Compact Power Relay

1 Pole—25A for Automotive Applications

FTR-G1 Series

RoHS compliant

■ FEATURES

- Compact for high density packaging (70% volumne of previous generation FTR-P3 series)
- High contact capacity with proven contact material (min. 100,000 operations, 14V, 25A achived, even with reduced size)
- 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 (57dB average at 5cm)
- RoHS compliant since begining of production.
  Please see page 7 for more information

■ ORDERING INFORMATION

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

(a)	Series Name	FTR-G1: FTR-G1 Series
(b)	Contact Arrangement	C : 1Form C
(c)	Contact Gap	N : 0.3mm gap
(d)	Nominal Coil Voltage	009 : 09 VDC 010 : 010 VDC 012 : 012 VDC
(e)	Contact Material	W1 : Silver-tin oxide-indium
(f)	Custom Designation	To be assigned custom designation

Note: The designation name is stamped on the top of the relay case as follows:
Example: Ordering part number: FTR-G1CN010W1
Stamped on part number: G1CN010W1

■ TYPICAL APPLICATIONS

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

■ SPECIFICATIONS

Item			FTR-G1
Contact	Arrangement		1 form C
	Material		Silver-tin oxide-indium
	Contact Path Voltage Drop (initial)		Maximum 100 mΩ (at 6 VDC 1A after stabilization)
	Rating		25 A at 14VDC (locked motor load)
	Maximum Carry Current*1		25 A / 1 hour (25°C, 100% rated coil voltage)
	Maximum Switching Current (reference)		35A, 16VDC
	Minimum load (reference)*2		1A, 6VDC
Coil	Rated coil power (20°C)		640 mW
	Operate coil power (20°C)		237 mW
	Operating Ambient Temperature Range		–40°C to +85°C (no frost)
Time Values	Operate (at nominal voltage)		Maximum 10 ms (not including bounce)
	Release (at nominal voltage)		Maximum 5 ms (not including bounce, no diode)
Life	Mechanical		$1x10^6$ operations minimum
	Electrical		1) $100x10^3$ operation minimum, 14VDC, 25A inrush power window motor (1 operation: 1 forward and 1 reverse) 2) $100x10^3$ ops. min. 14VDC, 20A inrush door locked motor
Other	Vibration Resistance	Misoperation	10-55HZ, 1.5mm double amplitude
	Shock Resistance	Misoperation	100 m/s^2 minimum (10G)
		Endurance	1,000 m/s^2 mimimum (100G)
	Insulation Resistance (initial)		Max. 100 MΩ @500 VDC
	Dielectric Withstanding Voltage (initial)		500 VAC
	Weight		Approximately 3.5g

*1 Need to consider the head from PCB when max. current is more than 10A.
*2 Values when switching a resistive load at normal room temperature and humidity and in a clean environment.
The minimum switching load varies with the switching frequency and operating environment.

■ COIL DATA CHART

FTR-G1 Series

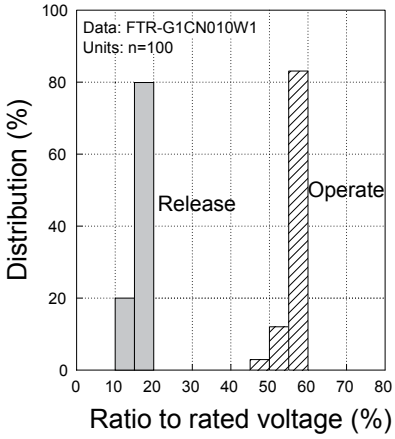
Model	Nominal Coil Voltage	Coil Resistance (±10% at 20°C)	Must Operate Voltage	Must Release Voltage (at 20°C)	Coil Power at Nominal Voltage
FTR-G1CN009W1	9VDC	126	5.4VDC (at 85°C) 6.8VDC (at 85°C)	0.75VDC	0.64W
FTR-G1CN010W1	10VDC	160	6.5VDC (at 85°C) 8.2VDC (at 85°C)	0.8VDC	0.64W
FTR-G1CN012W1	12VDC	225	7.3VDC (at 85°C) 9.2VDC (at 85°C)	1.0VDC	0.64W

