FUJITSU

COMPACT POWER RELAY
1 POLE - 25A (For Automotive Applications)
FTR-G1 Series

■ FEATURES

- Compact for high density packaging
- High contact capacity with proven contact material (min. 100,000 operations, 14V, 25A)
- 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

Please see page 6 for more information

■ APPLICATIONS

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

■ PARTNUMBER INFORMATION

[Example] FTR-G1 (a) C (b) N (c) 010 (d) W1 (e) - RW (f)

(a)	Relay type	FTR-G1	: FTR-G1 Series
(b)	Contact configuration	C	: 1 form C
(c)	Contact gap	N	: 0.25 mm
(d)	Coil rated voltage	010	: 9.....12 VDC Coil rating table at page 3
(e)	Contact material / TV type	W1	: Silver-tin oxide indium
(f)	Soldering	Nil RW	: Standard (Flow soldering) : Reflow capable (THR)

Actual marking does not carry the type name: "FTR"
E.g.: Ordering code: FTR-G1CN010W1 Actual marking: G1CN010W1

■ SPECIFICATION

Item			FTR-G1	
			Standard	Reflow capable
Contact Data	Configuration		1 form C	
	Material		Silver-tin oxide indium ($AgSnO_2$)	
	Contact voltage drop		Max. 100mV at 1A, 6VDC (after stabilization)	
	Contact rating		25A at 14VDC (locked motor load)	
	Max. carrying current *1		25A/1 hour (25 °C, 100% rated coil voltage)	
	Max. switching voltage		16VDC (reference)	
	Max. switching current		35A (reference)	
	Min. switching load * 2		1A, 6VDC	
Life	Mechanical		Min. 10 x 10^6 operations	
	Electrical		* Min. 100 x 10^3 operations, 14VDC, 25A inrush power window motor * Min. 100 x 10^3 operations 14VDC, 20A inrush door locked motor	
Coil Data	Rated power		625 to 643mW	
	Operate power		237mW	
	Operating temperature range		-40 °C to +85 °C (no frost)	-40 °C to +125 °C (no frost)
Timing Data	Operate (at nominal voltage)		Max. 10 ms (without bounce)	
	Release (at nominal voltage)		Max. 5 ms (without bounce)	
Insulation	Resistance (initial)		Min. 100MΩ at 500VDC	
	Dielectric withstanding voltage	Open contacts	500VAC , 1 min.	
		Between coil and contacts	500VAC, 1 min.	
Other	Vibration resistance	Misoperation	10 to 200Hz, 44m/s² (4.5G), constant acceleration	
		Endurance	10 to 200Hz, 44m/s² (4.5G), constant acceleration	
	Shock	Misoperation	100m/s² minimum (11+/-1ms)	
		Endurance	1,000m/s² minimum (6+/-1ms)	
	Weight		Approximately 3.5 g	
	Sealing		Plastic sealed cat III	

* 1 Need to consider the heat to PCB when max. current is more than 10A
* 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.

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.

■ COIL RATING

Standard type

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

Reflow capable type

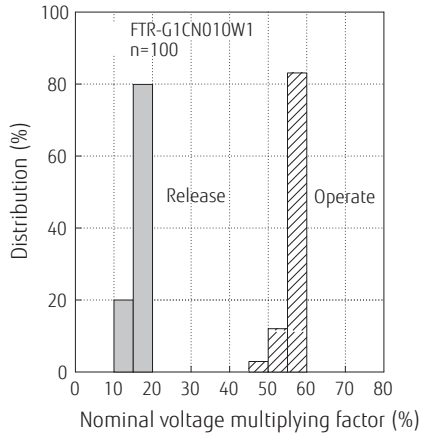
Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *
009	9	126	5.4	0.7
			6.8 (at 85 °C)	0.9 (at 85 °C)
			7.6 (at 125 °C)	1.0 (at 125 °C)
010	10	160	6.5	0.8
			8.2 (at 85 °C)	1.0 (at 85 °C)
			9.2 (at 125 °C)	1.1 (at 125 °C)
012	12	225	7.3	1.0
			9.2 (at 85 °C)	1.3 (at 85 °C)
			10.3(at125 °C)	1.4 (at 125 °C)

