FUJITSU

POWER RELAY
2 POLES - 8A Low Profile Type
FTR-F1 R Series

■ FEATURES

- DPST/DPDT 8A
- Low profile power relay (height 16.5 mm) employing unique construction
- High insulation by employing reinforced insulation construction
  Insulation distance: 8 mm (between coil and contact)
  Dielectric strength: 5 kV (between coil and contact)
  Surge strength: 10 kV (between coil and contact)
- Pin configuration compatible to VB
- UL, CSA, VDE, recognized
- Flux proof sealing, RTII
- RoHS Compliant
  Please see page 6 for more information

■ PARTNUMBER INFORMATION

[Example] FTR-F1 (a) A (b) L (c) 005 (d) R (e) - RG (f)

(a)	Relay type	FTR-F1	: FTR-F1-Series
(b)	Contact configuration	A C	: 2 form A (SPST-NO) : 2 form C (DPDT)
(c)	Coil type / enclosure	A L	: Standard type (530mW) : High sensitive type (400mW)
(d)	Coil rated voltage	005	: 1.5...110VDC (High sensitive type: 1.5...110V) Coil rating table at page 3
(e)	Contact rating	R	: 8A
(f)	Special type	Nil RG	: Standard type : Transparent cover type

Actual marking does not carry the type name : "FTR"
E.g.: Ordering code: FTR-F1AL005R Actual marking: F1AL005R

■ SPECIFICATION

Item			Standard type F1 (A, C) L ( ) R	Transparent cover F1 (A, C) L ( ) R - RG
Contact Data	Configuration		2 form A (DPST-NO), 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	
	Max. carrying current *1		8A	
	Max. switching voltage		400VAC/ 300VDC	
	Max. switching power		2,000VA, 192W	
	Min. switching load *2		10mA, 5VDC	
Life	Mechanical		Min. 20x 10^6 operations	
	Electrical	AC load	Min. 50 x 10^3 operations	
		DC load	Min. 50 x 10^3 operations	
Coil Data	Rated Power (at 20 ° C)		Standard type: 530mW /High sensitive type: 500mW	
	Operate Power (at 20 ° C)		Standard type: 260mW /High sensitive type: 225mW	
	Operating temperature range		-40 to +75 °C (no frost)	-40 to +70 °C (no frost)
Timing Data	Operate (at nominal voltage)		Max. 15ms (no diode, without bounce)	
	Release (at nominal voltage)		Max. 5ms (no diode, without bounce)	
Insulation	Resistance (Initial)		Min. 1,000MΩ at 500VDC	
	Dielectric strength	Open contacts	1,000VAC (50/60Hz) 1min.	
		Coil and contacts	5,000VAC (50/60Hz) 1min.	
		Adjacent contacts	3,000VAC (50/60Hz) 1 min.	
	Surge strength	Coil and contacts	10.000V/ 1.2 x 50μs standard wave	
	Clearance		8 mm	
	Creepage		8 mm	
	EN61810-1, VDE0435	Voltage	250V	
		Pollution degree	3	
		Material group	IIIa	
		Category	C / 250V (reference voltage) (VDE0110b)	
Other	Vibration Resistance	Misoperation	10 to 55 to 10 Hz single amplitude 0.825mm	
		Endurance	10 to 55 to 10 Hz single amplitude 1.65mm	
	Shock	Misoperation	Min. 100 m/s² (11 ± 1ms)	
		Endurance	Min. 1,000 m/s² (6 ± 1ms)	
	Weight		Approximately 12 g	
	Sealing		Flux proof, RTII	

***** 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 RATING

400mW type (Standard)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	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	

530mW type (Standard)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *	Rated Power (mW)
1.5	1.5	5.6	1.125	0.15	530
003	003	47	3.5	0.5	
005	005	68	4.2	0.6	
006	006	155	6.3	0.9	
009	009	270	8.4	1.2	
012	012	1,100	16.8	2.4	
024	024	4,400	33.6	4.8	
048	048	6,800	42.0	6.0	
110	110	22,000	77.0	11.0	

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.

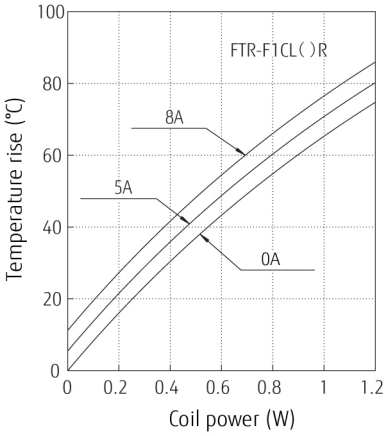
■ SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 508 (No. E63614)	Flammability: UL 94-V0 (plastics)
		8A, 24VDC (resistive) 8A, 250VAC (resistive) 1/6 hp, 125VAC 1/4 hp, 250VAC Pilot duty: C300, R300 except -RG
CSA	C22.2 No. 14 (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)

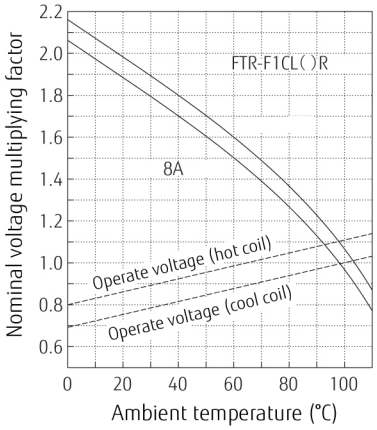
■ CHARACTERISTIC DATA (Reference)

