

# POWER RELAY 1 POLE - 3A/5A, SLIM TYPE

## FTR-F3 Series

RoHS Compliant

### ■ FEATURES

- High density mounting  
Slim type with 7mm width and 142mm<sup>2</sup> mounting space
- High insulation  
Insulation distance: minimum 6mm between coil and contact  
(conforms to IEC 60065)  
Dielectric strength: 4kV  
Surge strength: 10kV
- Glow wire compliant type available which satisfies GWT required for relay in IEC/EN60335-1
- Cadmium free contact for eco-program
- Safety standards
- UL, CSA, VDE, CQC
- Plastic sealed relay, RTIII
- RoHS compliant



### ■ APPLICATIONS

Control of factory automation equipment, home appliances etc.

### ■ PART NUMBERS

[Example] FTR-F3 A A 012 E - HA - GW  
(a) (b) (c) (d) (e) (f) (g)

(a)	Relay type	FTR-F3 series
(b)	Contact configuration	A : 1a (1 Form A, SPST-NO)
(c)	Coil type (power)	A : 200mW
(d)	Coil rated voltage	012 : 5....24VDC Please refer to coil rating table
(e)	Contact material	E : AgNi
(f)	Contact rating	Nil : 3A type flux free HA : 5A type sealing confirmed KS : 5A type sealing confirmed
(g)	Special type	GW : Comply with GWEPT (IEC60695-2-11)

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

E.g.: Ordering code: FTR-F3AA012E-HA Actual marking: F3AA012E

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

## ■ SPECIFICATIONS

Item		Specifications		Remarks/Conditions	
		FTR-F3AA( )E	FTR-F3AA( )E-HA		
Contact Data	Configuration	1a (1 Form A, SPST)			
	Construction	Single			
	Material	AgNi			
	Resistance	Max. 100mΩ		Initial at 1A, 6VDC	
	Contact rating	3A, 125VAC/30VDC	5A, 250VAC/30VDC	Resistive	
	Max. carrying current	5A			
	Max. switching voltage	277VAC/30VDC			
	Max. switching power	750VA/90W	1,250VA/150W		
	Min. switching load *1	10mA, 5VDC			
Coil	Rated power (20°C)	200mW			
	Operate power	113mW			
	Operating temperature range	-40 °C to +70 °C		No frost	
Time	Operate	Max. 10ms		Without bounce, no diode	
	Release	Max. 10ms		Without bounce, no diode	
Life	Mechanical	Min. 5 x 10 <sup>6</sup> operations			
	Electrical	Min. 200 x 10 <sup>3</sup> operations	Min. 100 x 10 <sup>3</sup> operations	At rated load	
Insulation	Insulation resistance	Min. 1,000MΩ		At 500VDC	
	Dielectric strength	Open contacts	750VAC (50/60Hz) 1min		
		Coil to contacts	4,000VAC (50/60Hz) 1min		
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave		
	Clearance	6mm			
	Creepage	6mm			
	EN61810-1, VDE0435	Voltage	250V		
		Pollution	2		
Material group		III			
Others	Vibration resistance	Misoperation	10 to 55 to 10Hz single amplitude 0.75mm		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	Min. 100m/s <sup>2</sup> (11±1ms)		Coil ON/OFF, 3 axis, total 36 operations
		Endurance	Min. 1,000m/s <sup>2</sup> (6 ±1ms)		Coil OFF, 3 axis, total 18 operations
	Dimensions / Weight	7.0 x 20.3 x 15.0 mm / approx. 4g			
	Sealing	Plastic sealed RTIII			

\*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

## ■ COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance $\pm 10\%$ ( $\Omega$ )	Must Operate Voltage (VDC)	Must Release Voltage (VDC)	Rated Power (mW)
005	5	125	3.75	0.5	200
006	6	180	4.5	0.6	
009	9	405	6.75	0.9	
012	12	720	9	1.2	
018	18	1,620	13.5	1.8	
024	24	2,880	18	2.4	

Note 1: All values given in the coil table(s) are valid at 20°C ambient temperature, at zero contact current, without pre-energizing and are specified at pulse wave voltage.

