

# POWER RELAY

## 1 POLE - 20A Heavy Load

### FTR-K3 Series

#### ■ FEATURES

- SPST 20A and #250 tab terminal type is also available
- Low coil power (780mW)
- 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
- Flux proof
- RoHS compliant
  - Please see page 6 for more information



#### ■ PARTNUMBER INFORMATION

[Example]       $\frac{\text{FTR-K3}}{\text{(a)}} \quad \frac{\text{A}}{\text{(b)}} \quad \frac{\text{B}}{\text{(c)}} \quad \frac{\text{012}}{\text{(d)}} \quad \frac{\text{W}}{\text{(e)}} - \frac{\text{HC}}{\text{(f)}} - \frac{\text{GW}}{\text{(g)}}$

(a)	Relay type	FTR-K3 : FTR-K3-Series
(b)	Contact configuration	A : 1 form A (SPST-NO) (PCB terminal) J : 1 form A (SPST-NO) (Tab terminal)
(c)	Coil type	B : Standard type (780mW)
(d)	Coil rated voltage	012 : 5.....48 VDC Coil rating table at page 3
(e)	Contact material	W : Silver alloy
(f)	Special type	Nil : Standard type (20A) LS : High isolation type (20A) HC : High current type (25A)
(f)	Option	GW : Comply with GWEPT (IEC/EN 60695-2-11) Not applicable for (b) J, (f) LS, HC

Actual marking does not carry the type name : "FTR" and Option : "GW"  
E.g.: Ordering code: FTR-K3AB012W    Actual marking: K3AB012W

# FTR-K3 SERIES

## ■ SPECIFICATION

Item			FTR-K3	FTR-K3-LS	FTR-K3-HC
Contact Data	Configuration		1 form A		
	Construction		Single		
	Material		Silver alloy		
	Resistance (initial)		Max. 100mΩ at 1A, 6VDC		
	Contact rating (resistive)		20A, 250VAC	20A, 250VAC	25A, 250VAC
	Max. carrying current		25A		
	Max. inrush current		20A (peak) / steady 20A 100VAC (inverter load)		
	Max. switching current *1		25A		
	Max. switching voltage		250VAC		
	Max. switching power		6,250VA		
	Min. switching load *2		100 mA, 5VDC		
Life	Mechanical		Min. 2 x 10 <sup>6</sup> operations		
	Electrical	Resistive load	Min. 100 x 10 <sup>3</sup> operations		
		Motor load	Min. 200 x 10 <sup>3</sup> operations (250VAC inrush 80A cosφ=0.7 cut off 20A cosφ=0.9)	Min. 200 x 10 <sup>3</sup> operations (250VAC inrush 80A cosφ=0.7 cut off 20A cosφ=0.9)	Min. 200 x 10 <sup>3</sup> operations (250VAC inrush 80A cosφ=0.7 cut off 25A cosφ=0.9)
		Inverter load	Min. 30 x 10 <sup>3</sup> operations 100VAC, inrush 200A / cut off 20A		
Coil Data	Rated power (at 20 °C)		780 mW		
	Operate power (at 20 °C)		380 mW		
	Operating temperature range		-40 °C to +60 °C (no frost)		
Timing Data	Operate (at nominal voltage)		Max. 20ms (without bounce)		
	Release (at nominal voltage)		Max. 10ms (no diode, without bounce)		
Insulation	Resistance		Min. 1,000MΩ at 500VDC		
	Dielectric strength	Open contacts	1,000VAC (50/60Hz) 1min		
		Contacts to coil	5,000VAC (50/60Hz) 1min		
	Surge strength	Coil to contacts	8,500V / 1.2 x 50μs standard wave		
	Clearance/creepage distance		6.4mm / 9.5mm	8.0mm / 9.5mm	6.4mm / 9.5mm
Other	Vibration resistance	Misoperation	10 to 55 to 10Hz single amplitude 0.75 mm		
		Endurance	10 to 55 to 10Hz single amplitude 0.75 mm		
	Shock	Misoperation	Min. 200m/s <sup>2</sup> (11 ± 1ms)		
		Endurance	Min. 1,000m/s <sup>2</sup> (6 ± 1ms)		
	Weight		Approximately 25 g		
	Sealing		Flux proof, RTII		

\* 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 actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

## ■ COIL RATING

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release-Voltage (VDC) *	Rated Power (mW)
005	5	32	3.5	0.5	780
006	6	46	4.2	0.6	
009	9	105	6.3	0.9	
012	12	185	8.4	1.2	
018	18	415	12.6	1.8	
024	24	740	16.8	2.4	
048	48	2,955	33.6	4.8	

