POWER RELAY

2 POLES - 5A Low Profile Type

FTR-F1 Series

FEATURES

- Low profile (height: 16.5mm)
- DPST/DPDT 5A
- High insulation
  (due to its reinforced insulation construction)
  Insulation Distance (between coil and contacts): 8mm min.
  Dielectric strength : 5,000 VAC
  Surge strength : 10,000 V
- Pin configuration compatible to VB
- UL, CSA, VDE, CQC recognized
- RoHS compliant (Please see page 6 for more information)



Part Numbers

[Example] FTR-F1 A A 005 V - RG

\- (a) (b) (c) (d) (e) (f)

(a)	Relay type	FTR-F1 : FTR-F1 series
(b)	Contact configuration	A : 2 form A (DPST-NO) C : 2 form C
(c)	Coil type / enclosure	A : Standard type (530mW) D : High sensitivity type (400mW contact material V type only)
(d)	Coil rated voltage	005 : 1.5....110VDC Coil rating table at page 3
(e)	Contact material / TV type	V : Gold plated silver alloy(standard type) T : Gold plated silver alloy (TV-3 rating type, only for 2 form A standard coil type)
(f)	Special type	Nil : Standard type RG : Transparent cover type

Actual marking does not carry the type name "FTR"
E.g.: Ordering code: "FTR-F1AA005V", actual marking: "F1AA005V"

■ **Specifications**

Item			Standard type F1 (A, C) A ( ) V	TV-3 rating F1 AA ( ) T	Sensitive type F1 (A, C) D ( ) V	Remarks / conditions
Contact data	Configuration		2 form A (DPST-NO) 2 form C	2 form A (DSDT-NO)	2 form A (DPST-NO) 2 form C (DPDT)	
	Construction		Single			
	Material		Movable: Gold plate silver tin oxide (AgSnO2) Stationary: Silver tin oxide			
	Resistance		Max.100mΩ at 6VDC, 1A			Initial
	Contact rating		5A, 250VAC / 24VDC			Resistive
	Max. carrying current		7A			
	Max. switching voltage		400VAC, 300VDC			
	Max. switching power		1250VA / 120W			
	Min. switching load *1		10 mA, 5VDC			
Coil	Rated power (20°C)		530mW, 110V type: 550mW		400mW	
	Operate power (20°C)		260mW, 110V type: 270mW		225mW	
	Operating temperature range		-40ºC ~ +75ºC (at rated voltage) -40ºC ~ +70ºC (Transparent cover type, -RG)			No frost
Timing data	Operate		Max. 15ms			without bounce, no diode
	Release		Max. 5ms			without bounce, no diode
Life	Mechanical		Min. 20 x 10^6 operations			
	Electrical (resistive)	AC contact rating	Min. 100 x 10^3 operations			At rated load
		DC contact rating	Min. 100 x 10^3 operations			At rated load
		Lamp load (TV-3)	-	25 x 10^3 operations min.	-	
Insulation	Insulation resistance		Min. 1000MΩ at 500VDC			
	Dielectric strength	Open contacts	1000VAC (50/60Hz), 1 minute			
		Coil contact	5000VAC (50/60Hz), 1 minute			
		Adjecent contacts	3000VAC (50/60Hz), 1 minute			
	Surge strength	Coil to contacts	10000V / 1.2 x 50μs standard wave			
	Clearance		8mm			
	Creepage		8mm			
	EN61810-1, VDE0435	Voltage	250V			
		Pollution	3			
		Material group	III a			
		Category	C / 250V (reference voltage) (VDE 0110b)			
Other	Vibration resistance	Misoperation	10Hz ~ 55Hz ~ 10Hz single amplitude 0.825mm			
		Endurance	10Hz ~ 55Hz ~ 10Hz single amplitude 1.65mm			
	Shock resistance	Misoperation	Min. 100m/s² (11 ± 1ms)			
		Endurance	Min. 1,000m/s² (6 ± 1ms)			
	Dimensions / weight		12.8 x 29.0 x 16.5 mm / approx. 12.0g			
	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 contions and expected reliability levels.