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

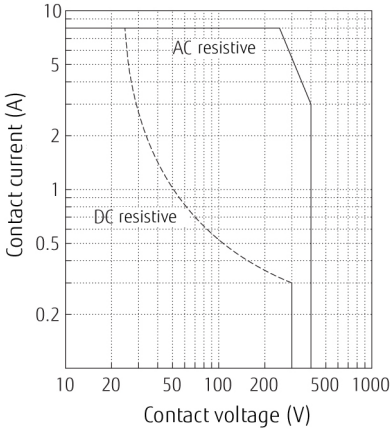
Coil temperature rise



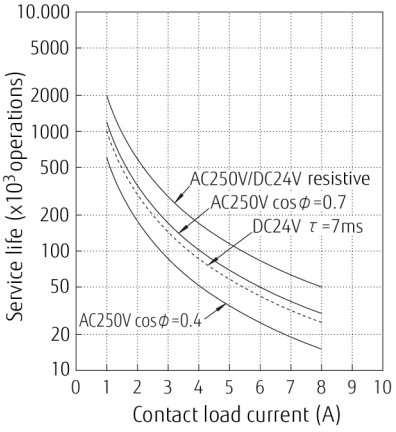
Operating range



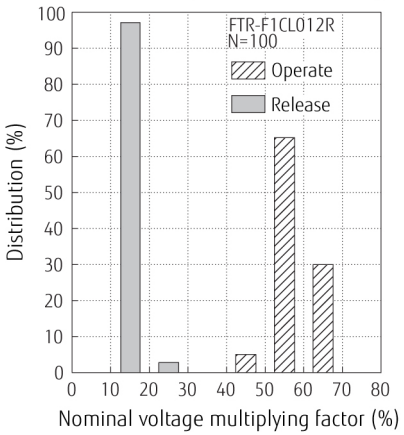
Maximum switching power



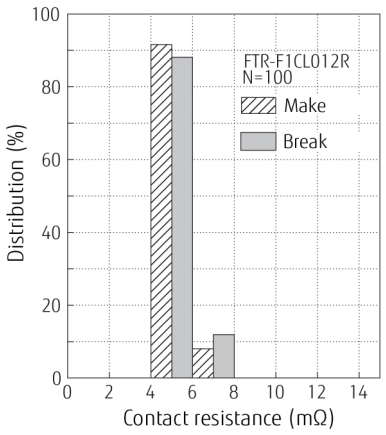
Life curve



Distribution of operate/release voltage



Distribution of contact resistance

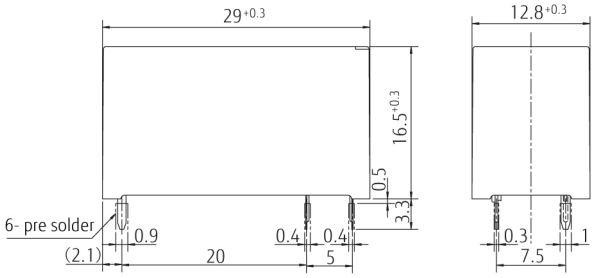


■ DIMENSIONS

Unit: mm

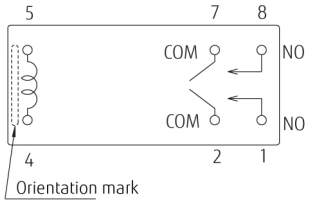
FTR-F1A type

● Dimensions



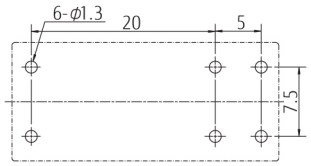
* Dimensions of the terminals do not include thickness of pre-solder.

● Schematics



● PC board mounting hole layout

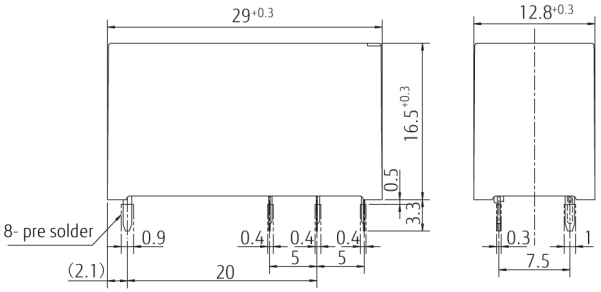
(BOTTOM VIEW)



Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.

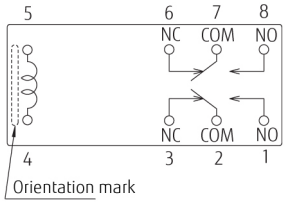
FTR-F1C type

● Dimensions



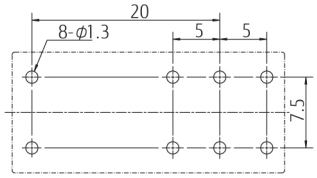
* Dimensions of the terminals do not include thickness of pre-solder.

● Schematics



● PC board mounting hole layout

(BOTTOM VIEW)



Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.

Unit: mm

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.

RoHS Compliance and Lead Free Information

1. General Information

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives.
  As per Annex III of directive 2011/65/EU.
- All relays are lead-free. Please refer to Lead-Free Status Info for older date codes at:
  http://www.fujitsu.com/downloads/MICRO/fcai/relays/lead-free-letter.pdf
- 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.

2. Recommended Lead Free Solder Condition

- Recommended solder 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 Temperature:	30-60W maximum 350-360˚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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