

POWER RELAY

1 POLE - 16A, 105°C, FLUX FREE TYPE

FTR-K1 Series

RoHS Compliant



■ FEATURES

- Low profile (height: 15.7mm)
- High insulation
Insulation distance (between coil and contacts): 10mm min.
Dielectric strength: 5kV
Surge strength: 10kV
- 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 approved
UL, TV-5 rating approved (1 form A type)
- UL F class insulation wire
- Flux proof, RTII
- RoHS compliant



■ APPLICATIONS

Heater control, microwave toaster oven combo, cooking table etc.

■ PART NUMBERS

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

(a)	Relay type	FTR-K1 series
(b)	Contact configuration	A : 1a (1 Form A, SPST-NO) C : 1c (1 Form C, SPDT)
(c)	Coil type	K : Standard type (400mW)
(d)	Coil rated voltage	012 : 5...110VDC Please refer to coil rating table
(e)	Contact material / TV type	T : AgSnO ₂ (1a, TV-5) W : AgSnO ₂ (1c)
(f)	Special type	HT : 105°C, flux free type
(g)	Option	GW Comply with GWEPT (IEC/EN 60695-2-11)

Actual marking does not carry the type name : "FTR"

E.g.: Ordering code: FTR-K1CK012W-HT Actual marking: K1CK012W

HT marking not part of type number printing but next to coil rating print.

■ SPECIFICATIONS

Item		Specifications		Remarks/Conditions	
		FTR-K1AK()T-HT	FTR-K1CK()W-HT		
Contact Data	Configuration	1a (1 Form A)	1c (1 Form C)		
	Construction	Single			
	Material	AgSnO ₂			
	Resistance	Max. 100mΩ		Initial at 1A, 6VDC	
	Contact rating	16A, 250VAC/24VDC		Resistive	
	Max. carrying current* ¹	20A			
	Max. inrush current	78A 250VAC (only make contact)			
	Max. switching voltage	440VAC/300VDC			
	Max. switching power	4,000VA/384W			
	Min. switching load * ²	100mA, 5VDC			
Coil	Rated power (20°C)	400 to 430mW			
	Operate power (20°C)	200 to 210mW			
	Operating temperature range	-40°C to +105°C		No frost	
Time	Operate	Max. 15ms		Without bounce, no diode	
	Release	Max. 5ms		Without bounce, no diode	
Life	Mechanical	Min. 20 x 10 ⁶ operations			
	Electrical	AC contact rating	Min. 100 x 10 ³ ops.	Min. 50 x 10 ³ ops.	
		DC contact rating	Min. 100 x 10 ³ ops.	Min. 30 x 10 ³ ops.	
		Lamp (UL TV-5)	Min. 25 x 10 ³ ops.	-	
Insulation	Insulation resistance	Min. 1,000MΩ		At 500VDC	
	Dielectric withstanding strength	Open contacts	1,000VAC (50/60Hz), 1 minute		
		Coil to contacts	5,000VAC (50/60Hz), 1 minute		
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave		
	Clearance / creepage	10mm / 10mm			
	EN61810-1, VDE0435	Voltage	250V		
		Pollution degree	3		
		Material group	IIIa		
Category		C / 250 (reference voltage) (VDE0110b)			
Others	Vibration resistance	Misoperation≥1μs	10 to 55 to 10Hz single amplitude 0.35mm	Coil ON/OFF, 3 axis, total 6 cycles	
		Endurance	10 to 55 to 10Hz single amplitude 0.75mm	Coil OFF, 3 axis, total 6 hours	
	Shock resistance	Misoperation≥1μs	Min. 100m/s ² (11±1ms)	Coil ON/OFF, 3 axis, total 36 operations	
		Endurance	Min. 1,000m/s ² (6±1ms)	Coil OFF, 3 axis, total 18 operations	
	Dimensions / Weight	12.7 x 29.0 x 15.7 mm / approx. 13g			
	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 DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance $\pm 10\%$ (Ω)	Must Operate Voltage* ¹ (VDC)	Must Release Voltage* ¹ (VDC)	Nominal 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	
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 for 20°C and zero contact current unless otherwise specified.

*: Specified operated values are valid for pulse 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.

