

# POWER RELAY

## 1 POLE - 16A 80A Inrush type

### FTR-K1 Series

#### ■ FEATURES

- Peak 80A inrush current (1 form A type)
- Low profile (height: 15.7mm)
- High insulation  
Insulation distance (between coil and contacts):  
10mm min. Dielectric strength: 5KV Surge strength: 10KV
- Class F coil wire
- Low coil power (400mW)
- Glow wire compliant type available which satisfies GWT required for relay in IEC/EN 60335-1
- Cadmium free contacts
- Safety standards  
UL, CSA, VDE, CQC approved  
UL, CSA TV-5 rating approved (make contact)
- Flux proof, RTII
- RoHS compliant

Please see page 6 for more information



#### ■ Part Numbers

[Example]    FTR-K1    C    K    012    W    -    BG    -    GW  
                   (a)    (b)    (c)    (d)    (e)    (f)    (g)

(a)	Relay type	FTR-K1 : FTR-K1 series
(b)	Contact configuration	A : 1 form A (SPST-NO) C : 1 form C (SPDT)
(c)	Coil type	K : Standard type (400mW) / Flux proof
(d)	Coil rated voltage	012 : 5..... 110VDC Coil rating table at page 3
(e)	Contact material	T : AgSnO <sub>2</sub> (1 form A, TV-5 contact) W : AgSnO <sub>2</sub> (1form C, TV-5 contact) (make contact only)
(f)	Special type	Nil : Standard type (without gold plate) BG : Gold plated contact
(g)	Option	GW : Comply with GWEPT (IEC/EN 60695-2-11)

Actual marking does not carry the type name: "FTR" and option: "BG"  
 E.g.: Ordering code: FTR-K1CK012W Actual marking: K1CK012W

# FTR-K1 Series

## ■ Specifications

Item			FTR-K1 AK ( ) T	FTR-K1 CK ( ) W	Remarks / conditions	
Contact data	Configuration		1 form A	1 form C		
	Construction		Single			
	Material		AgSnO <sub>2</sub>			
	Resistance		Max. 100mΩ at 1A, 6VDC		Initial	
	Contact rating		16A, 250VAC / 24VDC		Resistive	
	Max. carrying current		20A			
	Max. inrush current		80A, 250VAC			
	Max. switching voltage		440VAC / 300VDC			
	Max. switching power		4,000VA / 384W			
	Min. switching load *1		100mA, 5VDC			
Coil	Rated power (20°C)		400mW (430mW at 48V coil, 420mW at 60V/110V coil)			
	Operate power (20°C)		196mW (211mW at 48V coil, 206mW at 60V/110V coil)			
	Operating temperature range		-40°C ~ +85°C		No frost	
Timing data	Operate		Max. 15ms		without bounce	
	Release		Max. 5ms		without bounce, no diode	
Life	Mechanical		Min. 20 x 10 <sup>6</sup> operations			
	Electrical	AC contact rating	Min. 100 x 10 <sup>3</sup> ops.	Min. 50 x 10 <sup>3</sup> ops.		
		DC contact rating	Min. 100 x 10 <sup>3</sup> ops.	Min. 30 x 10 <sup>3</sup> ops.		
		Peak inrush	Min. 10 x 10 <sup>3</sup> ops. (only make contact)		at 85°C, VDE#0435 (80A 250VAC)	
		Lamp (UL TV-5)	Min. 25 x 10 <sup>3</sup> ops.	Min. 25 x 10 <sup>3</sup> ops. (only make contact)		
Insulation	Insulation resistance		Min. 1000MΩ at 500VDC		Initial	
	Dielectric strength	Open contacts	1000VAC (50/60Hz), 1 minute			
		Coil contact	5000VAC (50/60Hz), 1 minute			
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave			
	Clearance		10mm			
	Creepage		10mm			
	EN61810-1, VDE0435	Voltage		250V		
		Pollution		3		
		Material group		III a		
Category		C / 250 (reference voltage) (VDE0110b)				
Other	Vibration resistance	Misoperation ≥1us	10 to 55 to 10Hz single amplitude 0.35mm			
		Endurance	10 to 55 to 10Hz single amplitude 0.75mm			
	Shock resistance	Misoperation ≥1us	Min. 100m/s <sup>2</sup> (11 ± 1ms)			
		Endurance	Min. 1,000m/s <sup>2</sup> (6 ± 1ms)			
	Dimensions / weight		12.7 x 29.0 x 15.7 mm / approx. 13g			
	Sealing		Flux proof, RTII			

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

\*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

# FTR-K1 Series

## ■ Coil Data

Coil code	Rated Coil Voltage (VDC)	Coil Resistance +/-10% ( $\Omega$ )	Must Operate Voltage* (VDC)	Must Release Voltage* (VDC)	Rated Power (mW)
005	5	62	3.5	0.5	400
006	6	90	4.2	0.6	
009	9	202	6.3	0.9	
012	12	360	8.4	1.2	
018	18	810	12.6	1.8	
022	22	1,210	15.4	2.2	
024	24	1,440	16.8	2.4	
028	28	1,960	19.6	2.8	
048	48	5,360	33.6	4.8	430
060	60	8,570	42.0	6.0	420
110	110	28,800	77.0	11.0	

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

\* : Specified operate 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.

