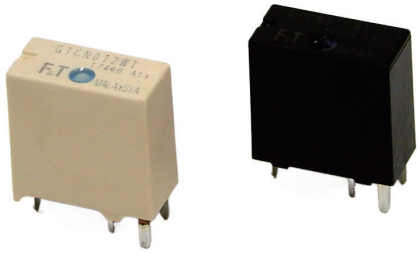
COMPACT POWER RELAY
1 POLE - 25A (FOR AUTOMOTIVE APPLICATIONS)

FTR-G1 Series

RoHS Compliant

■ FEATURES

- Compact for high density packaging
- High contact capacity with proven contact material (min.100,000 operations, at 25A, 14V locked motor load)
- Coil power savings (640mW nominal achived with state-of-the-art magnetic analysis/design)
- Ease of PCB layout (all terminals on perimeter, coil and contact terminals separated)
- Lower noise (60dB average at 5cm)
- Plastic sealed
- Through hole reflow capable type available
- RoHS compliant



■ APPLICATIONS

- Power window
- Door lock
- Tilt steering
- Sunroof
- Power seat
- Wiper/IWW
- Retractable antenna

■ PART NUMBERS

[Example] FTR-G1 C N 012 W1 - RW

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

(a)	Relay type	FTR-G1 series
(b)	Contact configuration	C : 1c (1 Form C)
(c)	Contact gap	N : 0.25mm
(d)	Coil rated voltage	012 : 9....12VDC Please refer to coil rating table
(e)	Contact material	W1 : Silver-tin oxide indium
(f)	Soldering	Nil : Standard (Flow soldering) RW : Reflow capable (THR)

Actual marking: F3CA012EActual marking does not carry the type name: “FTR”

E.g.: Ordering code: FTR-G1CN010W1 Actual marking: G1CN010W1

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■ SPECIFICATIONS

Item			Specifications		Remarks/Conditions
			Standard	Reflow capable (-RW)	
Contact Data	Configuration		1c (1 Form C)		
	Material		Silver-tin oxide indium		
	Contact voltage drop		Max. 100mV (after stabilization)		At 1A, 6VDC
	Contact rating		25A, 14VDC		Locked motor load
	Max. carrying current *1		25A/1 hour		25°C, 100% rated coil voltage
	Max. switching voltage		16VDC		
	Max. switching current		35A		
	Min. switching load *2		1A, 6VDC		Reference
Coil	Rated power		640mW		
	Operate power		237mW		
	Operating temperature range		-40 °C to +85 °C	-40 °C to +125 °C	No frost
Time	Operate		Max. 10ms		Without bounce
	Release		Max. 5ms		Without bounce
Life	Mechanical		Min. 10 x 10^6 operations		
	Electrical		*Min. 100 x 10^3 operations (at 25A, 14VDC, inrush power window motor) Min. 100 x 10^3 operations (at 20A, 14VDC, inrush door locked motor)		
Insulation	Insulation resistance (initial)		Min. 100MΩ		At 500VDC
	Dielectric withstanding voltage	Open contacts	500VAC, 1 min.		
		Coil to contacts	500VAC, 1 min.		
Others	Vibration resistance	Misoperation	10 to 200Hz, 44m/s^2 (4.5G), constant acceleration		Coil ON/OFF, 3 axis, total 6 cycles
		Endurance	10 to 200Hz, 44m/s^2 (4.5G), constant acceleration		Coil OFF, 3 axis, total 6 hours
	Shock resistance	Misoperation	100m/s^2 minimum (11±1ms)		Coil ON/OFF, 3 axis, total 36 operations
		Endurance	1,000m/s^2 minimum (6±1ms)		Coil OFF, 3 axis, total 18 operations
	Dimensions / Weight		6.6×13.7×13.5 mm / Approx. 3.5g		
	Sealing		Plastic sealed cat III		

* 1 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.

* 2 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.