■ PART NUMBER LIST

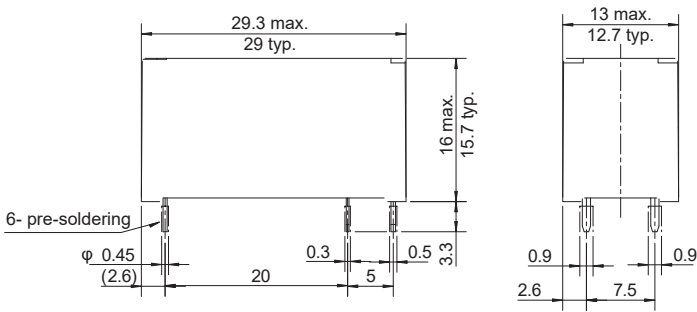
Part Number	Contact Configuration	Nominal Power	Contact Material	Others
FTR-K1AK()T-HT	1a (1 Form A)	Standard (Approx. 400 to 430mW)	AgSnO ₂	TV-5 rating
FTR-K1AK()T-HT-GW				TV-5 rating, comply with GWEPT
FTR-K1CK()W-HT	1c (1 Form C)	Standard (Approx. 400 to 430mW)	AgSnO ₂	-
FTR-K1CK()W-HT-GW				Comply with GWEPT

■ SAFETY STANDARDS

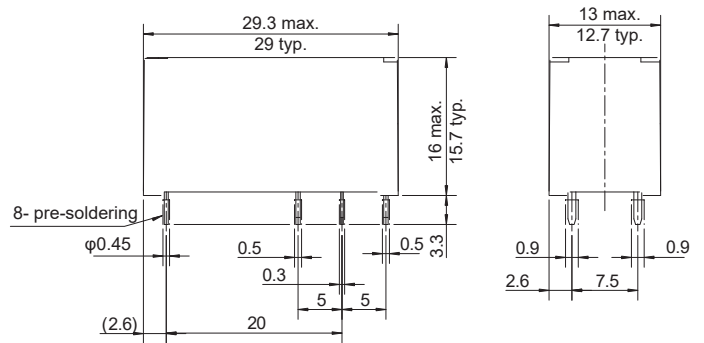
Type	Compliance	Contact Rating	
		1a	1c
UL	Flammability: UL 94-V-0 (plastics)		
	UL508 File No. E63614	16A, 24VDC (resistive) 105°C 16A, 277VAC (resistive) 105°C 20A, 277VAC (resistive) 105°C 1hp, 277VAC 105°C 1/2 hp, 125VAC 105°C TV-5, 120VAC, 25,000 cycles, 105°C Pilot duty: A300 105°C	16A, 24VDC (resistive) 105°C 16A, 277VAC (resistive) 105°C 20A, 277VAC (resistive) 105°C 1 hp, 277VAC 105°C 1/2 hp, 125VAC 105°C 1/8 hp, 125VAC 105°C Pilot duty: B300 105°C
VDE	IEC/EN61810-1, EN60730-1 clause 12.2; 13.2; 20.1; 20.2; 20.3, EN60335-1 clause 15.3; 16.3; 29.1; 29.2; 29.3	16A, 250VAC (cosφ=1), 105°C 10A, 250VAC (cosφ=1), 105°C	

■ DIMENSIONS

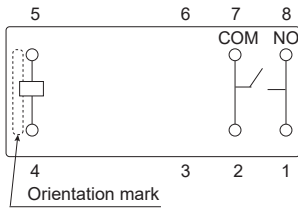
Dimensions (FTR-K1AK()T-HT)



Dimensions (FTR-K1CK()W-HT)

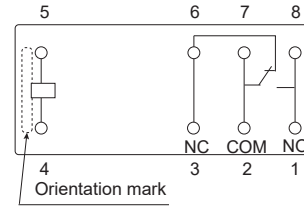


Schematics
(BOTTOM VIEW) (FTR-K1AK()T-HT)



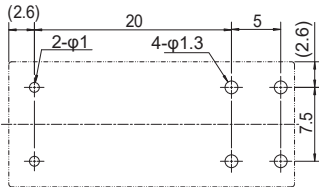
Connect terminal #1 and #8 on the PC board

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

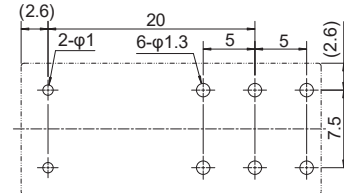


Connect terminal #1 and #8 on the PC board

PC board mounting hole layout
(BOTTOM VIEW) (FTR-K1AK()T-HT)



PC board mounting hole layout
(BOTTOM VIEW) (FTR-K1CK()W-HT)