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

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

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		
		FTR-K3	FTR-K3-LS	FTR-K3-HC
UL	UL508 No. E63614	20A, 277VAC (resistive at 60 °C) 1hp, 125VAC (at 60 °C) 2hp, 277VAC (100,000 ops. at 60 °C)		25A, 277VAC (resistive at 60 °C) 1hp, 125VAC (at 60 °C) 2hp, 277VAC (100,000 ops. at 60 °C)
CSA	C22.2 No. 14 No. LR40304	20A, 277VAC (resistive) 1hp, 125VAC 2hp, 277VAC (100,000 ops.)	-	25A, 277VAC (resistive) 1hp, 125VAC 2hp, 277VAC (100,000 ops.)
VDE	IEC61810-1 EN60950-1 clause 2.9.2; 2.10.3; 2.10.5; 5.2 (only -LS)	20A, 250VAC (cos φ=1) 60 °C		25A, 250VAC (cos φ=1) 60 °C
CQC	GB15092-1 GB8898 GB/T21711.1 No. 17002165723	20A, 250VAC	-	25A, 250VAC
TUV	IEC61810-1	-	20A, 250VAC (cos φ=1) 60 °C	-

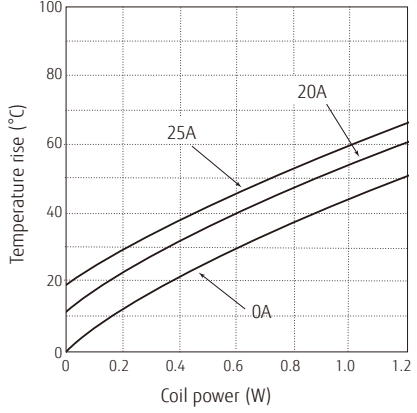
# FTR-K3 SERIES

## CHARACTERISTIC DATA

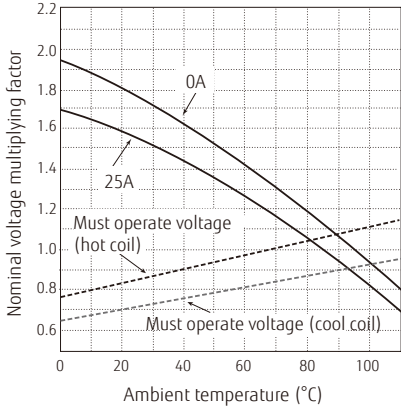
(Characteristic data is not guaranteed value but measured values of samples from production line.)

### FTR-K3 / FTR-K3-LS / FTR-K3-HC

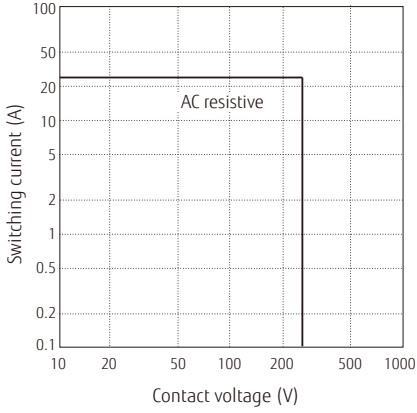
Coil temperature rise



Operating range

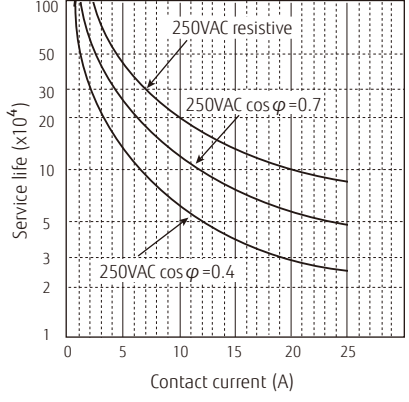


Maximum switching power

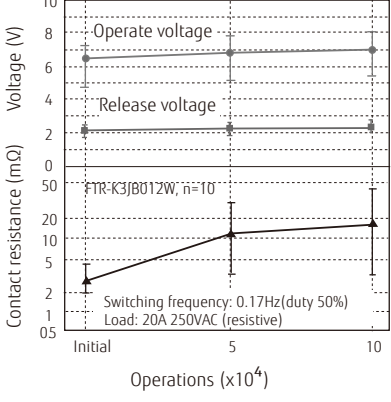


### FTR-K3 / FTR-K3-LS

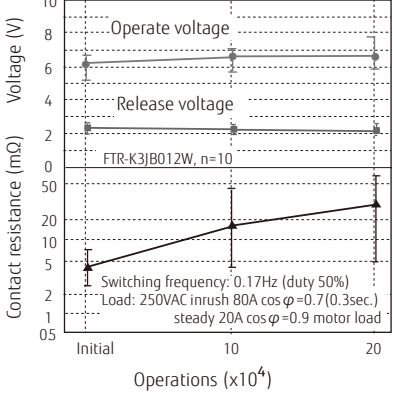
Life curve



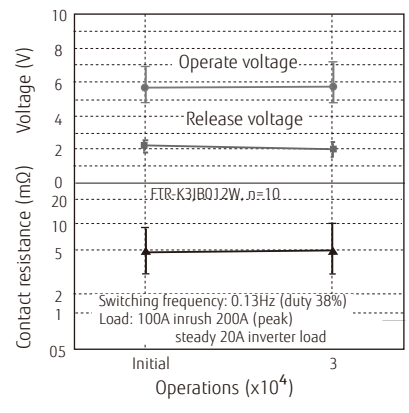
Electrical life test (resistive)



