POWER RELAY
2 POLES - 25A/40A LATCHING RELAY

FTR-L1 Series

RoHS Compliant

■ FEATURES

- 25A, 277VAC and 40A, 277VAC 2-coil latching relays
- 1a+1b contact configuration suitable for switching AC power supply units
- Conform to IEC62368-1, safety requirement for Audio/Video, Information and Communication Technology Equipment
- Contact gap: Minimum 4.5mm
- Through hole
- Flux proof



■ APPLICATIONS

AI servers power supply unit
Uninterruptible power supply (UPS)
Automatic transfer switch (ATS)
Various power supplies

■ PART NUMBERS

[Example] FTR-L1 R C C 012 Y
(a) (b) (c) (d) (e) (f)

(a)	Relay type	FTR-L1 series
(b)	Contact rating	Nil : 25A R : 40A
(c)	Contact configuration	C : 1a+1b (1 Form A + 1 Form B)
(d)	Operating function	C : 2-coil latching
(e)	Rated coil voltage	Please refer to coil rating table
(f)	Contact material	Y : Silver tin oxide

Actual marking does not carry the type name: “FTR”
E.g.: Ordering code: FTR-L1CC012Y Actual marking: L1CC012Y

■ SPECIFICATIONS

Item			Specifications		Remarks/Conditions
			FTR-L1	FTR-L1R	
Contact Data	Configuration		1a+1b (1 Form A + 1 Form B)		
	Material		Silver tin oxide		
	Contact rating		25A, 277VAC	40A, 277VAC	Resistive
	Contact resistance		Max. 100mΩ (at 1A)	Max. 10mΩ (at 20A)	
	Continuous carrying current		25A	40A	Continuous, at 85°C
	Min. switching load *1		1A, 12VDC		
Coil	Rated power (20°C)		2,400mW		
	Pulse width		150 to 200ms		
	Operating temperature range		-40°C to +85°C		No frost
Time	Set/reset		Max. 25ms (at nominal voltage) Max. 9ms (at twice the nominal voltage)		Without bounce
Life	Mechanical		100 x 10^3 ops.		At 1A, 12VDC, Resistive
	Electrical (resistive)		30 x 10^3 ops. (at 25A, 277VAC)	100 ops. (at 40A, 277VAC)	NO or NC, Resistive load, at 85°C
				10 x 10^3 ops. (at 36A, 277VAC)	
				10 x 10^3 ops. (at making 16A, carrying 40A, breaking 16A, 277VAC)	
Insulation	Insulation resistance		1,000MΩ		At 500VDC
	Dielectric strength	Open contacts	2,500VAC, 1 minute		
		Adjacent contacts	4,000VAC, 1 minute		
		Coil to contacts	5,000VAC, 1 minute		
Others	Vibration resistance	Misoperation	10 to 55 to 10Hz, single amplitude 1mm		Set/Reset states, 3 axes, 1 cycle per axis, 6 cycles total
		Endurance	10 to 55 to 10Hz, single amplitude 1mm		Set/Reset states, 3 axes, 2 hours per axis, 12 hours total
	Shock resistance	Misoperation	196m/s^2 (11±1ms)		Set/Reset states, 3 axes, 6 directions, 3 shocks per direction, 36 shocks total
		Endurance	1,000m/s^2 (6±1ms)		Set/Reset states, 3 axes, 6 directions, 3 shocks per direction, 36 shocks total
	Dimensions / Weight		50 x 20 x 27mm / Approx. 45g		
	Sealing		Flux proof		

*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.

Electrical characteristics mentioned above are the values at JIS standard condition (temperature 15 to 35°C, relative humidity 25 to 75%, atmospheric pressure 86k to 106 kPa) unless otherwise specified.

■ COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Set Voltage *1 (VDC)	Reset Voltage *1 (VDC)	Nominal Power (mW)
012	12	60	9.6	9.6	2,400
024	24	240	19.2	19.2	

Note: All values in the table are valid at 20°C and zero contact current, unless otherwise specified.
*1: Specified operated values are valid for pulse wave voltage.

