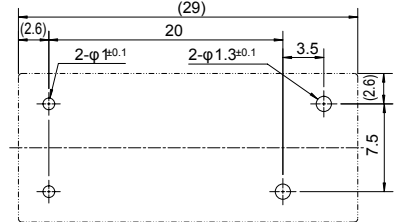
FTR-K1AL ( ) W-LA



### ● Schematics (BOTTOM VIEW)

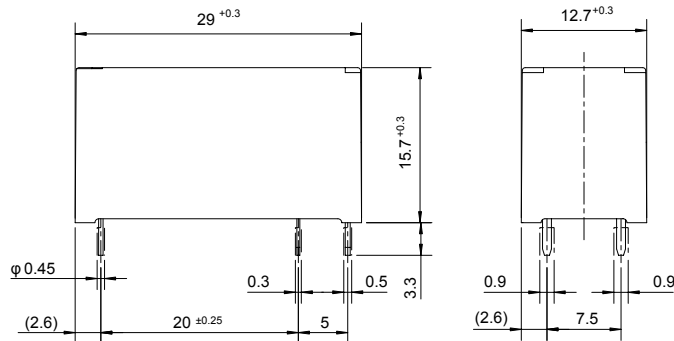


### ● PC board mounting hole layout (BOTTOM VIEW)

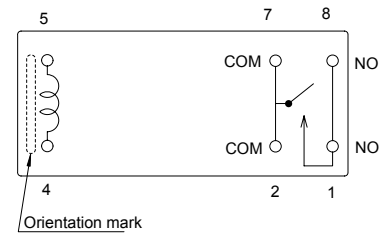


### ● Dimensions

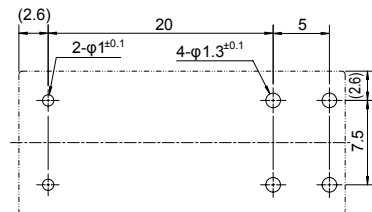
FTR-K1AL ( ) W-LB



### ● Schematics (BOTTOM VIEW)



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



Unit: mm

## 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, DecaBDE).
  - 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).
- 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.

#### 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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