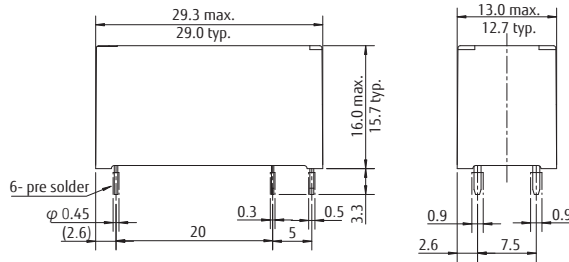
## ■ Safety Standards

Type	Compliance	Contact rating	
		1A	1C
UL	UL 508	Flammability: UL 94-V0 (plastics)	
	E63614	FTR-K1AK ( ) T(-GW) 16A, 24VDC (resistive) 16A, 277VAC (resistive) 20A, 277VAC (resistive) 1 hp 277VAC, 1/2hp 125VAC TV-5, 120VAC 25,000 cycles Pilot duty: A300	FTR-K1CK ( ) W(-GW) 16A, 277VAC/24VDC (resistive) 20A, 277VAC (resistive) 1 hp 277VAC, 1/2hp 125VAC 1/8 hp, 125VAC TV-5, 250VAC, 25,000 cycles (make contact) Pilot duty: B300
CSA	C22.2 No. 14		FTR-K1CK ( ) W(-GW) 16A, 277VAC/24VDC (resistive) 20A, 277VAC (resistive) 1hp 277VAC, 1/2hp 125VAC 1/8hp 125VAC TV-5, 120VAC (make contact) Pilot duty: B300
	LR 40304		
VDE	IEC/EN61810-1 EN60065 clause 14.6.1 (1a only) 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	FTR-K1AK ( ) T(-GW) 16A, 250VAC (cos $\phi$ =1), 85°C 3.5A, 250VAC (cos $\phi$ =0.4), 85°C 16A, 24VDC (0ms), 85°C 5A/80A, 250VAC 10,000 times, 85°C	FTR-K1CK ( ) W(-GW) 16A, 250VAC (cos $\phi$ =1), 85°C 3.5A, 250VAC (cos $\phi$ =0.4), 85°C 16A, 24VDC (0ms), 85°C
CQC	GB/T21711.1 GB15092.1 12002083788	FTR-K1AK ( ) T 12A, 240VAC 72LRA/12FLA 240VAC	FTR-K1CK ( ) W 16A, 250VAC

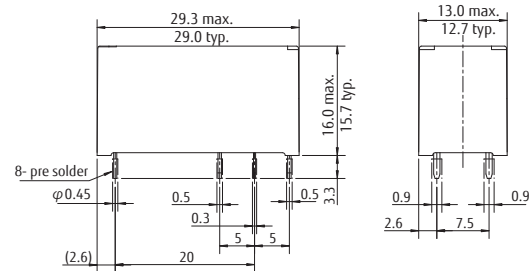
# FTR-K1 Series

## ■ Dimensions

- Dimensions (FTR-K1AK( )T)

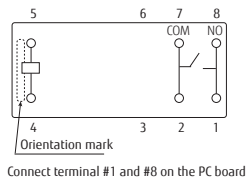


- Dimensions (FTR-K1CK( )W)

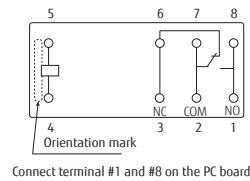


\*Dimensions of the terminals do not include thickness of pre-solder.

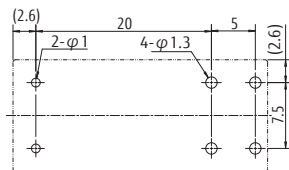
- Schematics (BOTTOM VIEW) (FTR-K1AK( )T)



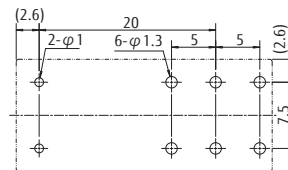
- Schematics (BOTTOM VIEW) (FTR-K1CK( )W)



- PC Board Mounting Hole Layout (BOTTOM VIEW) (FTR-K1AK( )T)



- PC Board Mounting Hole Layout (BOTTOM VIEW) (FTR-K1CK( )W)