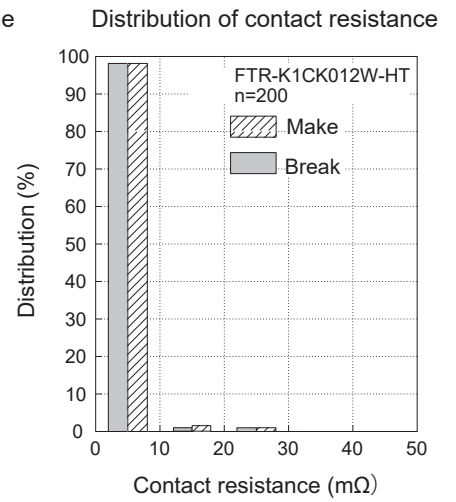
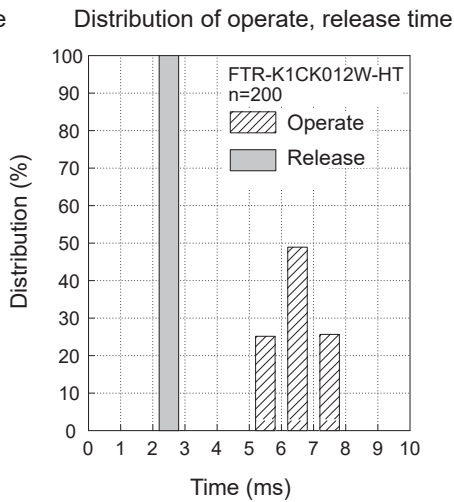
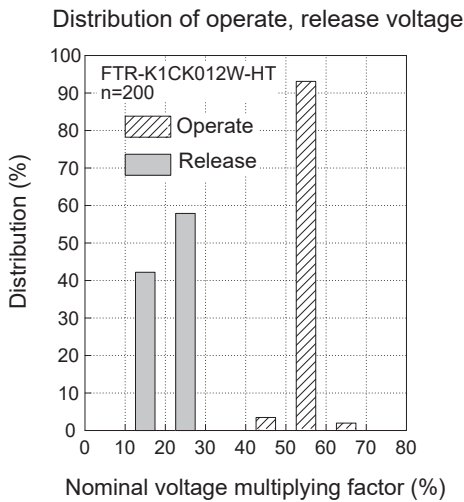
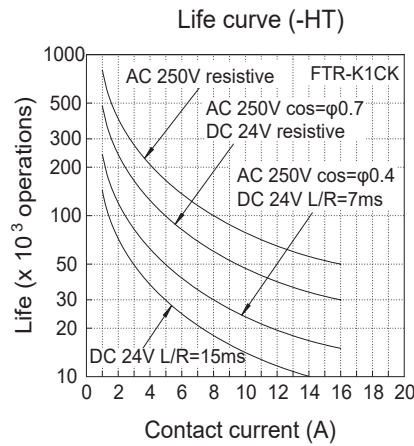
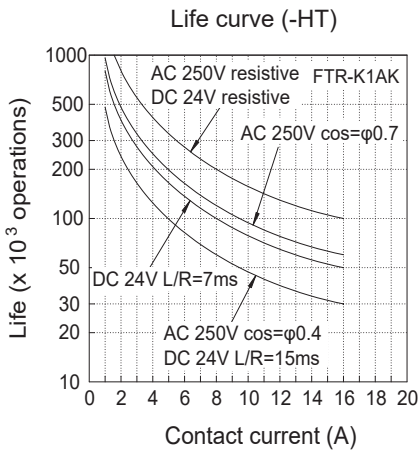
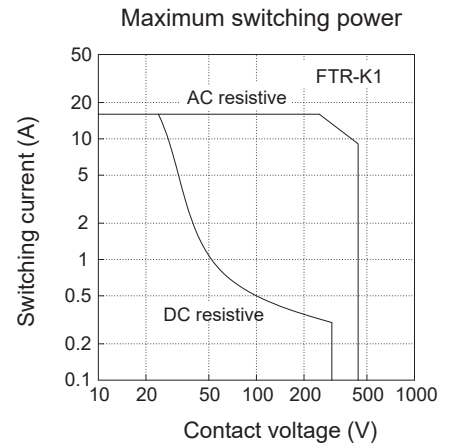
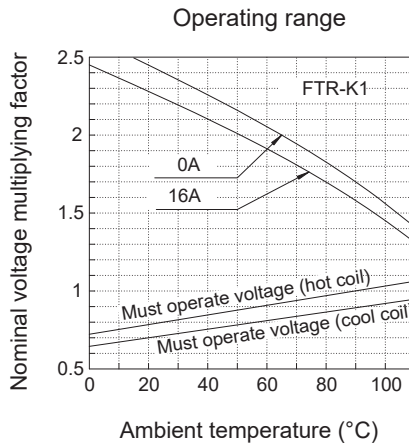
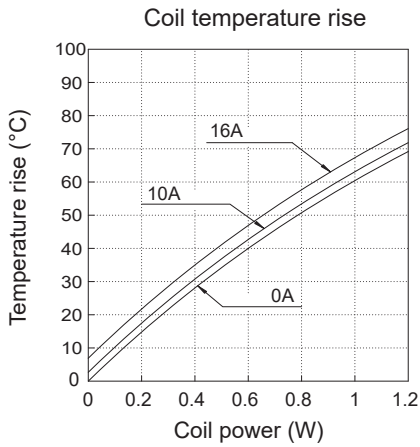


- * Dimensions of the terminals do not include thickness of pre-soldering.
- * Tolerance of PC board mounting hole layout : ± 0.1 unless otherwise specified.
- * Dimensions do not include tolerances. Please ask specification in case you need tolerances.

(Unit: mm)

CHARACTERISTIC DATA

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



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 FCL 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.

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