■ INSULATION

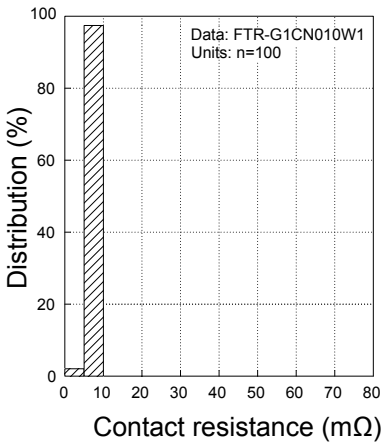
Item		Specification
Resistance		Minimum 100 MΩ 1 min.
Dielectric Strength	open contacts	500 VAC (50/60 Hz) 1 min.
	coil and contacts	500 VAC (50/60 Hz) 1 min.

■ REFERENCE DATA

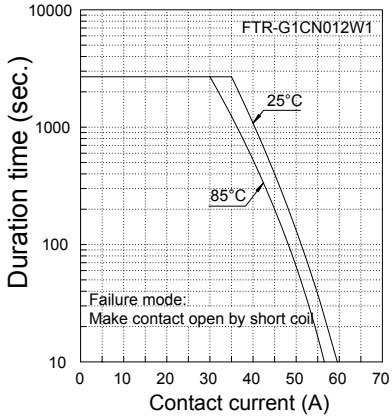
Operate/release voltage distribution



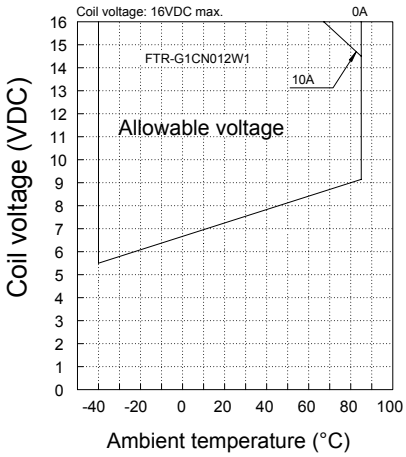
Contact resistance distribution



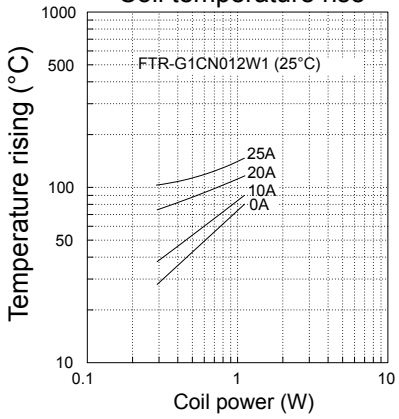
Contact current



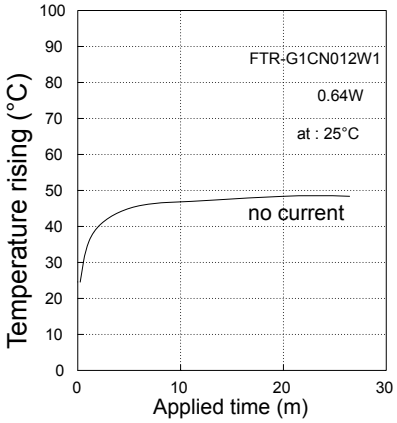
Ambient temperature vs voltage



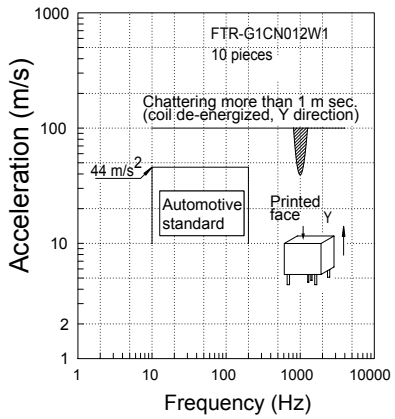
Coil temperature rise



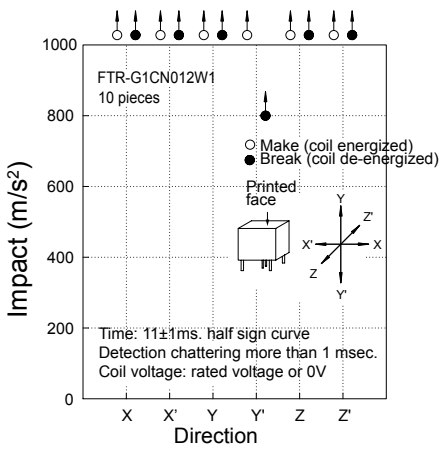
Coil temperature rise



Vibration

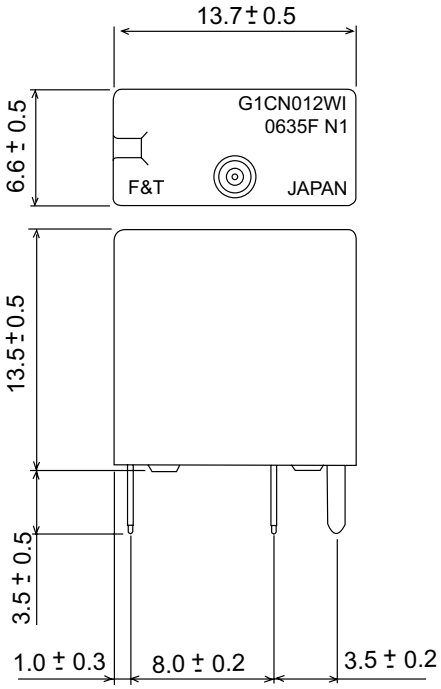


