POWER RELAY
2 POLES - 8A LOW PROFILE TYPE

FTR-F1 R Series

RoHS Compliant

■ FEATURES

- DPST/DPDT 8A
- Low profile power relay (height 16.5mm) employing unique construction
- High insulation by employing reinforced insulation construction
  - Insulation distance: 8mm (between coil and contact)
  - Dielectric strength: 5,000V (between coil and contact)
  - Surge strength: 10,000V (between coil and contact)
- UL, CSA, VDE recognized
- Flux proof sealing, RTII
- RoHS Compliant

■ APPLICATIONS

Control of industrial equipment, home appliances, I/O modules etc.

■ PART NUMBERS

[Example] FTR-F1 A L 012 R - RG
(a) (b) (c) (d) (e) (f)

(a)	Relay type	FTR-F1 series
(b)	Contact configuration	A : 2a (2 Form A, DPST-NO) C : 2c (2 Form C, DPDT)
(c)	Coil type (power)	A : Standard type (530mW, 2 Form C) L : High sensitive type (400mW)
(d)	Coil rated voltage	12 : 1.5....110VDC (high sensitive type: 1.5....48VDC) Please refer to coil rating table
(e)	Contact rating	R : 8A
(f)	Special type	Nil : Standard type RG : Transparent cover type

Actual marking does not carry the type name : “FTR”

E.g.: Ordering code: FTR-F1AL005R Actual marking: F1AL005R

FTR-F1AA( )R(-RG) are not available

■ SPECIFICATIONS

Item			Specifications		Remarks/Conditions
			Standard type	Transparent type (-RG)	
Contact Data	Configuration		2a (2 Form A, DPST-NO), 2c (2 Form C, DPDT)		
	Construction		Single		
	Material		Movable: Gold plate silver tin oxide Stationary: Silver tin oxide		
	Resistance (initial)		Max. 100mΩ		At 1A, 6VDC
	Contact rating		8A, 250VAC/24VDC		Resistive
	Max. carrying current		8A		
	Max. switching voltage		400VAC/300VDC		
	Max. switching power		2,000VA/192W		
	Min. switching load *1		10mA, 5VDC		Reference
Coil	Rated power (20°C)		Standard type: 530~550mW *2 High sensitive type: 400mW		
	Oprate power (20°C)		Standard type: 260~270mW *2 High sensitive type: 225mW		
	Operating temperature range		-40 to +75 °C	-40 to +70 °C	No frost
Time	Operate		Max. 15ms		No diode, without bounce
	Release		Max. 5ms		No diode, without bounce
Life	Mechanical		Min. 20x 10^6 operations		
	Electrical (resistive)	AC load	Min. 50 x 10^3 operations		
		DC load	Min. 50 x 10^3 operations		
Insulation	Resistance (initial)		Min. 1,000MΩ		At 500VDC
	Dielectric strength	Open contacs	1,000VAC (50/60Hz), 1 minute		
		Coil to contacts	5,000VAC (50/60Hz), 1 minute		
		Adjacent contacts	3,000VAC (50/60Hz) 1 minute		
	Surge strength	Coil to contacts	10,000V/ 1.2 x 50μs standard wave		
	Clearance		8mm		
	Creepage		8mm		
	EN61810-1, VDE0435	Voltage	250V		
		Pollution degree	3		
		Material group	IIIa		
		Category	C / 250V (reference voltage) (VDE0110b)		
Others	Vibration resistance	Misoperation	10 to 55 to 10Hz single amplitude 0.825mm		Coil ON/OFF, 3 axis, total 6 cycles
		Endurance	10 to 55 to 10Hz single amplitude 1.65mm		Coil OFF, 3 axis, total 6 hours
	Shock resistance	Misoperation	Min. 100 m/s^2 (11±1ms)		Coil ON/OFF, 3 axis, total 36 operations
		Endurance	Min. 1,000 m/s^2 (6±1ms)		Coil OFF, 3 axis, total 18 operations
	Dimensions / Weight		12.8 x 29.0 x 16.5mm / Approx. 12.0g		
	Sealing		Flux proof, RTII		

*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.

*2: Standard sensitiveness is applicable for 2c (DPDT)

■ COIL DATA

530mW type (standard)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage*1 (VDC)	Must Release Voltage*1 (VDC)	Rated Power (mW)
1.5	1.5	4.2	1.05	0.15	530
005	5	47	3.5	0.5	
006	6	68	4.2	0.6	
009	9	155	6.3	0.9	
012	12	270	8.4	1.2	
024	24	1,100	16.8	2.4	
048	48	4,400	33.6	4.8	
060	60	6,800	42.0	6.0	
110	110	22,000	77.0	11.0	550

400mW type (high sensitive)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage*1 (VDC)	Must Release Voltage*1 (VDC)	Rated Power (mW)
1.5	1.5	5.6	1.125	0.15	400
003	3	22.5	2.25	0.3	
005	5	62	3.75	0.5	
006	6	90	4.5	0.6	
009	9	202	6.75	0.9	
012	12	360	9	1.2	
024	24	1,440	18	2.4	
048	48	5,760	36	4.8	

