FUJITSU

POWER RELAY

2 POLES-2A High insulation/wide gap

FTR-C1 Series

■ FEATURES

- 2 Poles, 2 form C
- Contact gap: more than 0.6mm
- High surge voltage: 2,500V between open contacts
  5,000V between coil & contact
  Complies with Telcordia (former Bellcore) 2nd level surge
- Dielectric strength: 1,500VAC between open contacts
  3,000VAC between coil and contact
- Dimensions of large contact gap relay
  Height: 9.4mm maximum (THT)
  9.7mm maximum (SMT)
  Length: 15.2mm maximum
  Width: 7.7mm maximum
- Conforms to IEC60950/ EN60950/UL1950/CSA C 22.2 No. 950 working voltage 250V (supplementary)
- High insulation: Clearance: min 2.0mm (coil and contacts)
  Creepage: min 2.5mm (coil and contacts)
- Low power consumption 280mW (latching type 140mW)
- RoHS compliant. Please see page 9 for more information
- Plastic sealed

■ PARTNUMBER INFORMATION

[Example] FTR-C1 (a) C (b) A (c) 012 (d) G (e) - B05 (f)

(a)	Relay type	FTR-C1	: FTR-C1-Series
(b)	Contact configuration	C G S	: Through hole type : Surface mount type : Surface mount type reduced mounting area
(c)	Coil type / enclosure	A B	: Standard type : Single coil latching type
(d)	Coil rated voltage	012	: 3.....24 VDC Coil rating table at page 3
(e)	Contact material	G	: Gold plated silver palladium (stationary contact) Silver palladium (movable contact)
(f)	Tape / reel version	Nil B05	: Tube packing : Tape / reel packing, only available for SMT type

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

E.g.: Ordering code: FTR-C1CA012G Actual marking: C1CA012G

■ SPECIFICATION

Item			Non-latching FTR-C1 ( ) A	Latching FTR-C1 ( ) B
Contact Data	Configuration		2 form C	
	Construction		Bifurcated	
	Material		Gold plated silver palladium (stationary contact) Silver palladium (movable contact)	
	Resistance (Initial)		Max. 150mΩ at 1A, 6VDC	
	Contact rating resistive		1A, 30VDC / 0.3A, 125VAC	
	Max. Switching Voltage		250VAC / 220VDC	
	Max. Switching Power		62.5VA / 30W	
	Max. Carry Current		2A	
	Min. Switching Load *		0.01mA, 10mVDC	
Life	Mechanical		Min. 10 x 10^6 operations	
	Electrical (resistive)		Min. 100 x 10^3 operations at 0.3A, 125VAC / 1A, 30VD	
Coil Data	Rated Power		280 to 300mW	140 to 180mW
	Operate Power		158 to 162mW	158 to 162mW
	Pulse width		-	Min. 20ms
	Operating temp range		-40°C to +85°C (no frost)	
	Storage temperature / humidity		-40°C to +85°C / 5% to 85% RH (no frost)	
Timing Data	Operate (at nominal voltage)		Max. 6ms (without bounce)	
	Release (at nominal voltage)		Max. 6ms (without bounce)	
Insulation	Resistance (Initial)		Min. 1,000MΩ at 500VDC	
	Dielectric strength	Open contacts	1,500VAC (50/60Hz) 1min	
		Adjacent contacts	1,500VAC (50/60Hz) 1min	
		Contacts to coil	3,000VAC (50/60Hz) 1min	
	Surge strength	Contacts to coil	5,000V, 2 x 10μs	
	Clearance	Open contacts	0.6mm	
		Adjacent contacts	1.0mm	
		Contacts to coil	2.0mm	
	Creepage	Open contacts	0.6mm	
		Adjacent contacts	1.0mm	
		Contacts to coil	2.5mm	
Other	Vibration Resistance	Misoperation>1us	10 to 55 to 10 Hz single amplitude 1.65mm	
		Endurance	10 to 55 to 10 Hz single amplitude 2.5mm	
	Shock	Misoperation>1us	Min. 500m/s^2 (11+/-1ms)	
		Endurance	Min. 1,000m/s^2 (6+/-1ms)	
	Weight		Approximately 2g	
	Sealing		RT III (plastic sealed)	

* Minimujm 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

Standard type

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *	Nominal Coil Power (mW)
003	3	32.1	2.25	0.3	280
4.5	4.5	72.3	3.38	0.45	
005	5	89.3	3.75	0.5	
012	12	514	9	1.2	
024	24	1,920	18	2.4	300

Latching type

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Set Voltage (VDC) *	Reset Voltage (VDC) *	Nominal Coil Power (mW)
003	3	64.0	+2.25	- 2.25	140
4.5	4.5	145	+3.38	- 3.38	
005	5	179	+3.75	- 3.75	
012	12	1,029	+9	- 9	
024	24	3,200	+18	- 18	180

Note: All values in the table are valid for 20°C and zero contact current.
* Specified operate values are valid for pulse wave voltage.
Note: Please use at rated coil voltage. Please perform the confirmation test with actual conditions.

