

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 achieved 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 C N 010 W1 - RW

 (a) (b) (c) (d) (e) (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 | : Standard (Flow soldering) |
| | | RW | : Reflow capable (THR) |

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

FTR-G1 SERIES

■ 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/s ² (4.5G), constant acceleration | |
| | | Endurance | 10 to 200Hz, 44m/s ² (4.5G), constant acceleration | |
| | Shock | Misoperation | 100m/s ² minimum (11+/-1ms) | |
| | | Endurance | 1,000m/s ² 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 |
| | | | 7.6 (at 125 °C) | 1.1 (at 125 °C) |
| 010 | 10 | 160 | 6.5 | 0.8 |
| | | | 9.2 (at 125 °C) | 1.0 (at 125 °C) |
| 012 | 12 | 225 | 7.3 | 1.0 |
| | | | 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.

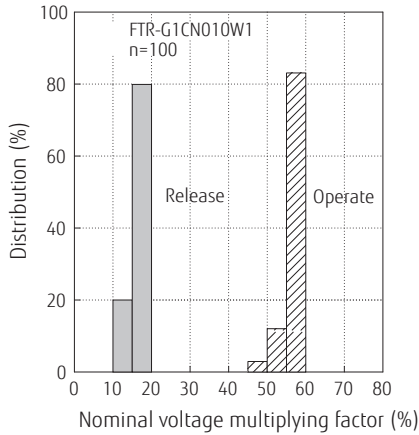
* Specified operate values are valid for pulse wave voltage.

FTR-G1 SERIES

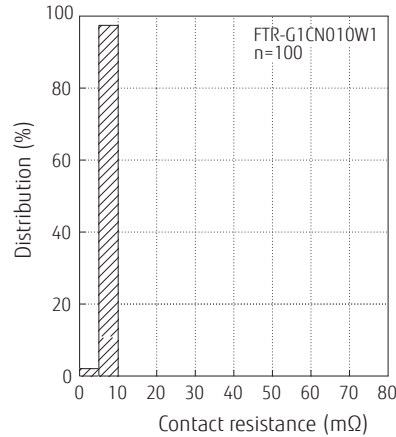
CHARACTERISTIC DATA

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

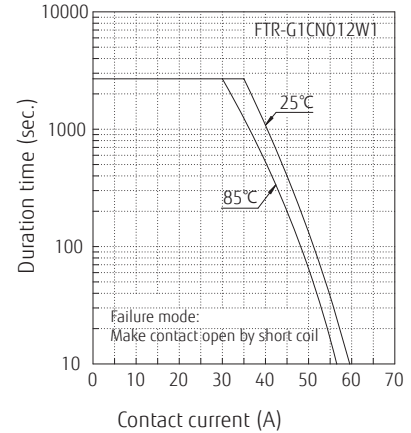
Distribution of operate/release voltage



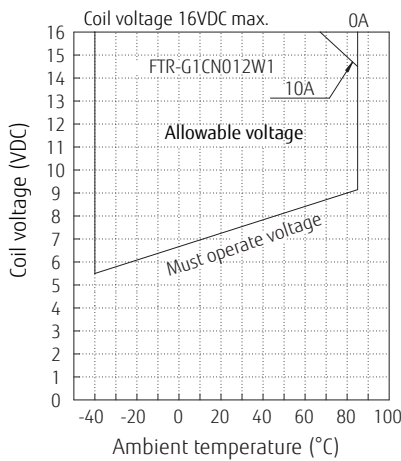
Distribution of contact resistance



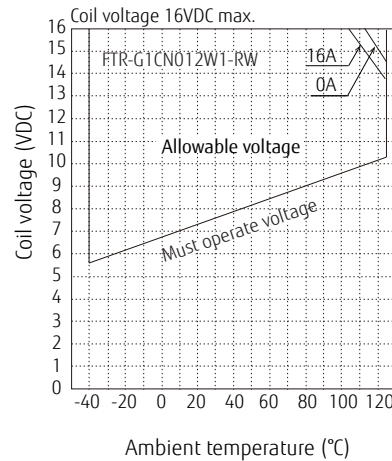
Contact current



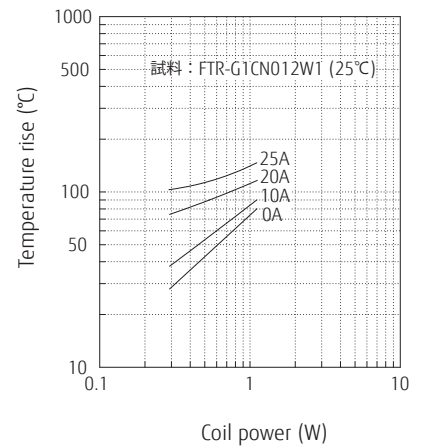
Ambient temperature vs voltage (standard type)