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■ COIL DATA

• Standard type

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage*1 (VDC)	Must Release Voltage*1 (VDC)
009	9	126	5.4 (at 20°C) 6.8 (at 85°C)	0.7 (at 20°C) 0.9 (at 85°C)
010	10	160	6.5 (at 20°C) 8.2 (at 85°C)	0.8 (at 20°C) 1.0 (at 85°C)
012	12	225	7.3 (at 20°C) 9.2 (at 85°C)	1.0 (at 20°C) 1.3 (at 85°C)

• Reflow capable type

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage*1 (VDC)	Must Release Voltage*1 (VDC)
009	9	126	5.4 (at 20°C) 6.8 (at 85°C) 7.6 (at 125°C)	0.7 (at 20°C) 0.9 (at 85°C) 1.0 (at 125°C)
010	10	160	6.5 (at 20°C) 8.2 (at 85°C) 9.2 (at 125°C)	0.8 (at 20°C) 1.0 (at 85°C) 1.1 (at 125°C)
012	12	225	7.3 (at 20°C) 9.2 (at 85°C) 10.3 (at 125°C)	1.0 (at 20°C) 1.3 (at 85°C) 1.4 (at 125°C)

Note: All values in the table are valid for 20 °C and zero contact current, unless otherwise indicated.

*1: Specified operate values are valid for pulse wave voltage.

■ PART NUMBER LIST

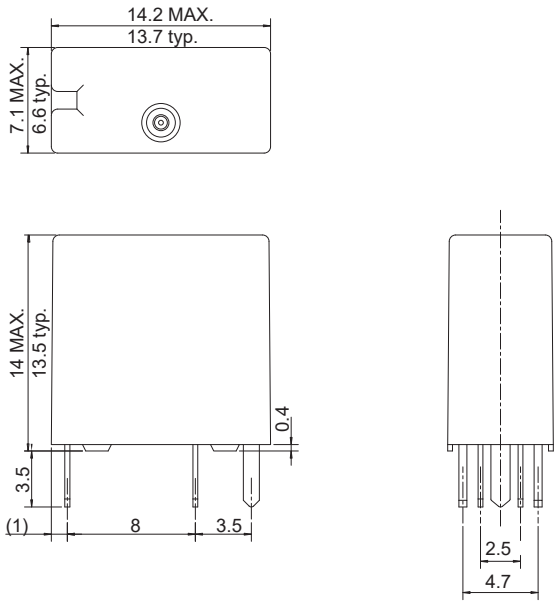
part number	Contact configuration	Contact gap	Contact material	Soldering
FTR-G1CN( )W1	1c (1 Form C)	0.25mm	Silver-tin oxide indium	Standard (Flow soldering)
FTR-G1CN( )W1-RW				Reflow capable (THR)

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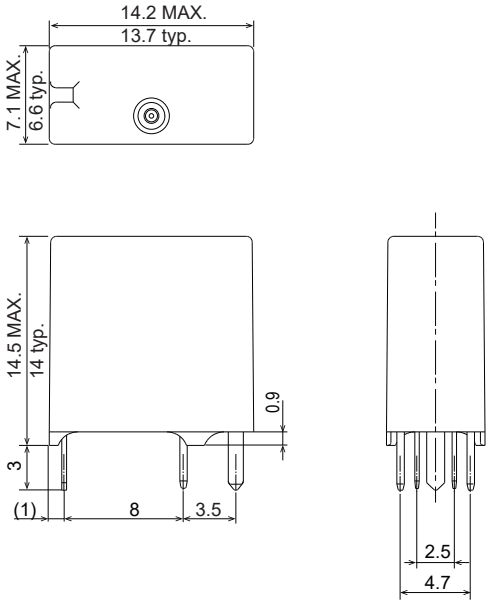
■ DIMENSIONS

Dimensions

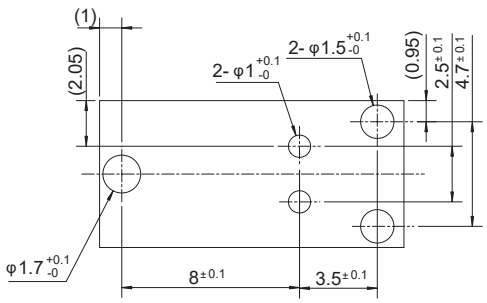
● Standard type



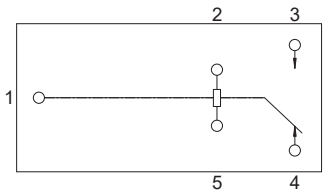
● Reflow capable type



PC board mountig hole layout
(BOTTOM VIEW)



Schematics
(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.