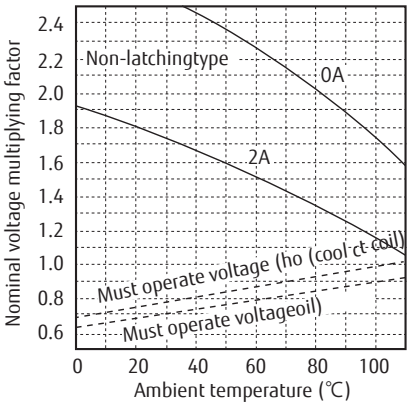
■ SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 508 E63615	Flammability: UL 94-V0 (plastics)
		0.3A, 125 VAC (general use) (UL) 0.5A, 125VAC (CSA) 2A, 30VDC (general use) 0.3A, 110VDC (general use)
CSA	C22.2 No. 14 LR 40304	

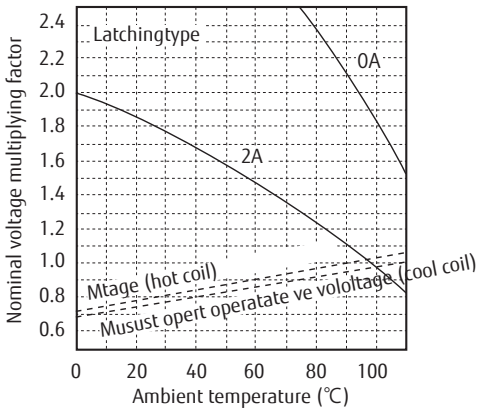
Comply with Telcordia specifications and meet BSI Marking only for UL, CSA