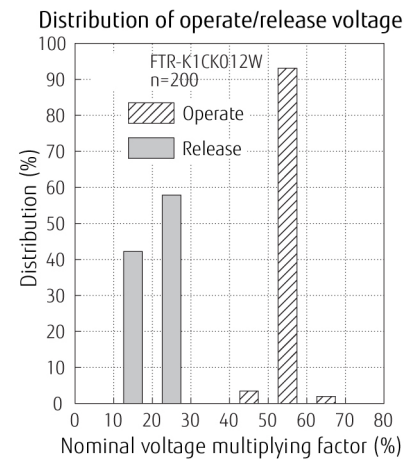
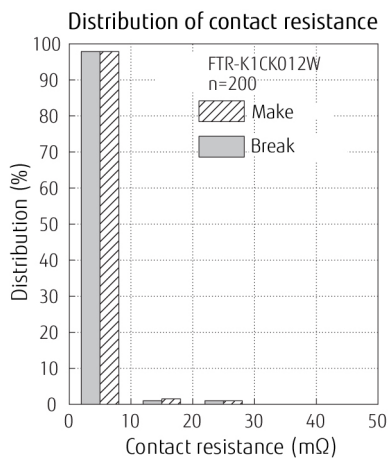
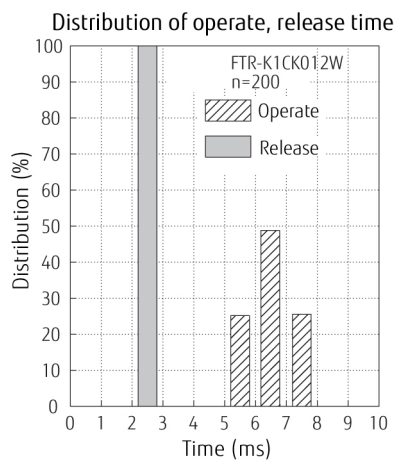
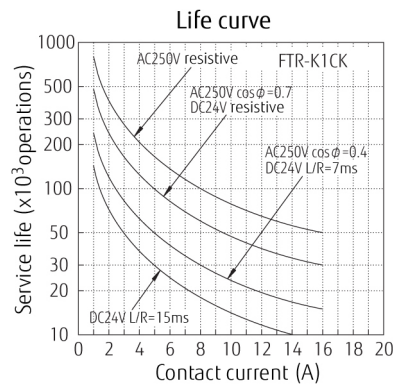
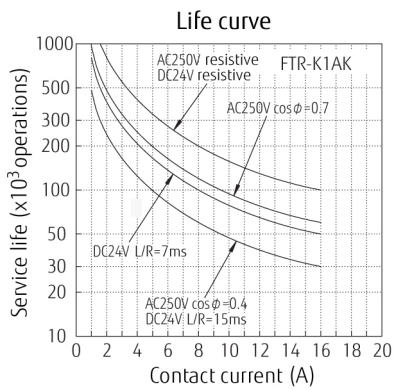
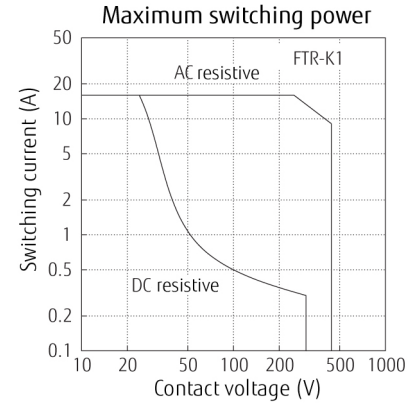
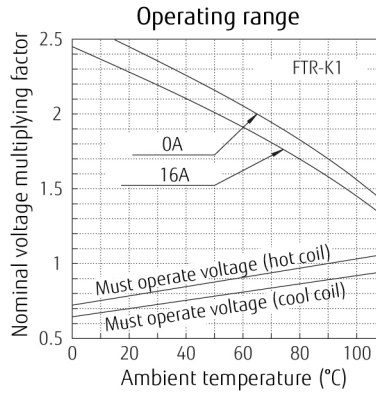
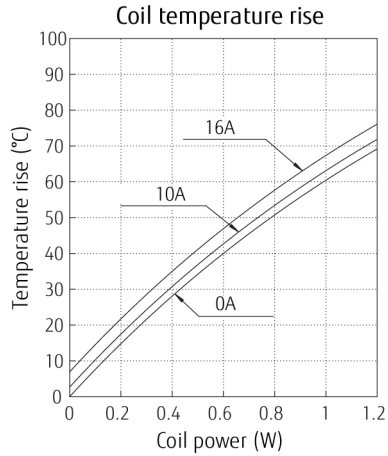
Tolerance of PC board mounting hole layout :  $\pm 0.1$  unless otherwise specified.

( ): Reference value  
Unit: mm

# FTR-K1 Series

## ■ Characteristic Data (Reference)

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



# FTR-K1 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: 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 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-K1 Series

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