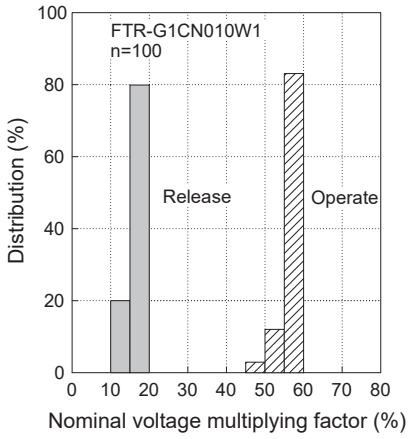
( ) : Reference
Unit: mm

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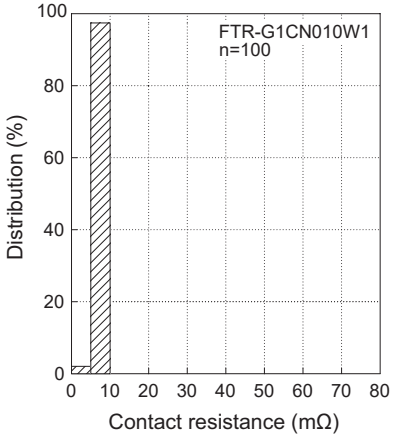
■ CHARACTERISTIC DATA

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

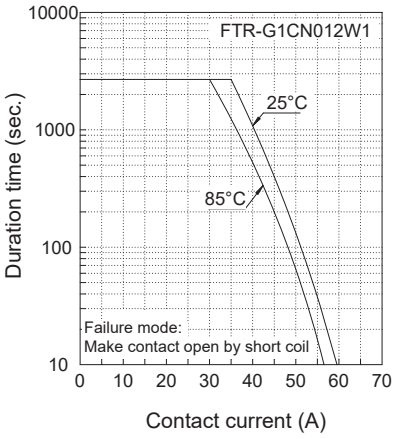
Distribution of operate/release voltage



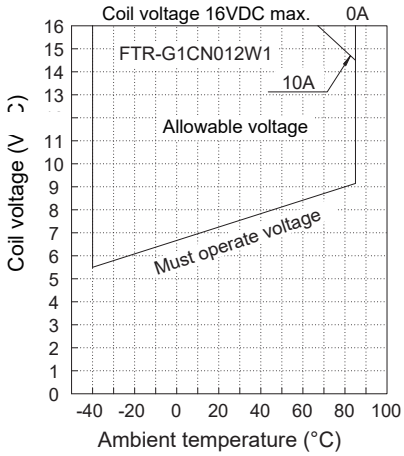
Distribution of contact resistance



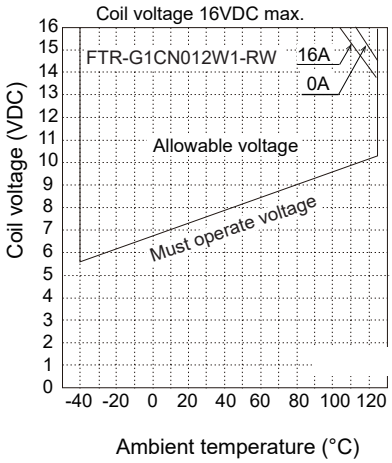
Contact current



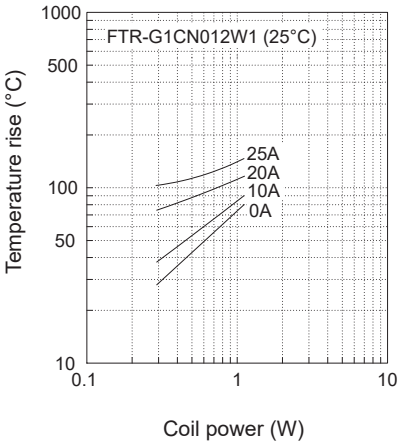
Ambient temperature vs voltage (standard type)