Note 1: All values given in the coil table(s) are valid at 20°C ambient temperature, at zero contactcurrent, 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
UL	Flammability: UL 94-V-0 (plastics)	
	UL 508 File No. E63614	8A, 24VDC (resistive) 8A, 250VAC (resistive) 1/6 hp, 125VAC 1/4 hp, 250VAC Pilot duty: C300, R300 (Note: Except -RG)
CSA	C22.2 No. 14 File No. LR40304	
VDE	IEC/EN61810-1 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	8A, 250 VAC (cosφ=1) 8A, 24VDC (0ms)

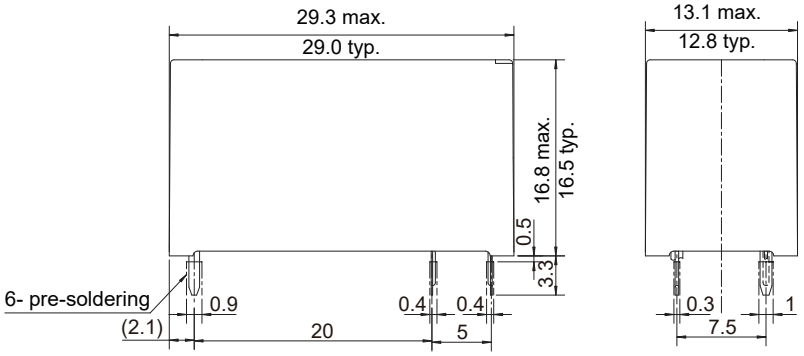
■ PART NUMBER LIST

Part Number	Contact Configuration	Rated Power	Special Type
FTR-F1AL( )R	2a (2 Form A)	Approx. 400mW	-
FTR-F1AL( )R-RG			Transparent cover
FTR-F1CA( )R	2c (2 Form C)	Approx. 530 to 550mW	-
FTR-F1CA( )R-RG			Transparent cover
FTR-F1CL( )R		Approx. 400mW	-
FTR-F1CL( )R-RG			Transparent cover

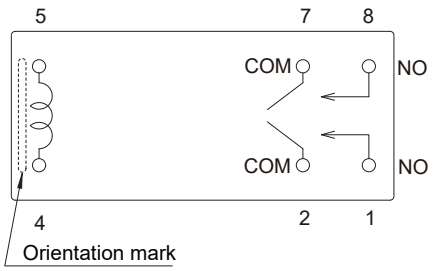
■ DIMENSIONS

FTR-F1A Type

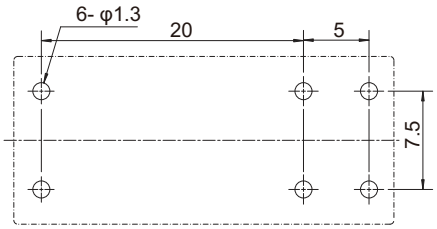
Dimensions



Schematics
(BOTTOM VIEW)

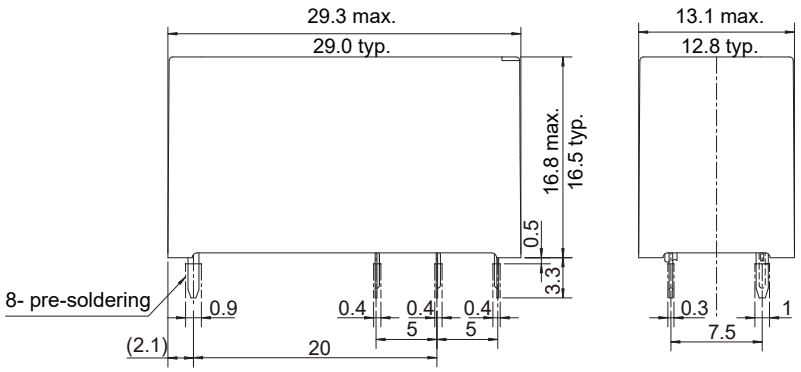


PC board mounting hole layout
(BOTTOM VIEW)

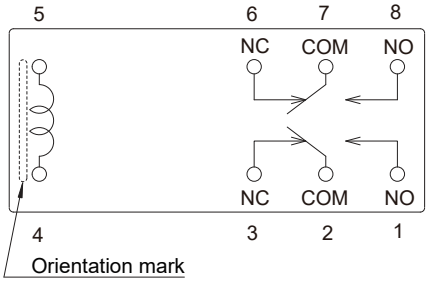


FTR-F1C Type

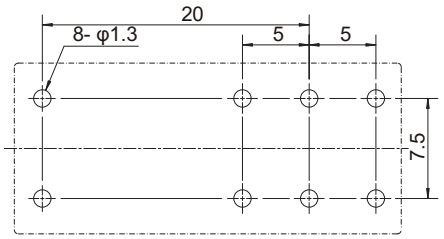
Dimensions



Schematics
(BOTTOM VIEW)