■ SAFETY STANDARDS

Type	Compliance	Contact rating	
		FTR-L1	FTR-L1R
cULus	UL508 C22.2 No.14 File No. E63615	NO or NC, 25A, 277VAC, Resistive, 30,000 cycles, 85°C, 1 sec. ON / 9 sec. OFF	NO or NC, 40A, 277VAC, Resistive, 100 cycles, endurance only, 85°C, 1 sec. ON / 9 sec. OFF
			NO or NC, 36A, 277VAC, Resistive, 10,000 cycles, 85°C, 1 sec. ON / 9 sec. OFF
TUV	IEC/EN61810-1 Certificate No. R50678890	NO or NC, 25A, 277VAC, Resistive, 30,000 cycles, 85°C, 1 sec. ON / 9 sec. OFF	NO or NC, 40A, 277VAC, Resistive, 100 cycles, endurance only, 85°C, 1 sec. ON / 9 sec. OFF
	IEC/EN61810-1 IEC/EN62368-1 clauses 5.4.2, 5.4.3, 5.4.4, 5.4.9, 5.5.1, 5.5.5, G.2, L.1, K.7 Certificate No. R50678890		NO or NC, 36A, 277VAC, Resistive, 10,000 cycles, 85°C, 1 sec. ON / 9 sec. OFF

■ INSULATION DISTANCE

Item		FTR-L1	FTR-L1R
Clearance / Creepage	Open contacts	4.5mm (contact gap) / 4.8mm	
	Adjacent contacts	11.5mm / 13.8mm	
	Coil to contacts	7.2mm / 9.8mm	

■ INSULATION CHARACTERISTICS (IEC61810-1)

Item	FTR-L1	FTR-L1R
Rated voltage	277VAC	
Over voltage category	III	
Impulse withstand voltage	4kV	
Category of protection	RT II	
Pollution degree	3	
Material group	IIIa	
Type of insulation	Reinforced insulation	
Type of interruption	Full disconnection	
Glow wire test (IEC60695-2-11)	750°C	
Flammability (UL94)	V-0	

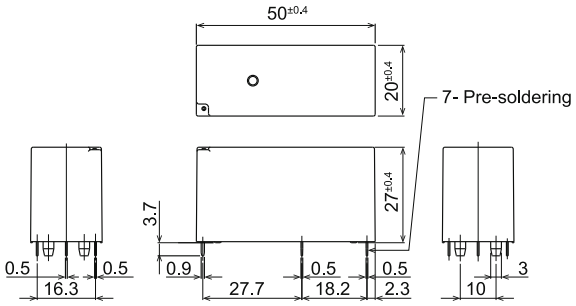
■ PART NUMBER LIST

Part Number	Contact rating	Contact Configuration	Operating function	Contact Material
FTR-L1CC( )Y	25A, 277VAC	1a+1b	2-coil latching	Silver tin oxide
FTR-L1RCC( )Y	40A, 277VAC			

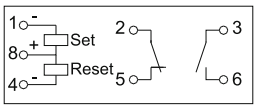
■ DIMENSIONS

FTR-L1CC( )Y

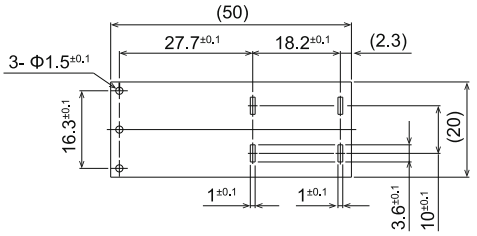
• Dimensions



• Schematics (BOTTOM VIEW)