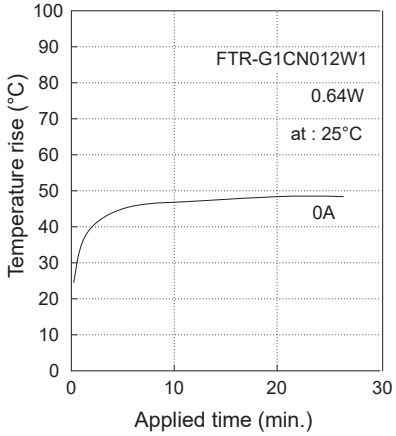
Ambient temperature vs voltage (reflow capable type)



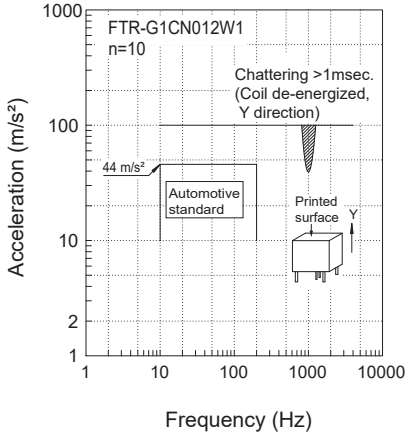
Coil temperature rise



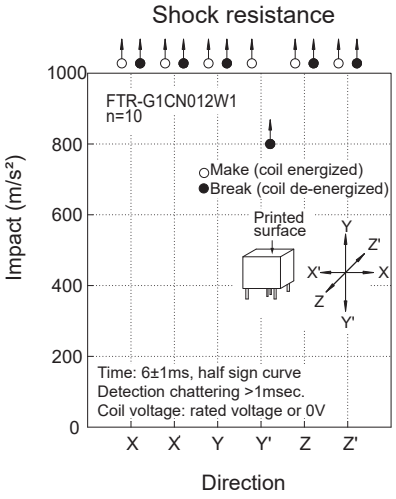
Coil temperature rise



Vibration resistance



Shock resistance



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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.

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

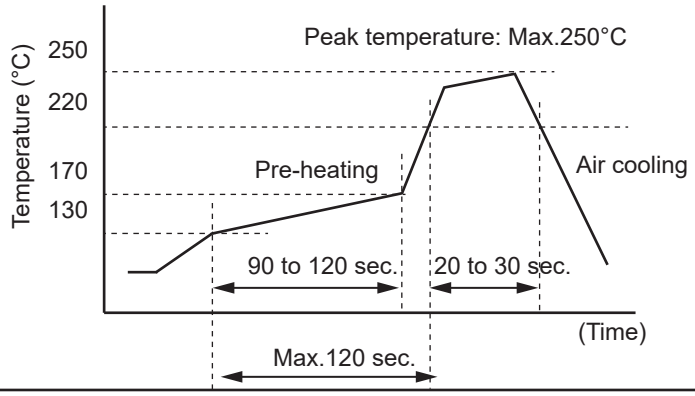
Solder by Soldering Iron:

Soldering Iron:	30-60W
Temperature:	maximum 350-360˚C
Duration:	maximum 3 sec.

Reflow Solder Condition:

(Applicable only for reflow capable type)

Recommended reflow soldering profile:
IRS (infrated reflow soldering)



Important Notes for reflow Soldering

- Temperature shall be measured at PC boartd uppler surface.
- Temperature at PC board upper surface may be changed depending on size of PC board, components mounted on the PC board and/or heating method. Please perform the confiramtion test with your actual PC board.
- This reflow condition is applicable only for reflow-capable relays. Do not reflow reflow-incapable relays.

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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