■ Coil Data

530mW standard type

Coil code	Rated Coil Voltage (VDC)	Coil Resistance +/-10%(Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (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	
018	18	610	12.6	1.8	
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 high sensitive type

Coil code	Rated Coil Voltage (VDC)	Coil Resistance +/-10%(Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (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: All values in the table are valid at 20°C and zero contact current, unless otherwise specified.

*: Specified operated values are valid for pulse wave 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.

Care shall be taken on the heat generated on PC board when maximum carrying current exceeds 10A. Please perform the confirmation test with actual conditions.

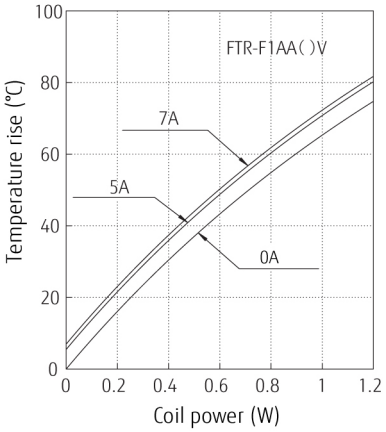
■ Safety Standards

Type	Compliance	Contact rating
UL	UL 508	Flammability: UL 94-V-0 (plastics)
CSA	C22.2 No. 14 File No. LR 40304	5A, 24VDC (resistive) 5A, 250VAC (resistive) 1/6 hp, 125VAC 1/4 hp, 250VAC Pilot duty: C300 Pilot duty: R300 (FTR-F1CA( )V) TV-3 (FTR-F1AA( )T) (except for -RG type)
VDE	IEC/EN61810-1 EN60065 clause 14.6.1 (FTR-F1AA ( )T) 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	5A, 250 VAC (cosφ=1) 2A, 250 VAC (cosφ=0.4) 5A, 24VDC (0ms) 2A/32A, 250VAC (FTR-F1AA( )T)
CQC	GB/T21711.1, GB15092.1 (No.17002164350)	5A, 250VAC (FTR-F1CA( )V)

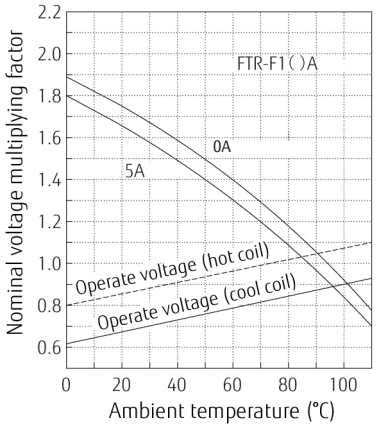
■ Characteristic Data (Reference)

* Characteristic data is not a guaranteed value, but measured values of samples from production line.