Note 2: When applying a higher than rated coil voltage, please refer to the "coil temperature rise" and "operating range". Reference graphs for the effects on the relay operating behaviour.

## ■ SAFETY STANDARDS

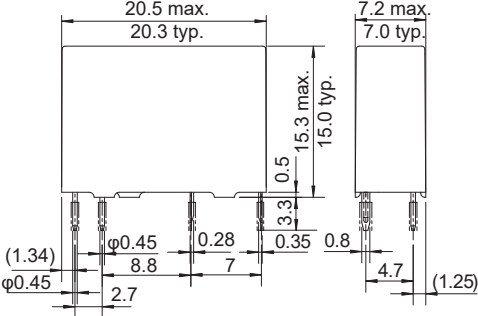
Type	Compliance	Contact Rating	
		FTR-F3AA( )E	FTR-F3AA( )E-HA
UL	Flammability: UL 94-V-0 (plastics)		
	UL508 File No. E63614	5A, 277VAC/30VDC (resistive) 6A, 277VAC (resistive) 3A, 277VAC/30VDC (resistive)	3A, 277VAC/30VDC (resistive) 6A, 277VAC (resistive) 5A, 277VAC/277VAC (resistive)
CSA	C22.2 No. 14 File No. LR 40304	1/10 HP, 125VAC 1/8 HP, 277VAC Pilot duty: D300	1/10 HP, 250VAC (UL only), 1/10HP 125VAC 1/8 HP, 277VAC Pilot duty: D300
VDE	IEC/EN61810-1	3A, 250VAC, $\cos\phi = 1$ 3A, 30VDC, L/R=0ms	5A, 250VAC, $\cos\phi = 1$ 5A, 30VDC, L/R=0ms
CQC	GB/T21711.1, GB15092.1 10002049449, 04001010925, 17002164382	3A,250VAC/30VDC 5A (except-KS type)	5A 250VAC/30VDC

## ■ PART NUMBER LIST

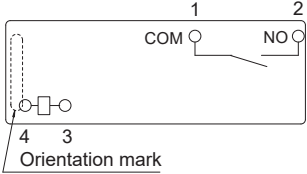
Part Number	Contact Configuration	Rated Power	Contact Material	Contact rating	Special type
FTR-F3AA( )E	1a (1 Form A)	Approx. 200mW	AgNi	3A, 125VAC/30VDC	-
FTR-F3AA( )E-KS					Plastic seal
FTR-F3AA( )E-GW					Comply with GWEPT
FTR-F3AA( )E-KS-GW					Plastic seal, comply with GWEPT
FTR-F3AA( )E-HA	1a (1 Form A)	Approx. 200mW	AgNi	5A, 250VAC/30VDC	-
FTR-F3AA( )E-HA-GW					Comply with GWEPT

## ■ DIMENSIONS

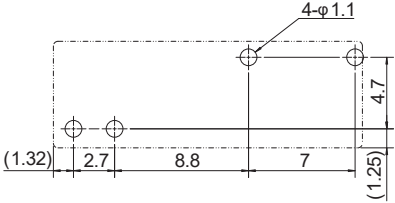
Dimensions



Schematics (BOTTOM VIEW)



PC board mounting hole layout (BOTTOM VIEW)



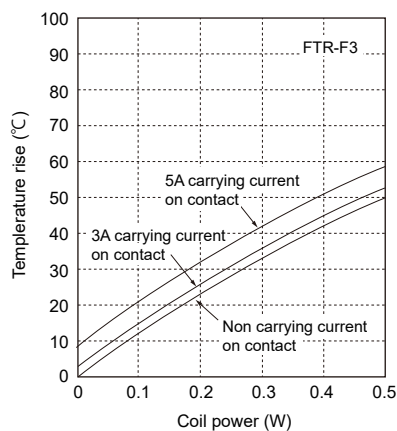
- Dimensions of the terminals do not include thickness of pre-soldering.
- Tolerance of PC board mounting hole layout :  $\pm 0.1$  unless otherwise specified.