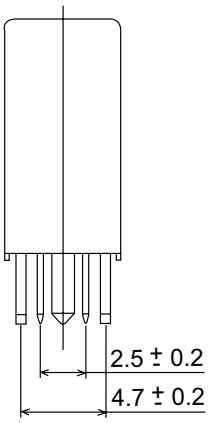
Impact



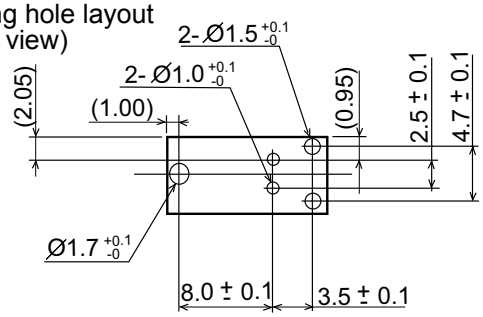
■ DIMENSIONS

Schematic

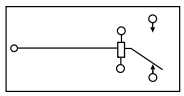




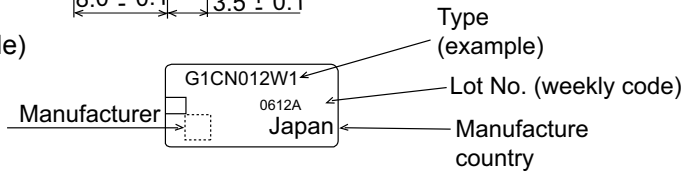
Mounting hole layout
(bottom view)



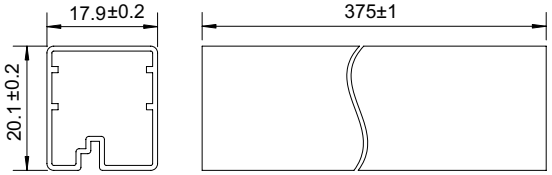
Schematic



Marking (example)



Tube



Unit: mm

RoHS Compliance and Lead Free Relay Information

1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu.

Flow Solder condition:

Pre-heating:	maximum 120˚C
Soldering:	dip within 5 sec. at 260˚C soler 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 electromechanical realys.

4. Tin Whisker

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

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