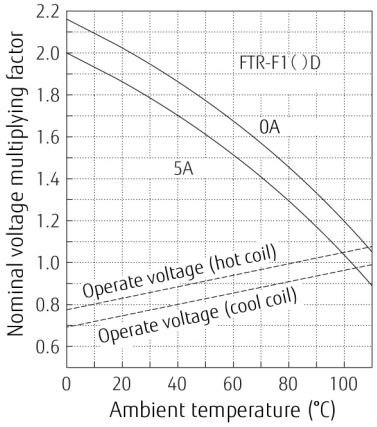
Coil temperature rise



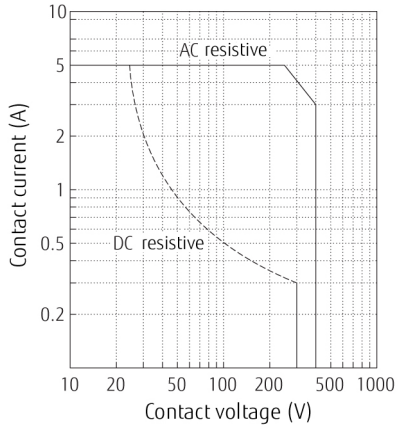
Operating range



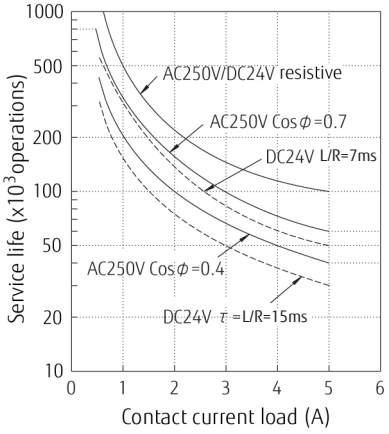
Operating range



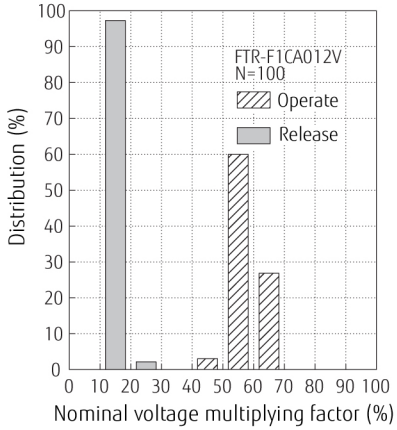
Maximum switching power



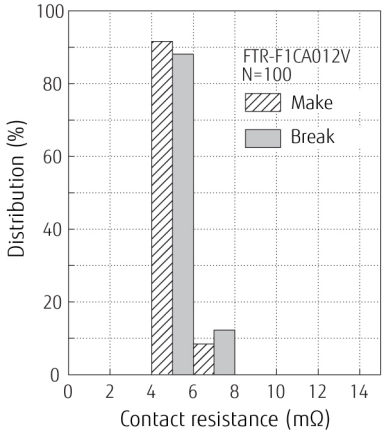
Life curve



Distribution of operate/release voltage



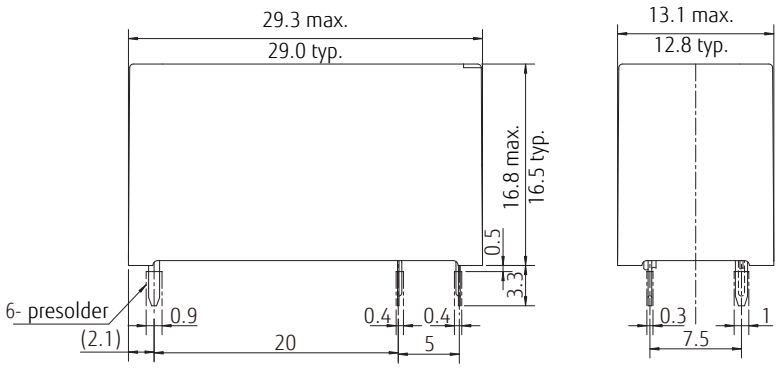
Distribution of contact resistance



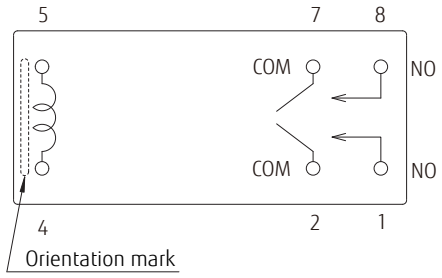
■ Dimensions

FTR-F1A Type

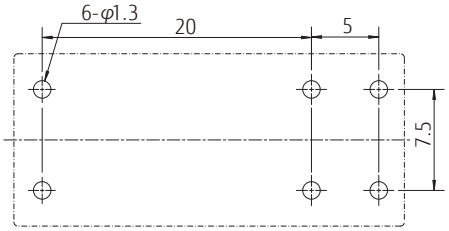
Dimensions



Schematics
(BOTTOM VIEW)

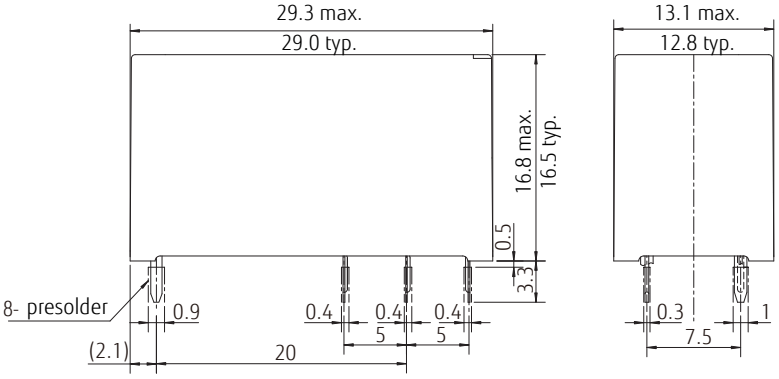


PC board mounting hole layout
(BOTTOM VIEW)