PC board mounting hole layout
(BOTTOM VIEW)



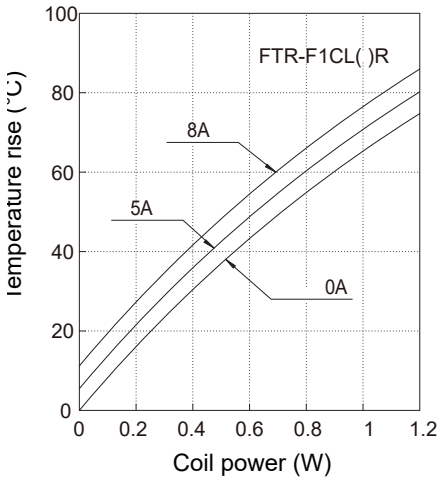
* Dimensions do not include tolerances.
* Dimensions of the terminals do not include thickness of pre-solder.
* Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.

Unit: mm
( ): Reference

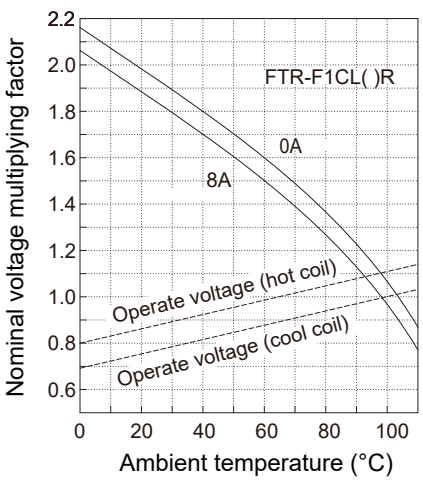
■ CHARACTERISTIC DATA

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

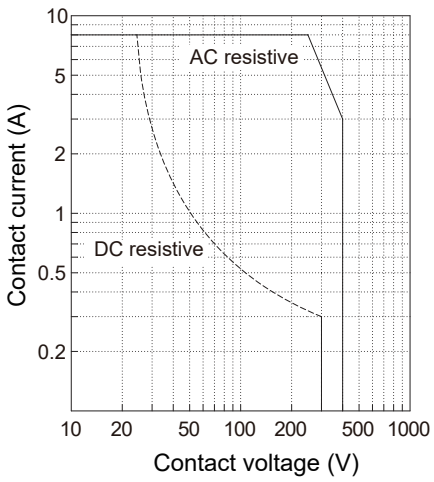
Coil temperature rise



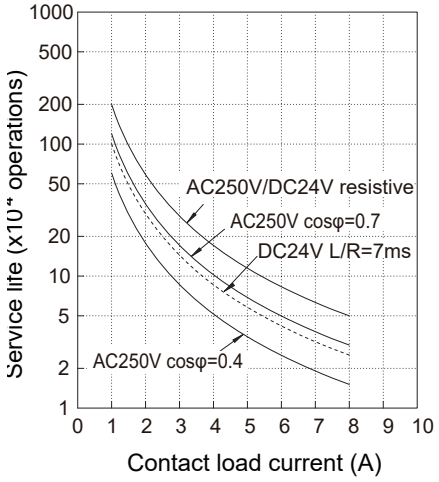
Operating range



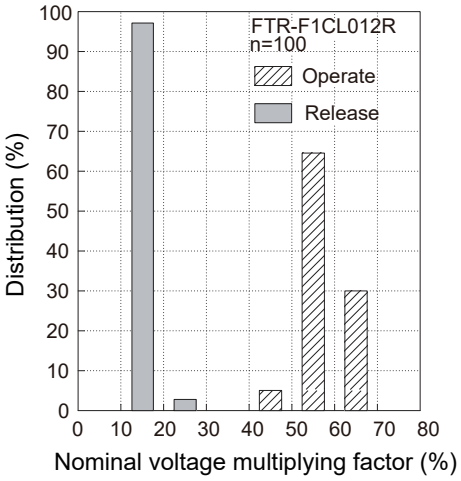
Maximum switching power



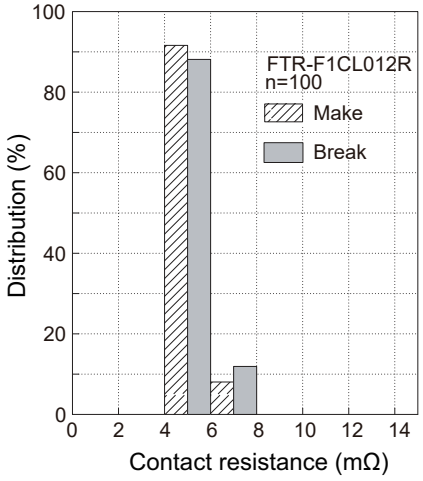
Life curve



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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