

# SILENT TWIN RELAY

for automotive applications

1 POLE x 2 - 25A (for 12V car battery)

## FTR-P2 Series

### ■ FEATURES

- Low operating sound  
An original silent mechanism decreases the propagation of operating sound when mounted on a PCB.  
(Average sound pressure: 50dB at 5 cm)
- Compact, high density package  
350 mm<sup>2</sup> mounting area
- High sensitivity, low power consumption  
(nominal power consumption: 450 mW)
- Simple PCB layout due to internal H-Bridge connections typically used in motor applications.  
All terminals are on the perimeter
- High breaking capability.
- Typical applications  
Power window, Doorlock, Power seat, Wiper (for H-Bridge circuit)
- RoHS compliant  
Please see page 7 for more information



### ■ PARTNUMBER INFORMATION

[Example]      FTR-P2      C      N      012      W1  
                    (a)        (b)        (c)        (d)        (e)

(a)	Relay type	FTR-P2 : FTR-P2 Series
(b)	Contact configuration	C : 1 form C x 2, H-bridge
(c)	Contact gap	N : 0.3mm gap
(d)	Coil rated voltage	012 : 9.....12VDC Coil rating table at page 2
(e)	Contact material	W1 : Silver-tin oxide indium

Actual marking does not carry the type name: "FTR"  
E.g.: Ordering code: FTR-P2CN012W1 Actual marking: P2CN012W1

## ■ SPECIFICATION

Item	FTR-P2		
Contact Data	Configuration		1 form C x 2, H-Bridge
	Material		Silver-tin oxide indium
	Voltage drop		Max. 100mV at 1A, 12VDC
	Contact rating		14VDC, 25A (motor locked)
	Max. carrying current		25A/1 hour (25 °C, nominal voltage applied to coil)
	Max. switching voltage		16VDC (reference)
	Max. switching current		35A (reference)
	Min. switching load *		6V, 1A (reference)
Life	Mechanical		Min. 10 million operations
	Electrical		Min. 100k operations (at contact rating)
Coil Data	Operating temperature range		-40 °C to +85 °C (no frost)
	Storage temperature range		-40 °C to +100 °C (no frost)
Timing Data	Operate (at nominal voltage)		Max. 10 ms
	Release (at nominal voltage)		Max. 5 ms (without diode), Max. 15ms (with diode)
Other	Vibration resistance (operational)	Misoperation	10 to 200Hz, acceleration 44m/s <sup>2</sup> (4.5G), constant acceleration
		Endurance	10 to 200Hz, acceleration 44m/s <sup>2</sup> (4.5G), constant acceleration
	Shock	Misoperation	100 m/s <sup>2</sup> (11±1ms)
		Endurance	1,000 m/s <sup>2</sup> (6±1ms)
	Weight		Approximately 13 g
	Average sound pressure		Approximately 50dB at 5cm

\* 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.

## ■ COIL RATING

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (V) *	Must Release Voltage (V) *
009	9	180	5.5 (at 20 °C)	0.7 (at 20 °C)
			6.9 (at 85 °C)	0.9 (at 85 °C)
010	10	220	6.3 (at 20 °C)	0.8 (at 20 °C)
			7.9 (at 85 °C)	1.0 (at 85 °C)
012	12	320	7.3 (at 20 °C)	1.0 (at 20 °C)
			9.2 (at 85 °C)	1.3 (at 85 °C)

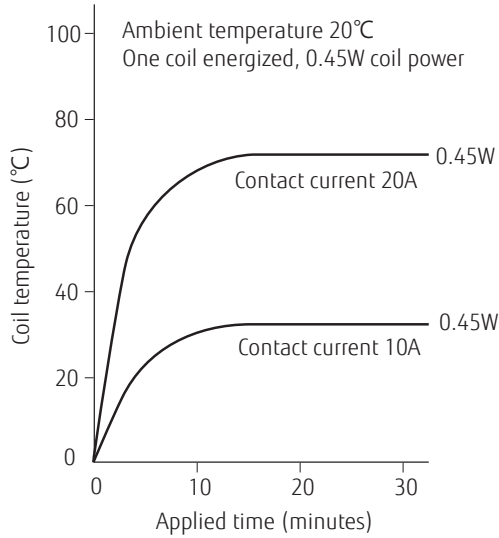
Note: All values in the table are valid for 20°C and zero contact current, unless otherwise stated.

