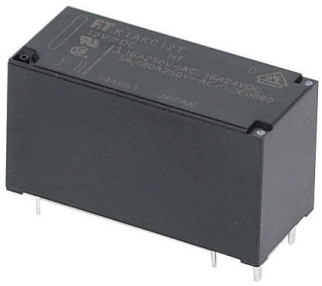
POWER RELAY
1 POLE - 16A, 105°C, FLUX FREE TYPE

FTR-K1 Series

RoHS Compliant

■ FEATURES



- Low profile (height: 15.7mm)
- High insulation
  Insulation distance (between coil and contacts): 10mm min.
  Dielectric strength: 5,000V
  Surge strength: 10,000V
- 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*1 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.

*1: 110V coil is not for new design.

■ 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		-40ºC to +105ºC		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 contacs	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 ±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	430
060	60	8,570	42.0	6.0	420
110*2	110*2	28,800	77.0	11.0	

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

*1: Specified operated values are valid for pulse voltage.

*2: 110V coil is not for new design.

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

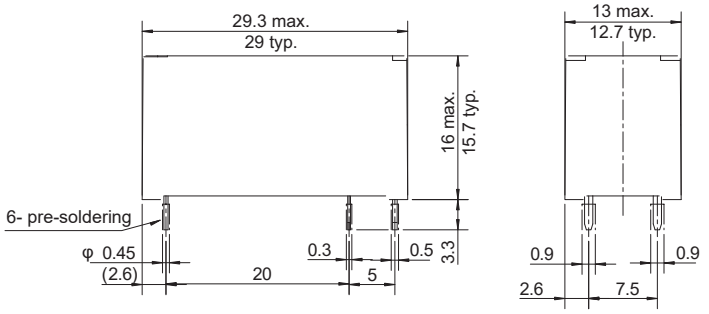
Type	Compliance	Contact Rating	
		1a	1c
UL	Flammability: UL 94-V-0 (plastics)		
	UL508 File No. E63614	16A, 24VDC (resistive) 105ºC 16A, 277VAC (resistive) 105ºC 20A, 277VAC (resistive) 105ºC 1hp, 277VAC 105ºC 1/2 hp, 125VAC 105ºC TV-5, 120VAC, 25,000 cycles,105ºC Pilot duty: A300 105ºC	16A, 24VDC (resistive) 105ºC 16A, 277VAC (resistive) 105ºC 20A, 277VAC (resistive) 105ºC 1 hp, 277VAC 105ºC 1/2 hp, 125VAC 105ºC 1/8 hp, 125VAC 105ºC Pilot duty: B300 105ºC
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), 105ºC 10A, 250VAC (cosφ=1), 105ºC	

■ PART NUMBER LIST

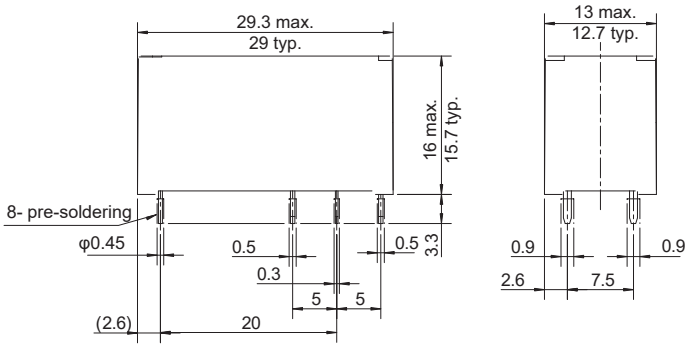
Part Number	Contact Configuration	Nominal Power	Contact Material	Others
FTR-K1AK( )T-HT	1a (1 Form A)	Standard (Approx. 400 to 430mW)	$AgSnO_2$	TV-5 rating
FTR-K1AK( )T-HT-GW				TV-5 rating, comply with GWEPT
FTR-K1CK( )W-HT	1c (1 Form C)	Standard (Approx. 400 to 430mW)	$AgSnO_2$	-
FTR-K1CK( )W-HT-GW				Comply with GWEPT

■ DIMENSIONS

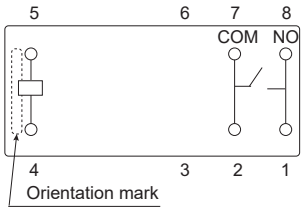
DImensions (FTR-K1AK( )T-HT)



DImensions (FTR-K1CK( )W-HT)

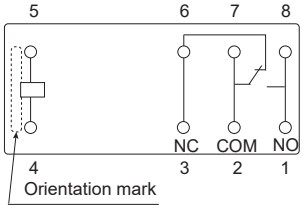


Schematics
(BOTTOM VIEW) (FTR-K1AK( )T-HT)



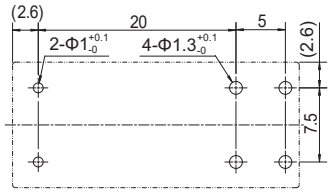
Connect terminal #1 and #8 on the PC board

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

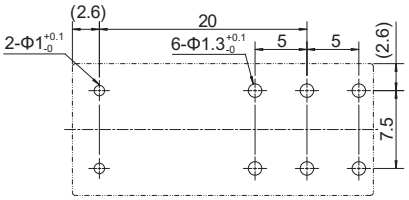


Connect terminal #1 and #8 on the PC board

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



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



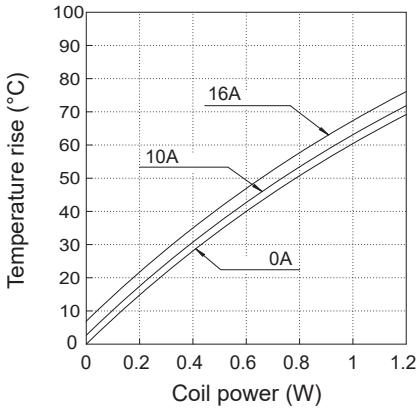
* Dimensions of the terminals do not include thickness of pre-soldering.
* Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.
* Dimensions do not include tolerances. Please ask specification in case you need tolerances.