■ CHARACTERISTIC DATA

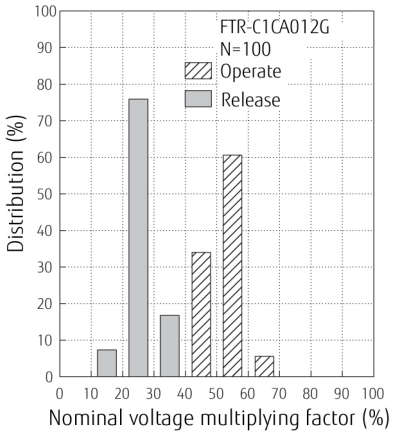
Operating range



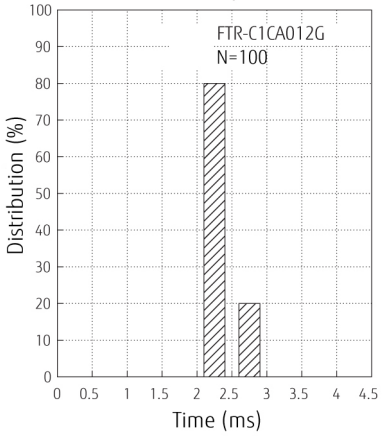
Operating range



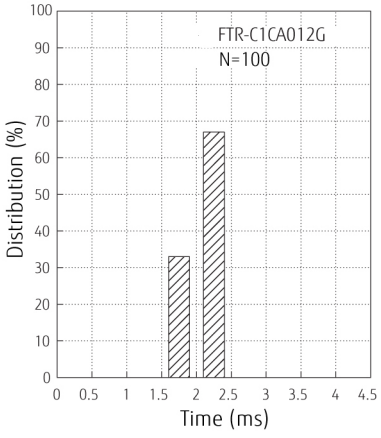
Distribution of operate/release voltage



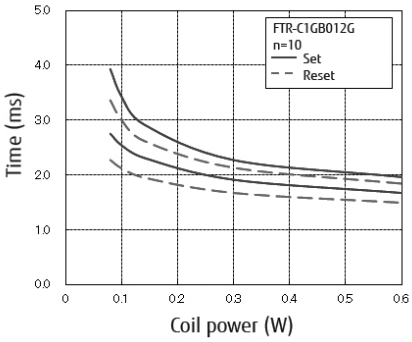
Distribution of operate time



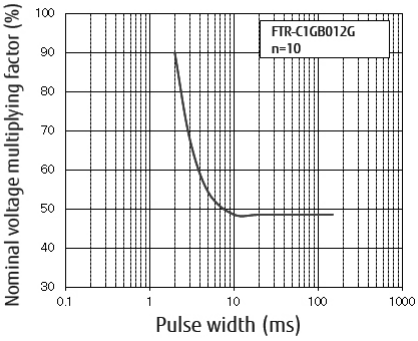
Distribution of release time



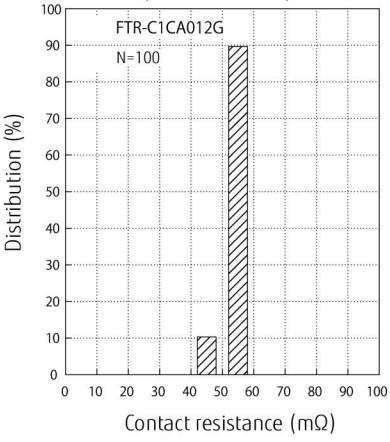
Set/Reset time characteristics



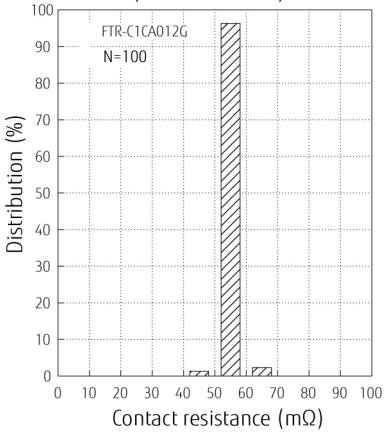
Pulse characteristics



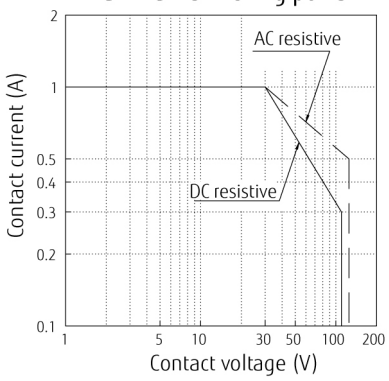
Distribution of contact resistance
(Make contacts)



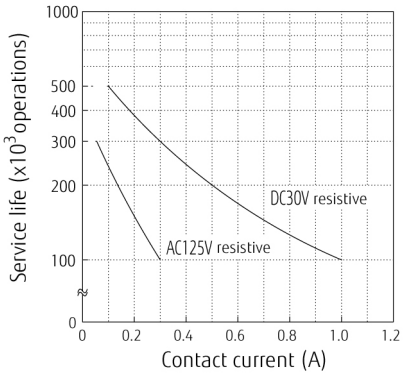
Distribution of contact resistance
(Break contacts)



Maximum switching power



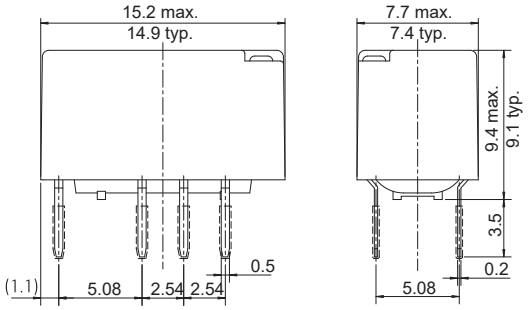
Life curve



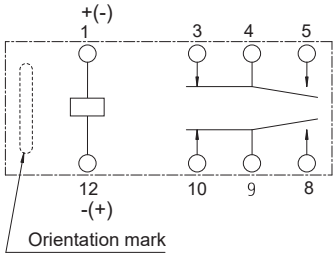
■ DIMENSIONS

Through hole type

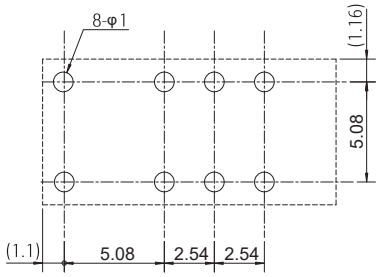
●Dimensions



● Schematics (BOTTOM VIEW)