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

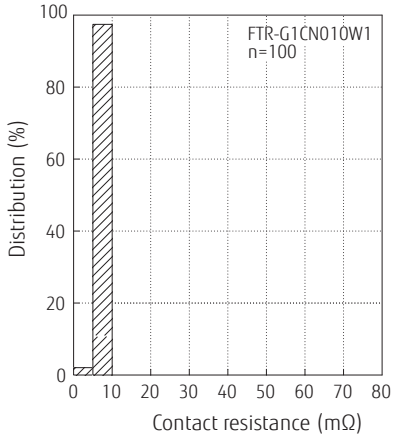
■ CHARACTERISTIC DATA

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

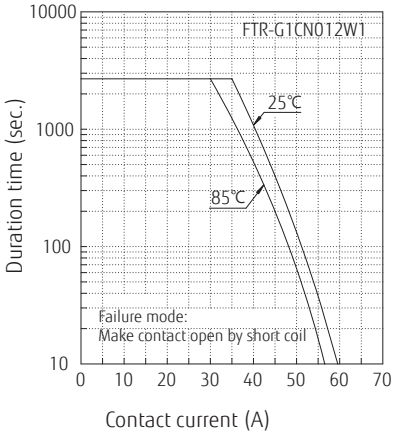
Distribution of operate/release voltage



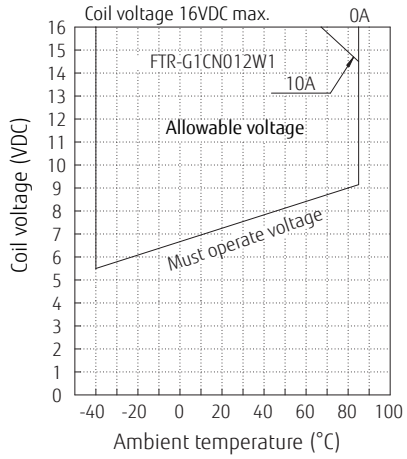
Distribution of contact resistance



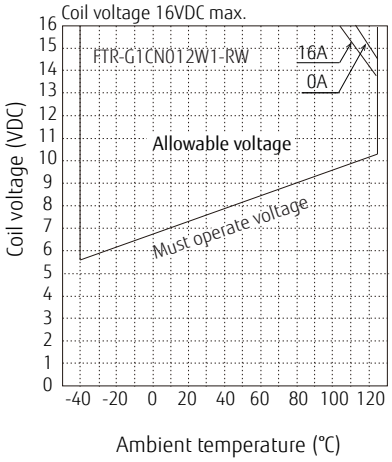
Contact current



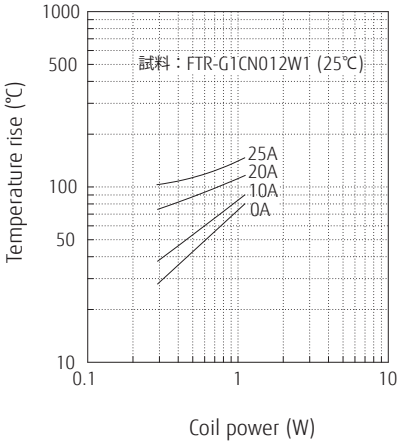
Ambient temperature vs voltage (standard type)



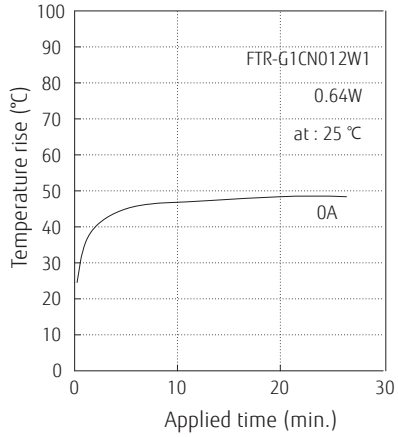
Ambient temperature vs voltage (reflow capable type)