(Unit: mm)

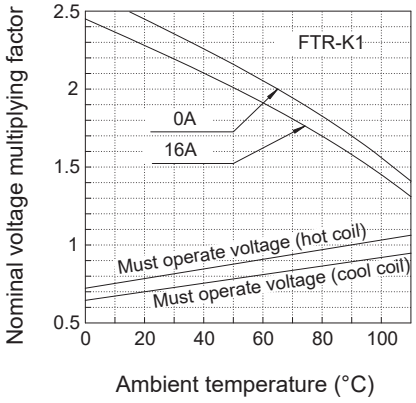
■ CHARACTERISTIC DATA

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

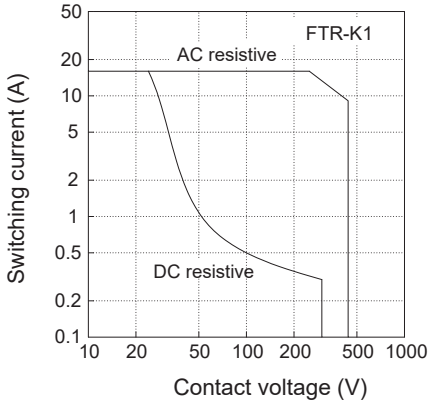
Coil temperature rise



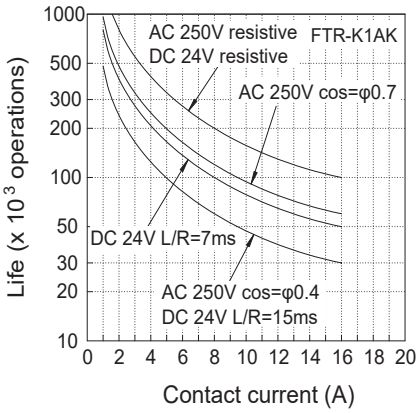
Operating range



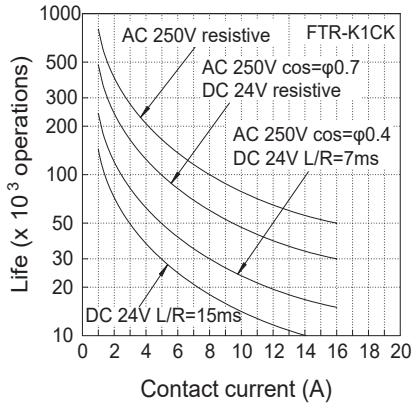
Maximum switching power



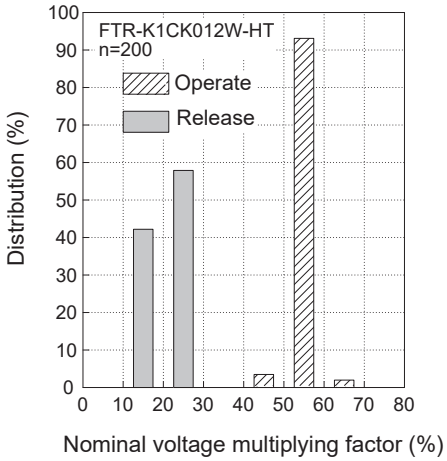
Life curve (-HT)



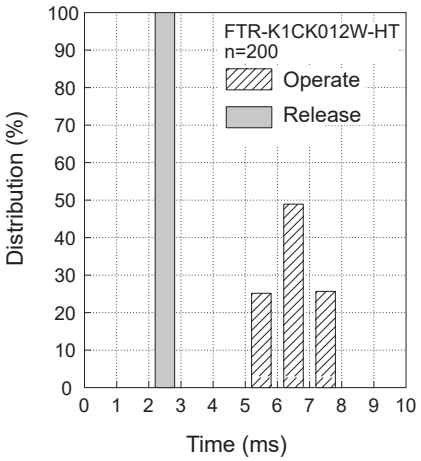
Life curve (-HT)



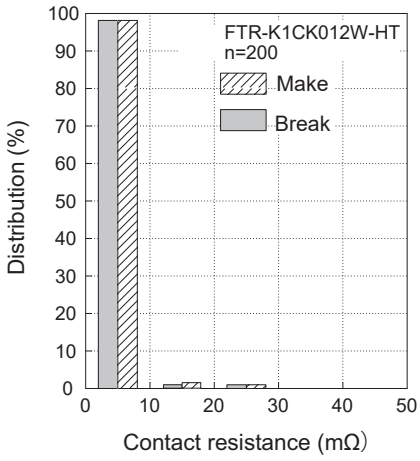
Distribution of operate, release voltage



Distribution of operate, release time



Distribution of contact resistance



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.