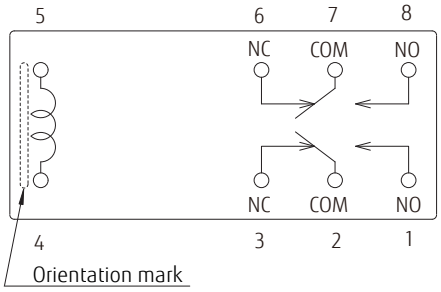


FTR-F1C Type

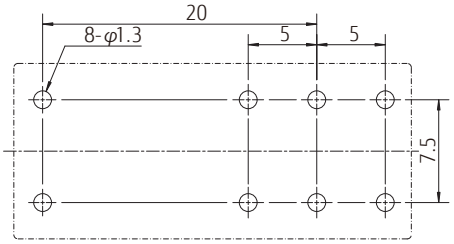
Dimensions



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

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:	Eip 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.

Contact

Japan
FCL COMPONENTS LIMITED
Shinagawa Seaside Park Tower
12-4, Higashi-shinagawa 4-chome,
Tokyo 140 0002, Japan
Tel: +81-3-3450-1682
Email: fcl-contact@cs.fcl-components.com

North and South America
FCL COMPONENTS AMERICA, INC.
2055 Gateway Place Suite 480,
San Jose, CA 95110 USA
Tel: +1-408-745-4900
Email: fcai.components@fcl-components.com

Europe
FCL COMPONENTS EUROPE B.V.
Diamantlaan 25
2132 WV Hoofddorp, Netherlands
Tel: +31-23-556-0910
Email: info.fceu@cs.fcl-components.com

Asia Pacific
FCL COMPONENTS ASIA PTE LTD.
No. 20 Harbour Drive, #07-01B
Singapore 117612
Tel: +65-6375-8560
Email: fcal@fcl-components.com

China
FCL COMPONENTS (SHANGHAI) CO., LTD.
Unit 1105, Central Park - Jing An,
No.329 Heng Feng Road, Shanghai 200070,
China
Tel: +86-21-3253 0998
Email: fcsh@fcl-components.com

Web: www.fcl-components.com/en/

© 2024 FCL Components Limited. All rights reserved. All trademarks or registered trademarks are the property of their respective owners.

FCL Products are intended for general use, including without limitation, in personal, household and office environments, in buildings and for ordinary use in the industry. FCL Products are not intended to be used in applications where extremely high safety is required (”High Safety Required Applications”), such as, but not limited to, applications in nuclear facilities, in aircraft automatic flight control, in air traffic control, in mass transit system control, in missile launch system, in weapon systems, in medical equipment for life support or any application involving a direct serious risk of physical injury or death.
Please do not use FCL Products without securing the sufficient safety and reliability required for the High Safety Required Applications. In addition, FCL shall not be liable against the customer and/or any third party for any claims or damages arising in connection with the use of FCL Products in the High Safety Required Applications.
FCL warrants that its Products, if properly used and services, will conform to their specification and will be free from defects in material and workmanship for twelve months from delivery.
The implied warranties of merchantability and fitness for a particular purpose and all other warranties, representations and conditions, express or implied by statute, trade usage or otherwise, expect as set forth in this warranty, are excluded and shall not apply to the Products delivered.

The contents, data and information in this datasheet are provided by FCL Components Limited as a service only to its user and only for general information purposes. The use of the contents, data and information provided in this datasheet is at the users’ own risk.
FCL has assembled this datasheet with care and will endeavor to keep the contents, data and information correct, accurate, comprehensive, complete and up to date.
FCL Components Limited and affiliated companies do however not accept any responsibility or liability on their behalf, nor on behalf of its employees, for any loss or damage, direct, indirect or consequential, with respect to this datasheet, its contents, data, and information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof.
Nor do FCL Components Limited and affiliated companies accept on their behalf, nor on behalf of its employees, any responsibility or liability with respect to these datasheets, its contents, data, information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof. Rev. February 1, 2024.