

# 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 (57dB average at 5cm)
  - RoHS compliant
- Please see page 5 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  
                   (a)    (b)    (c)    (d)    (e)

|     |                       |                       |                                            |
|-----|-----------------------|-----------------------|--------------------------------------------|
| (a) | Relay type            | FTR-G1: FTR-G1 Series |                                            |
| (b) | Contact configuration | C                     | : 1 form C                                 |
| (c) | Contact gap           | N                     | : 0.25mm                                   |
| (d) | Coil rated voltage    | 010                   | : 9...12VDC<br>Coil rating table at page 3 |
| (e) | Contact material      | W1                    | : Silver-tin oxide indium                  |

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                               |                                                                                                                                                                                                              |                                      |
|--------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Contact Data | Configuration                        | 1 form C                                                                                                                                                                                                     |                                      |
|              | Material                             | Silver-tin oxide indium (AgSnO <sub>2</sub> )                                                                                                                                                                |                                      |
|              | Contact voltage drop                 | Max. 100mV at 1A, 6VDC (after stabilization)                                                                                                                                                                 |                                      |
|              | Contact rating                       | 25A at 14VDC (locked motor load)                                                                                                                                                                             |                                      |
|              | Max. carrying current * <sup>1</sup> | 25A/1 hour (25 °C, 100% rated coil voltage)                                                                                                                                                                  |                                      |
|              | Max. switching voltage               | 16VDC (reference)                                                                                                                                                                                            |                                      |
|              | Max. switching current               | 35A (reference)                                                                                                                                                                                              |                                      |
|              | Min. switching load * <sup>2</sup>   | 1A, 6VDC                                                                                                                                                                                                     |                                      |
| Life         | Mechanical                           | Min. 1 x 10 <sup>6</sup> operations                                                                                                                                                                          |                                      |
|              | Electrical                           | * Min. 100 x 10 <sup>3</sup> operations,<br>14VDC, 25A inrush power window motor<br>(1 operation: 1 forward and 1 reverse)<br>* Min. 100 x 10 <sup>3</sup> operations<br>14VDC, 20A inrush door locked motor |                                      |
| Coil Data    | Rated power                          | 640mW                                                                                                                                                                                                        |                                      |
|              | Operate power                        | 237mW                                                                                                                                                                                                        |                                      |
|              | Operating temperature range          | -40 °C to +85 °C (no frost)                                                                                                                                                                                  |                                      |
| Timing Data  | Operate (at nominal voltage)         | Max. 10 ms (without bounce)                                                                                                                                                                                  |                                      |
|              | Release (at nominal voltage)         | Max. 5 ms (without bounce, no diode)                                                                                                                                                                         |                                      |
| 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 55Hz double amplitude 1.5mm    |
|              | Shock                                | Misoperation                                                                                                                                                                                                 | 100m/s <sup>2</sup> minimum (10G)    |
|              |                                      | Endurance                                                                                                                                                                                                    | 1,000m/s <sup>2</sup> minimum (100G) |
|              | 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.

# FTR-G1 SERIES

## ■ COIL RATING

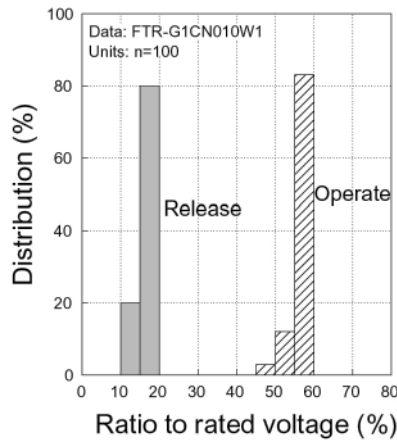
| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) | Must Operate Voltage (VDC) * | Must Release Voltage (VDC) * | Coil Power at Nominal Voltage (W) |
|-----------|--------------------------|-------------------------------|------------------------------|------------------------------|-----------------------------------|
| 009       | 9                        | 126                           | 5.4                          | 0.75                         | 0.64                              |
|           |                          |                               | 6.8 (at 85 °C)               |                              |                                   |
| 010       | 10                       | 160                           | 6.5                          | 0.8                          |                                   |
|           |                          |                               | 8.2 (at 85 °C)               |                              |                                   |
| 012       | 12                       | 225                           | 7.3                          | 1                            |                                   |
|           |                          |                               | 9.2 (at 85 °C)               |                              |                                   |