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

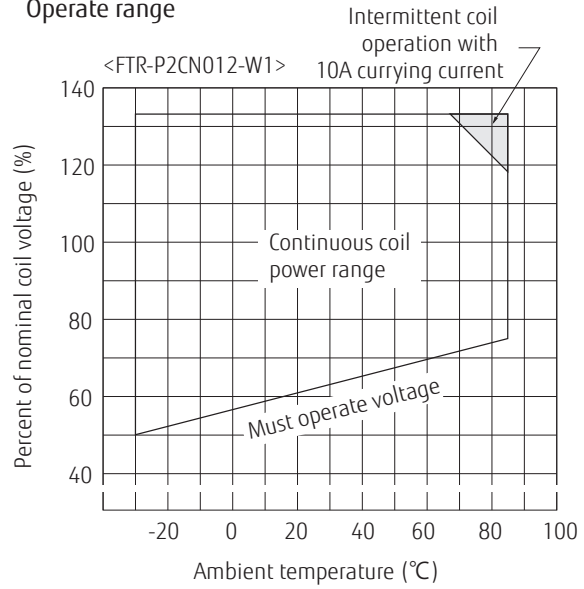
## ■ CHARACTERISTIC DATA

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

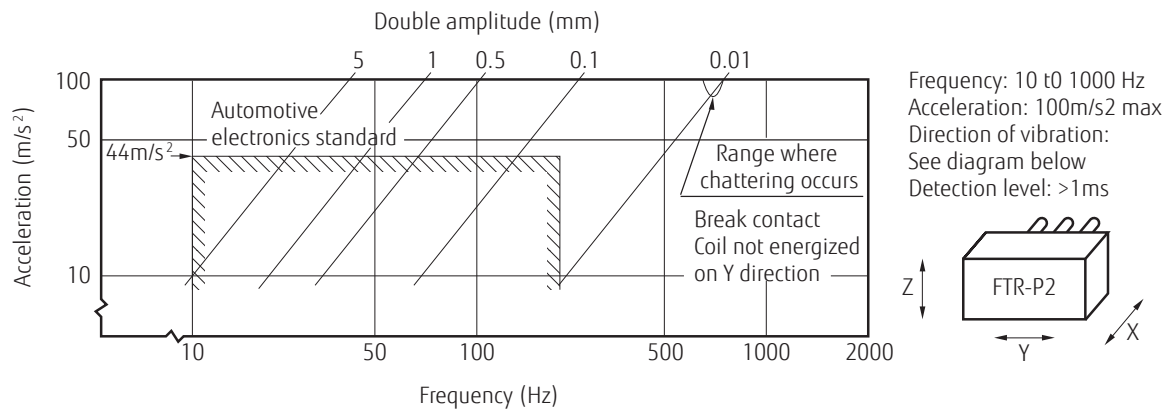
### Coil temperature rise



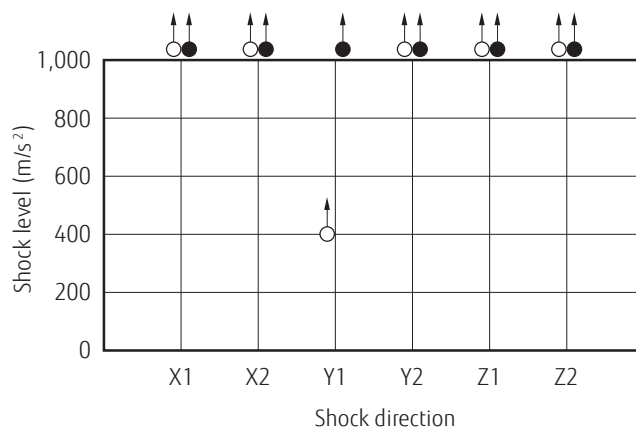
### Operate range



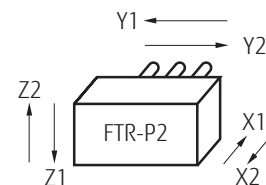
### Vibration resistance characteristics



### Shock resistance characteristics



Shock application time: 6±1ms, half -sine wave  
Test conditions: coil energized and de-energized  
Shock direction: See diagram below  
Detection level: >1ms

