

POWER RELAY

1 POLE - 16A, 80A INRUSH TYPE

FTR-K1 Series

RoHS Compliant

■ FEATURES

- Peak 80A inrush current (1 form A type)
- Low profile (height: 15.7mm)
- High insulation
- Insulation distance (between coil and contacts): 10mm minimum, dielectric strength: 5,000V, surge strength: 10,000V
- 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



■ APPLICATIONS

Heater control, home appliances, lighting equipment etc.

■ PART NUMBERS

[Example] FTR-K1 A K 012 I - BG - 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 contact) W : AgSnO ₂ (1c, 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

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

■ SPECIFICATIONS

Item			Specifications		Remarks/Conditions
			FTR-K1AK()T	FTR-K1CK()W	
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		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)		400 to 430mW		
	Operate power (20°C)		196 to 211mW		
	Operating temperature range		-40°C to +85°C		No frost
Time	Operate		Max. 15ms		Without bounce
	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.	
		Peak inrush	Min. 10 x 10 ³ ops. (only make contact)		At 85°C, VDE#0435 (80A 250VAC)
		Lamp (UL TV-5)	Min. 25 x 10 ³ ops.	Min. 25 x 10 ³ ops. (only make contact)	
Insulation	Insulation resistance		Min. 1000MΩ		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		

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 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)	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 ^{*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.

■ PART NUMBER LIST

Part Number	Contact Configuration	Rated Power	Contact Material	UL TV Rating	Others
FTR-K1AK()T	1a (1 Form A)	Standard (Approx. 400 to 430mW)	AgSnO ₂	TV-5	-
FTR-K1AK()T-GW			AgSnO ₂ +Au plate		Comply with GWEPT
FTR-K1AK()T-BG					-
FTR-K1AK()T-BG-GW			Comply with GWEPT		
FTR-K1CK()W	1c (1 Form C)	Standard (Approx. 400 to 430mW)	AgSnO ₂	TV-5 (N.O.)	-
FTR-K1CK()W-GW			AgSnO ₂ +Au plate		Comply with GWEPT
FTR-K1CK()W-BG					-
FTR-K1CK()W-BG-GW			Comply with GWEPT		

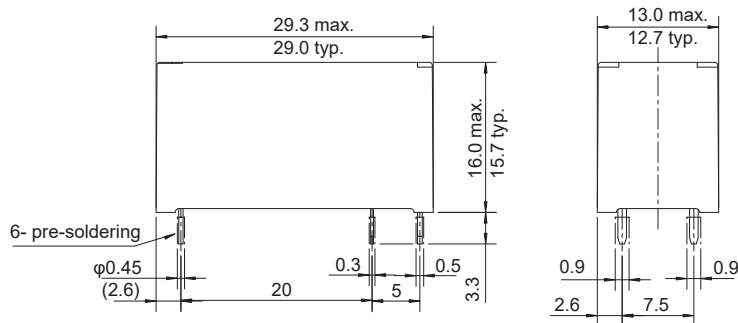
■ SAFETY STANDARDS

Type	Compliance	Contact Rating	
		1a	1c
UL	Flammability: UL 94-V-0 (plastics)		
	UL508 File No. 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 File No. LR40304		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
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 File No. 12002083788	FTR-K1AK () T 12A, 240VAC 72LRA/12FLA 240VAC	FTR-K1CK () W 16A, 250VAC

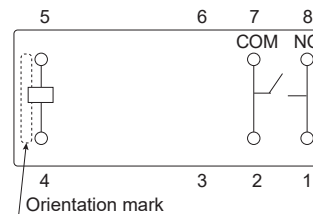
■ DIMENSIONS

FTR-K1AK()T

Dimensions

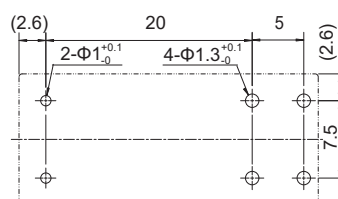


Schematics (BOTTOM VIEW)



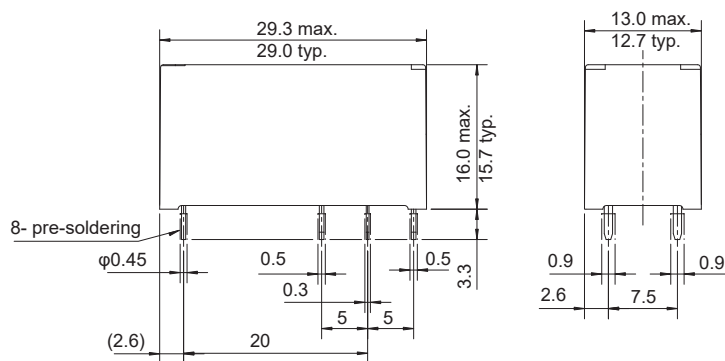
Connect terminal #1 and #8 on the PC board

PC board mounting hole layout (BOTTOM VIEW)

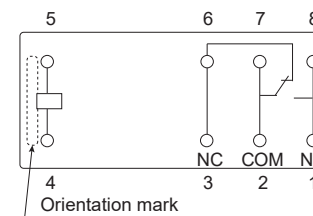


FTR-K1CK()W

Dimensions

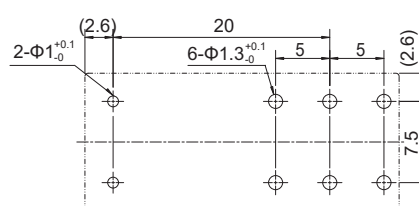


Schematics (BOTTOM VIEW)