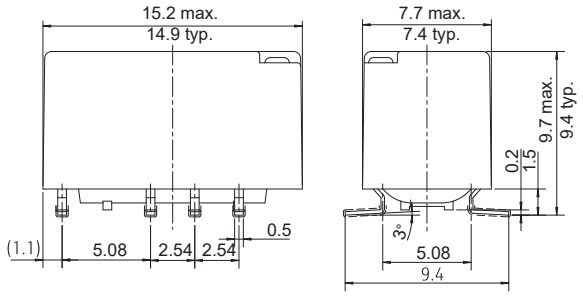


● Recommended PCB layout (BOTTOM VIEW)

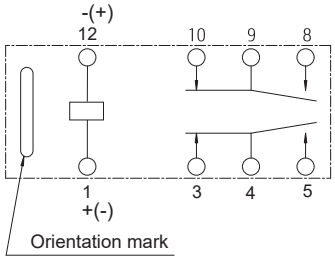


Surface mount type

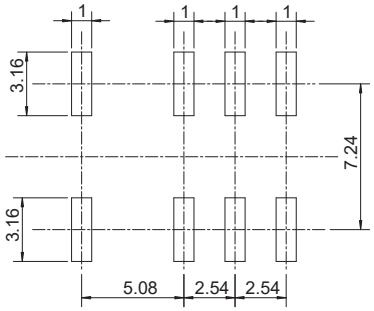
●Dimensions



● Schematics (TOP VIEW)

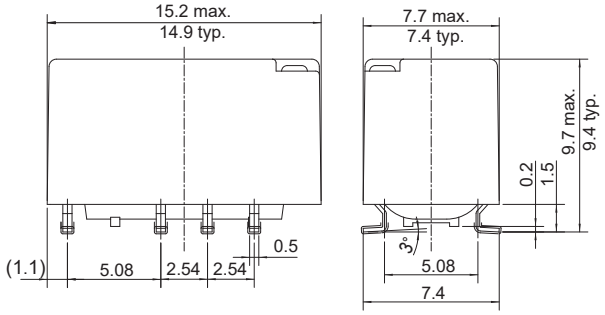


● Recommended PCB layout (TOP VIEW)

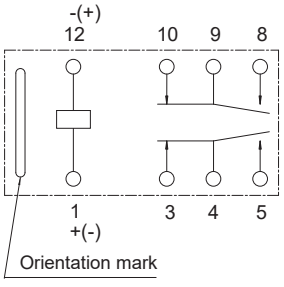


Surface mount (space saving) type

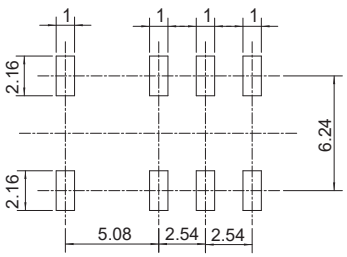
●Dimensions



● Schematics (TOP VIEW)



● Recommended PCB layout (TOP VIEW)



Note: (...) : dimensions are reference

Unit: mm

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

Note: Dimensions do not include tolerances. Please ask specification in case you need tolerances.

Note: Tolerance of PCB layout: ±0.1 unless otherwise specified.

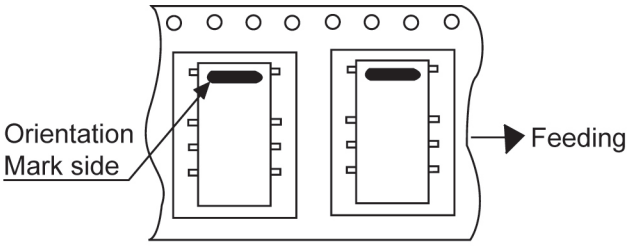
■ RECOMMENDED SOLDERING CONDITIONS SMT

(TEMPERATURE PROFILE, please see page 9)