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

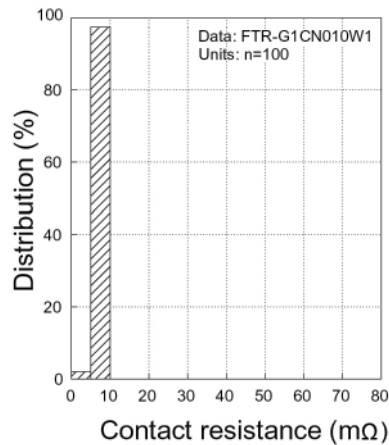
\* Specified operate values are valid for pulse wave voltage.

## ■ REFERENCE DATA

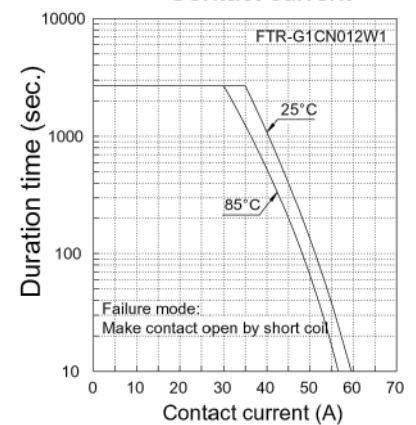
Operate/release voltage distribution



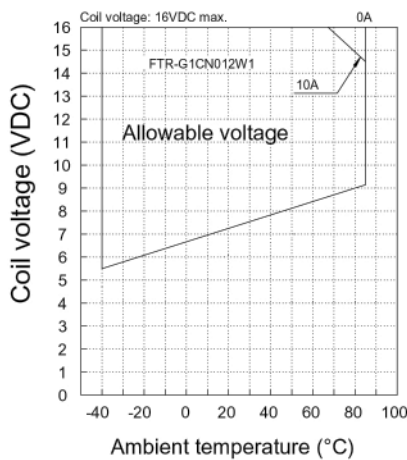
Contact resistance distribution



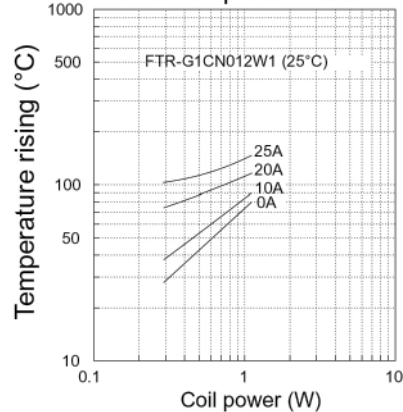
Contact current



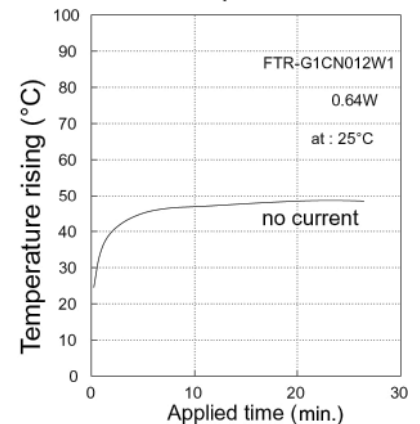
Ambient temperature vs voltage



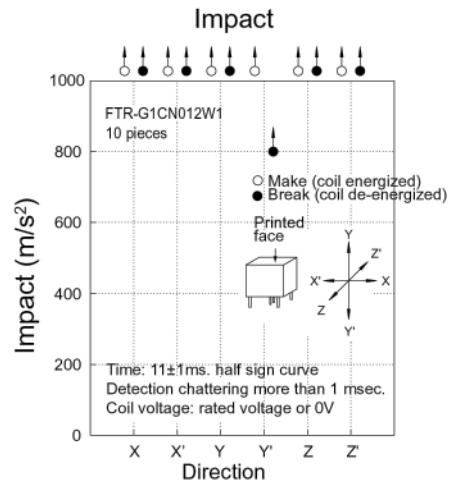
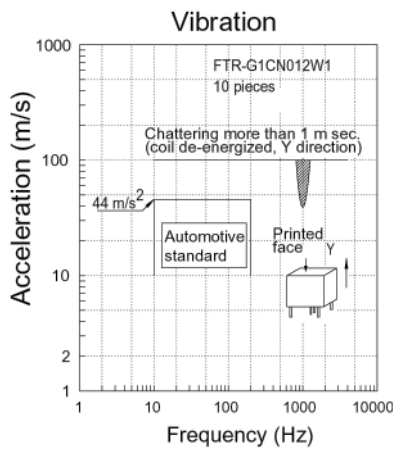
Coil temperature rise



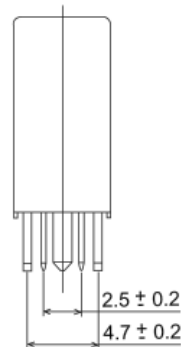
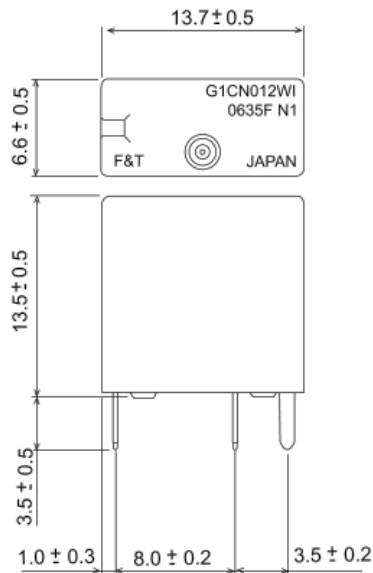
Coil temperature rise



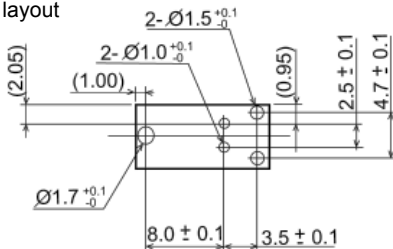
# FTR-G1 SERIES



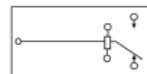
## DIMENSIONS



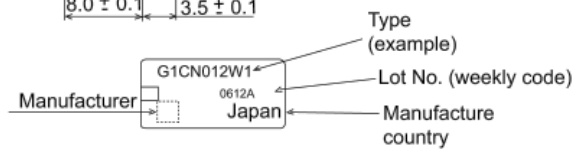
- Mounting hole layout  
(bottom view)



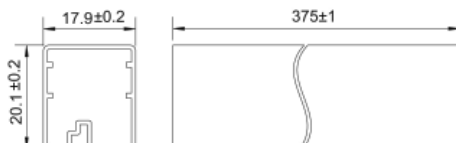
- Schematics



- Marking (example)



- Tube



Unit: mm

## RoHS Compliance and Lead Free Information

### 1. General Information

- All automotive relays produced by Fujitsu Components are compliant with RoHS directive 2002/95/EC including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives on October 21st, 2005. (Amendment to Directive 2002/95/EC)
- All our automotive relays are lead-free.
- 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 Profile

- Recommended solder Sn-3.0Ag-0.5Cu.

**Flow Solder condition:**

Pre-heating: maximum 120°C  
Soldering: dip within 5 sec. at  
260°C solder bath

**Solder by Soldering Iron:**

Soldering Iron  
Temperature: maximum 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 through hole mounted 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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