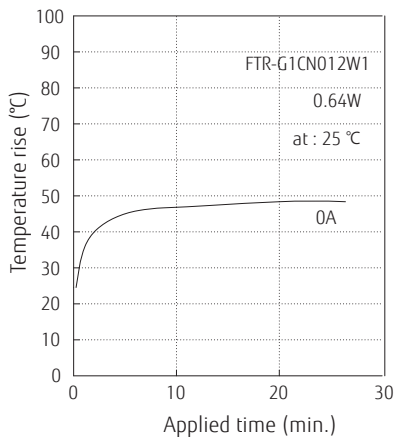
Ambient temperature vs voltage (reflow capable type)



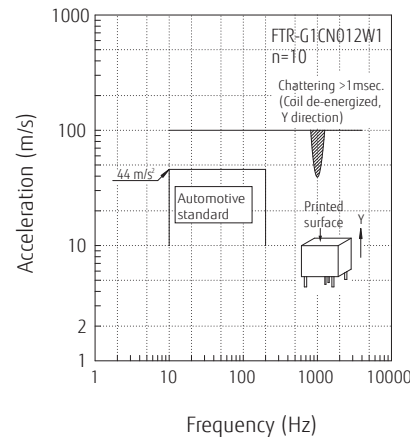
Coil temperature rise



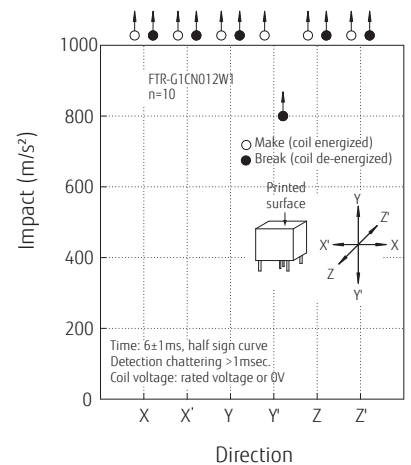
Coil temperature rise



Vibration resistance

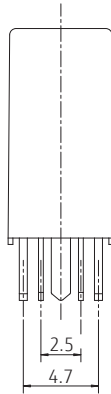
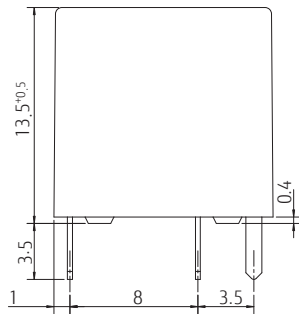
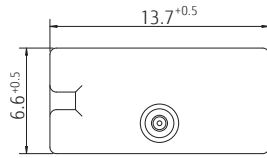


Shock resistance

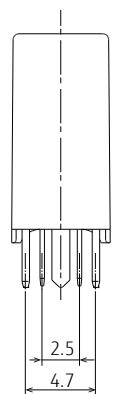
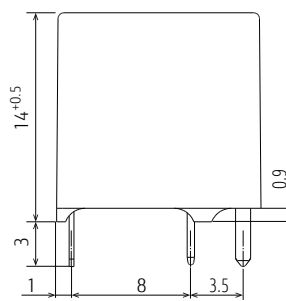
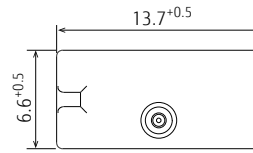


■ DIMENSIONS

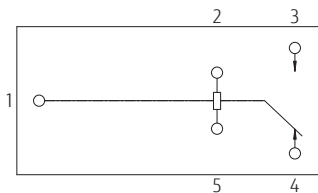
● Dimensions (Standard type)



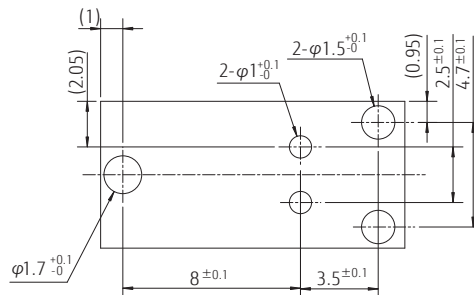
● Dimensions (Reflow capable type)



● 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.

() : 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.

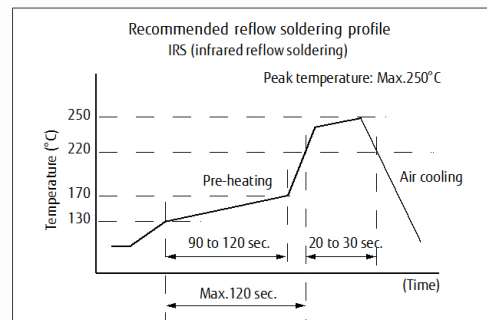
Flow Solder Condition:

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 30-60W
Temperature: maximum 350-360°C
Duration: maximum 3 sec.

Re-Flow Solder Condition:



Applicable for FTR-G1CNxxx-W1-RW only

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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|--|--|--|
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