Unit: mm  
( ) : Reference

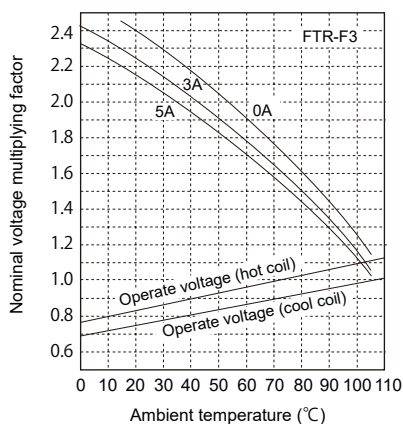
## CHARACTERISTIC DATA

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

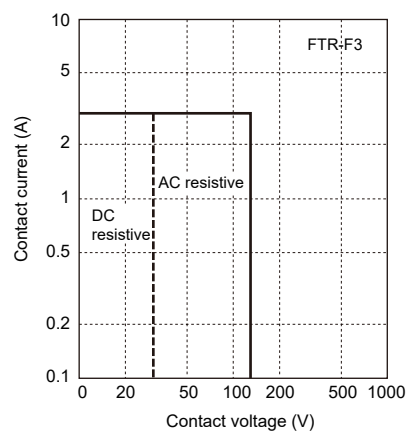
### Coil temperature rise



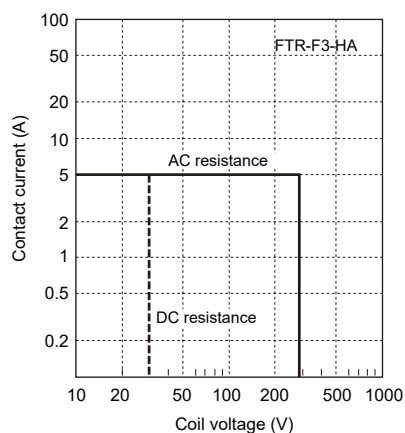
### Operating range



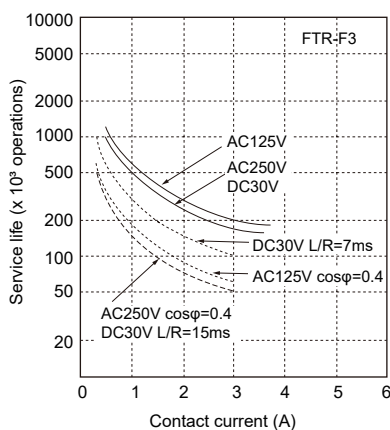
### Maximum switching power



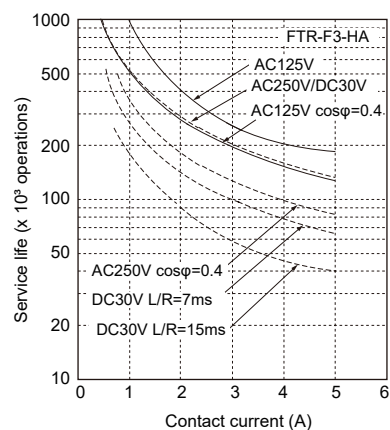
### Maximum switching power



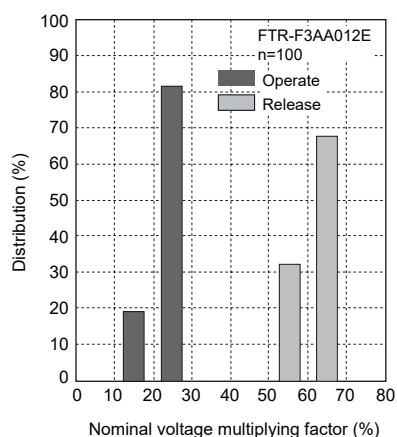
### Life curve - 3A type



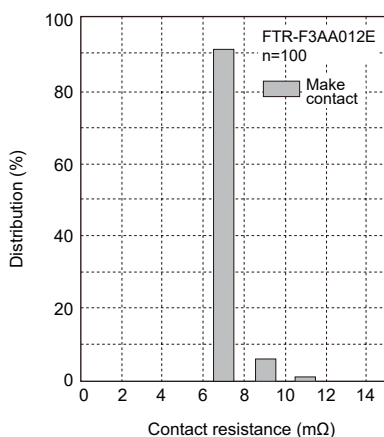
### Life curve - 5A type



### Distribution of operate/release voltage



### 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.

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