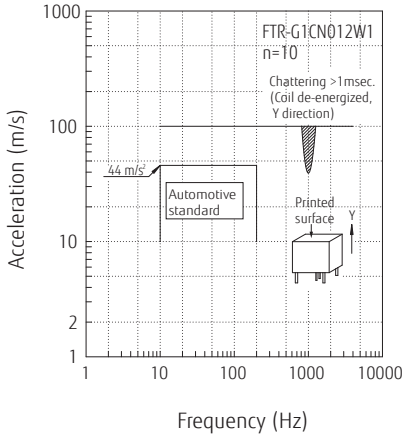
Coil temperature rise



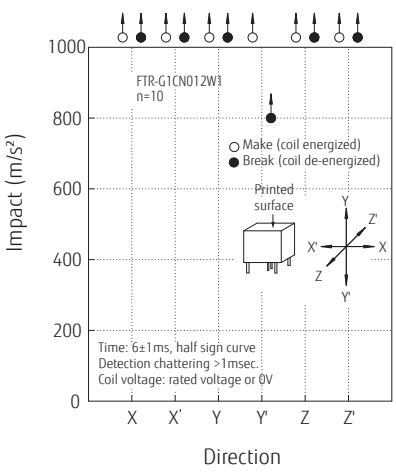
Coil temperature rise



Vibration resistance

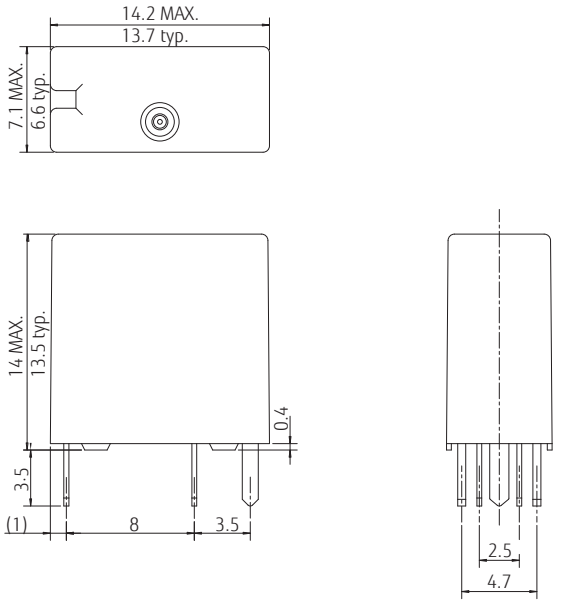


Shock resistance

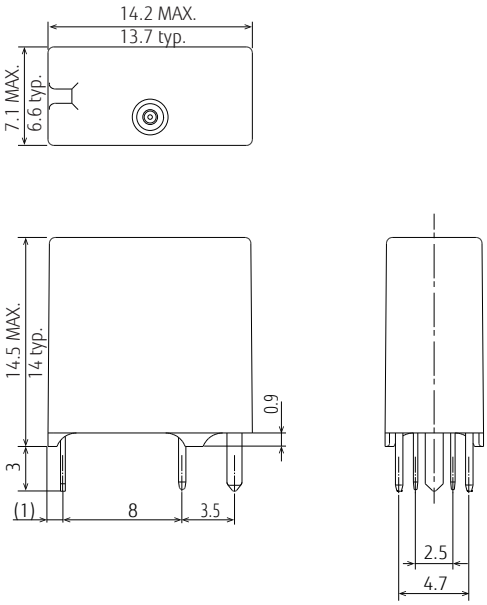


■ DIMENSIONS

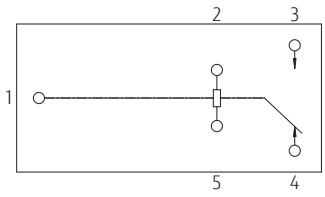
● **Dimensions**
(Standard type)



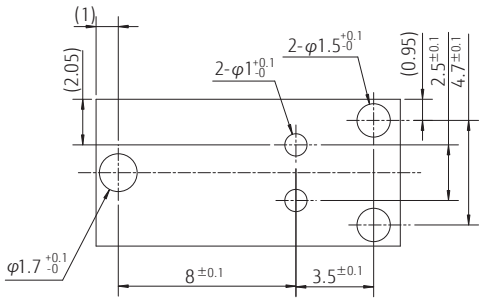
● **Dimensions**
(Reflow capable type)



● **Schematics**
(BOTTOM VIEW)



● **PC board mounting hole layout**
(BOTTOM VIEW)



* Dimensions of the terminals do not include thickness of pre-solder.
* Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.
* Dimensions do not include tolerances. Please ask specification in case you need tolerances.

(1) : Reference
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 standard 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.

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:

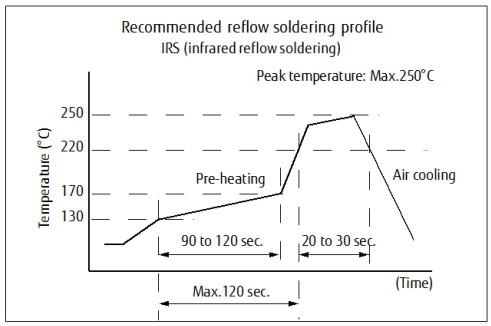
Pre-heating:	maximum 120˚C within 90 sec.
Soldering:	dip within 5 sec. at 255˚C ± 5˚C solder bath

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.

Re-Flow Solder Condition:



Applicable for FTR-G1CNxxx-W1-RW only

Important Notes for Reflow Soldering

- Temperature shall be measured at PC board upper 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 confirmation test with your actual PC boards.
- This reflow solder condition is applicable only for reflow-capable relays. Do not reflow reflow-incapable relays.
- Recommended solder for assembly: Sn-3.0 Ag-0.5 Cu.

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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