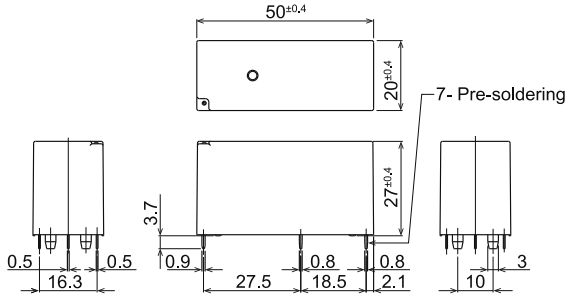


• PC board mounting hole layout (BOTTOM VIEW)

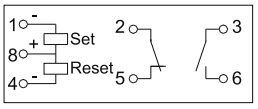


FTR-L1RCC( )Y

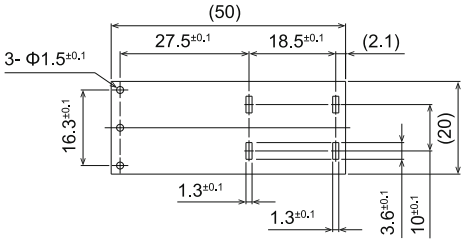
• Dimensions



• Schematics (BOTTOM VIEW)



• PC board mounting hole layout (BOTTOM VIEW)

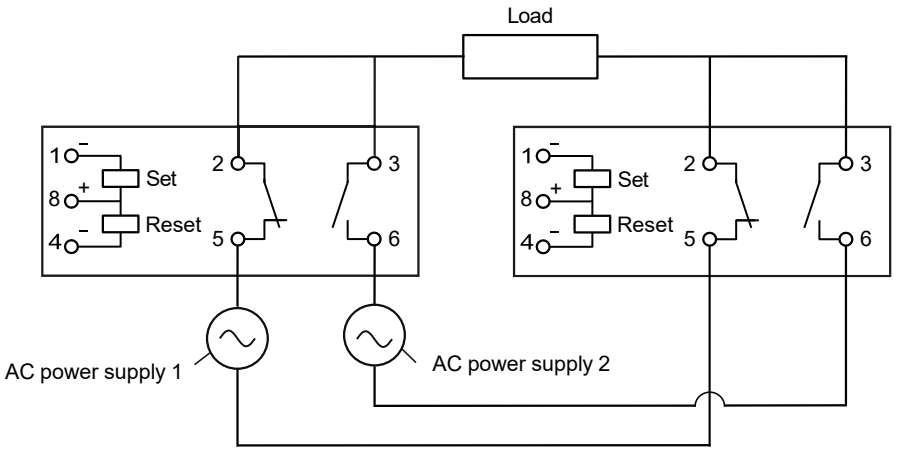


• Dimensions of the terminals do not include thickness of pre-soldering.
• Dimensions do not include tolerances. Please ask specification in case you need tolerances.

Unit: mm
( ): Reference

Definition of set/reset state:
When a pulse of the rated voltage is applied to the set coil (between pins 8 and 1), the contact between pins 2 and 5 opens, and the contact between pins 3 and 6 closes.
Conversely, when a pulse of the rated voltage is applied to the reset coil (between pins 8 and 4), the contact between pins
3 and 6 opens, and the contact between pins 2 and 5 closes.
The state in which the contact between pins 3 and 6 is closed is defined as the set state, and the state in which the contact between pins 2 and 5 is closed is defined as the reset state.

■ CONNECTION EXAMPLE OF A DUAL POWER SOURCE SWITCHING CIRCUIT



(BOTTOM VIEW)

• This relay is designed so that the break contact opens before the make contact closes. However, an arc between the contacts may cause a short circuit. Excessive current may occur during switching, potentially leading to relay failure. Therefore, please consider appropriate design measures to address voltage and phase differences between the AC power sources.

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.
- Please connect relay coils according to specified polarity.

Notes for latching relays

- Latching relays are shipped in the state reset, but state may change due to shock during transportation or mounting. Before using the relays, it is advisable to bring the relays in necessary state (set or reset) and program a circuit sequence. Otherwise, it will or will not operate simultaneously with power activation.
- Please connect relay coils according to specified polarity.
- Do not apply voltage to both set coil and reset coil at a time

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 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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