Electrical life test (motor load)

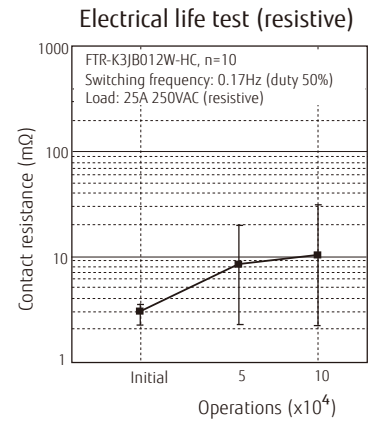
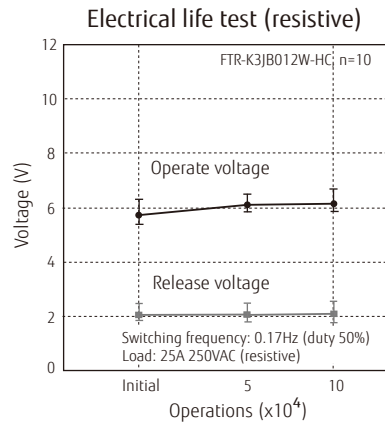
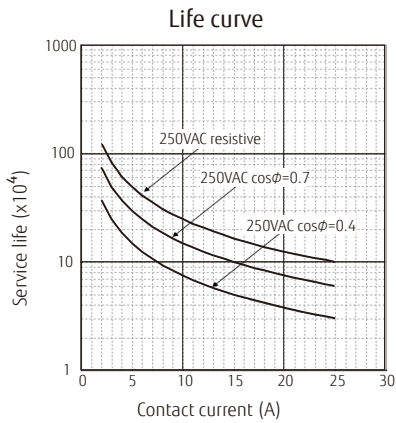


Electrical life test (inverter load)



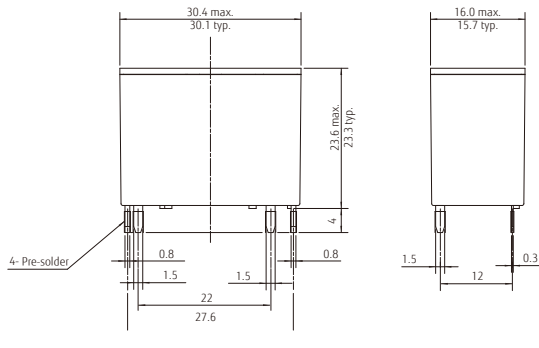
# FTR-K3 SERIES

## ■ FTR-K3-HC

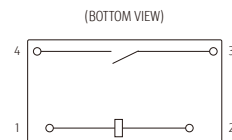


## ■ DIMENSIONS

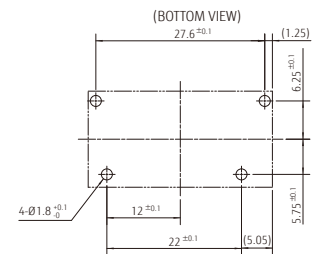
### ● Dimensions (FTR-K3AB type)



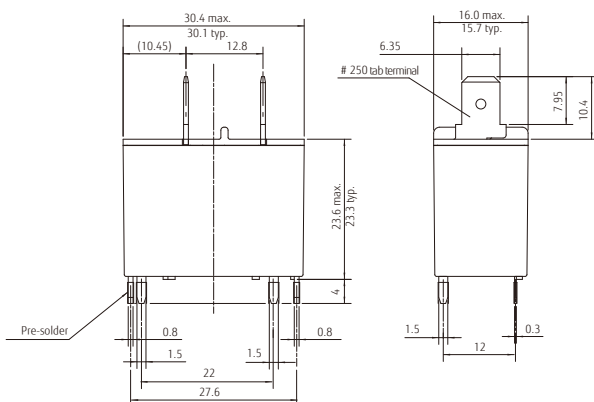
### ● Schematics



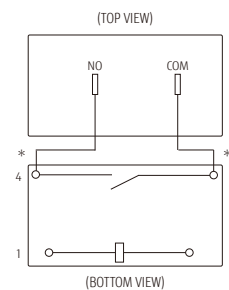
### ● PC board mounting hole layout



### ● Dimensions (FTR-K3JB type)

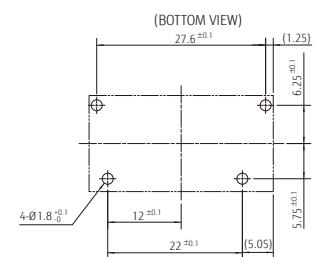


### ● Schematics



\* : Contact terminal and tab terminal are connected inside the relay

### ● PC board mounting hole layout



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

Unit: mm  
( ) : Reference

## 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.

## RoHS Compliance and Lead Free Information

### 1. General Information

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