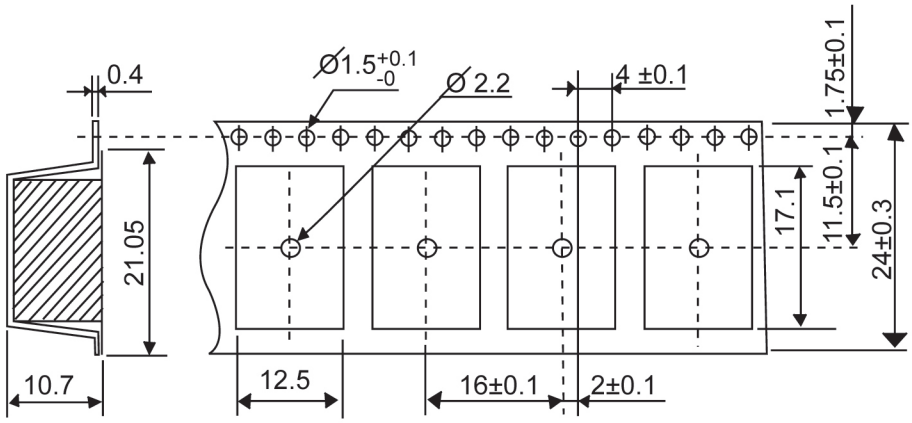
Note: 1.Temperature profiles show the temperature of PC board surface.
2. Please perform soldering test with your actual PC board before mass production, since the temperatures of PC board surfaces vary according to the size of PC board, status of parts mounting and heating method.

■ TAPE & REEL PACKAGING SPECIFICATION

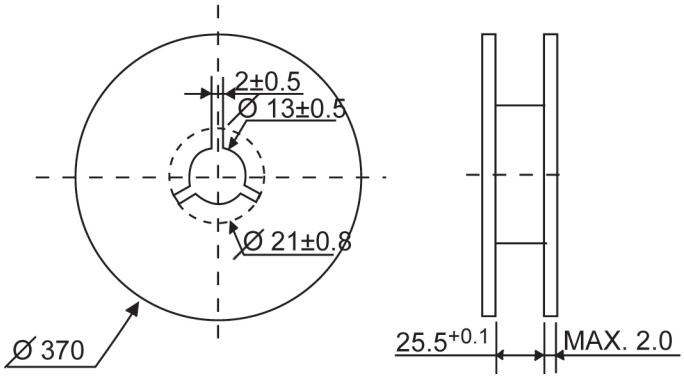
1. Taping standards: JIS C 0806 and RC-10092B (EIAJ)
2. Tape type: TB2416 or TE2416
3. Reel type: RD24D
4. Quantity of 1 reel: 500 pieces



Tape Dimensions:



Reel Dimensions:



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 for flow soldering type.
- 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.

Cautions for latching relays

- Laching relays are shipped in the state set, 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.
- 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 Fujitsu 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 with 90 sec.
Soldering: Dip within 5 sec. at 255°C±5°C solder bath

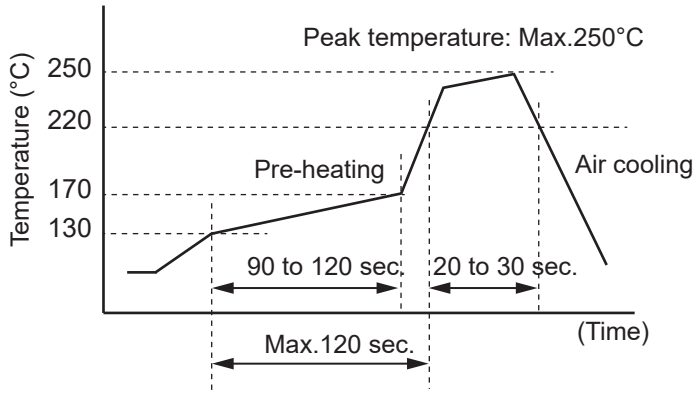
Relay must be cooled by air immediately after soldering

Solder by Soldering Iron:

Soldering Iron: 30-60W
Temperature: maximum 340-360˚C
Duration: maximum 3 sec.

Refow Solder Condition (Applicable only for reflow capable type)

Recommended reflow soldering profile
IRS (infrated reflow soldering)



We highly recommend that you confirm your actual solder conditions

3. Moisture Sensitivity

- SMT versions of FTR-C1 relays in Tape & Reel package will be shipped in Moisture Barrier Bag (MBB).
- Moisture Sensitivity Level (MSL) of FTR-C1 relay is indicated on the packing caution label.
- Relays must be stored in the unopened MBB at strage conditions <40℃/90% RH for a maximum 1 year.
- SMT versions of FTR-C1 relays in tube packing will not be shipped in MBB. Therefore, these relays shall be dried by baking before reflow soldering process according to IPC/Jedex J-STD-033.

4. Tin Whiskers

- Dipped SnAgCu solder is known as presenting a low risk to tin whisker development. No considerable length wisker was found by our in house test.

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