Connect terminal #1 and #8 on the PC board

PC board mounting hole layout (BOTTOM VIEW)

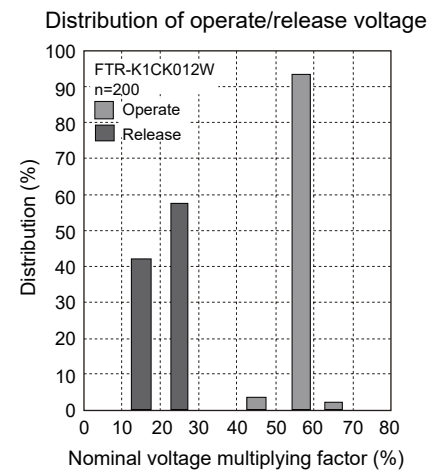
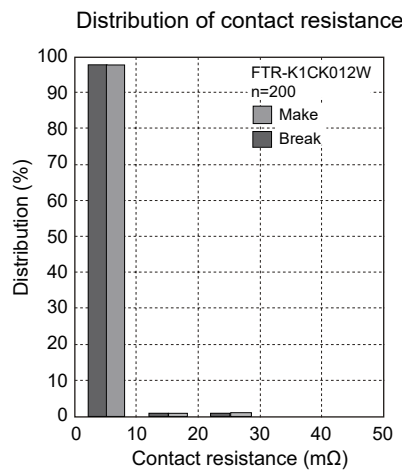
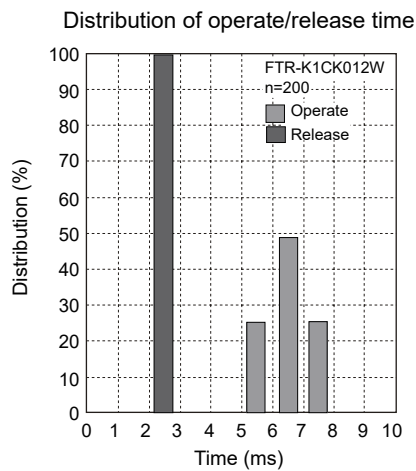
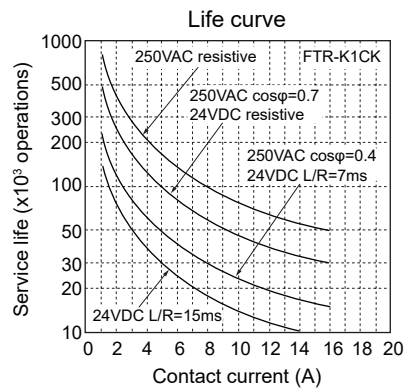
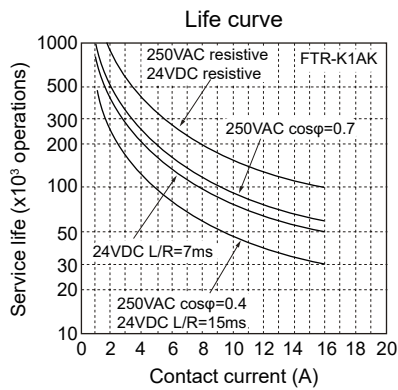
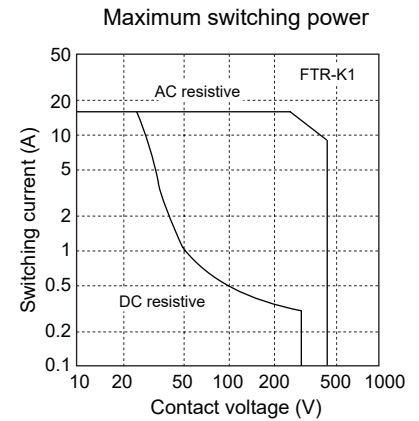
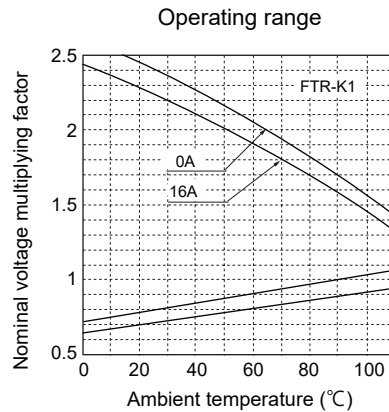
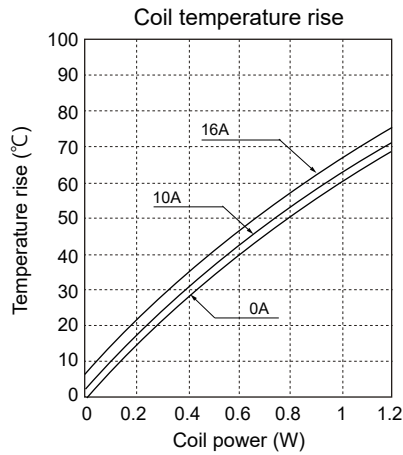


Dimensions of the terminals do not include thickness of pre-soldering.
Tolerance of PC board mounting hole layout : ± 0.1 unless otherwise specified.

Unit: mm
(): Reference value

■ 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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