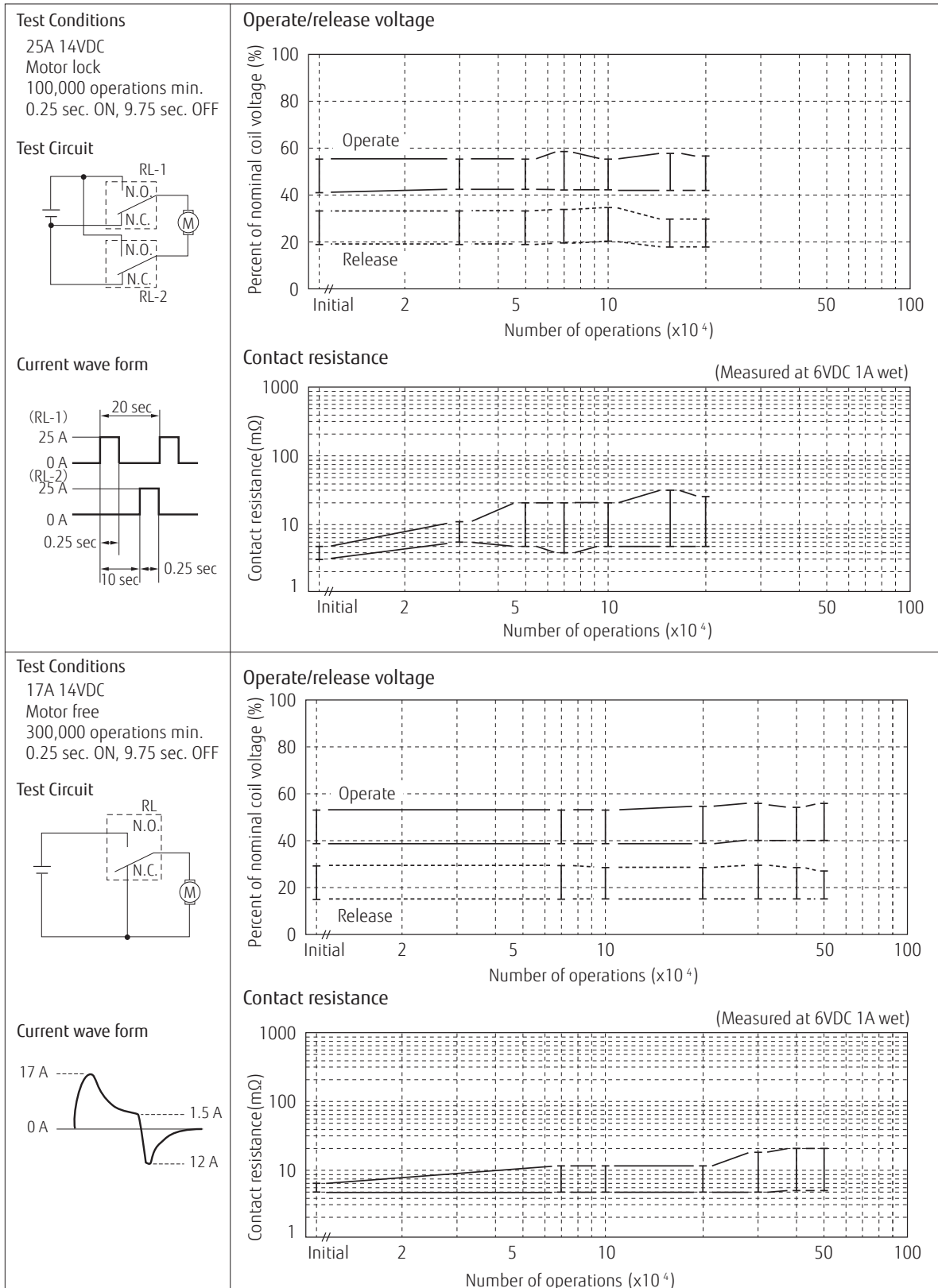


○ : Break contact (coil de-energized)  
● : Make contact (coil energized)

## ■ CHARACTERISTIC DATA

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

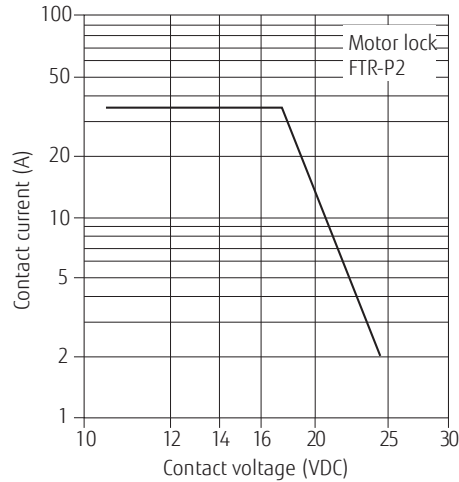
### Life test (example)



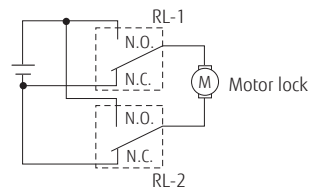
## ■ CHARACTERISTIC DATA

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

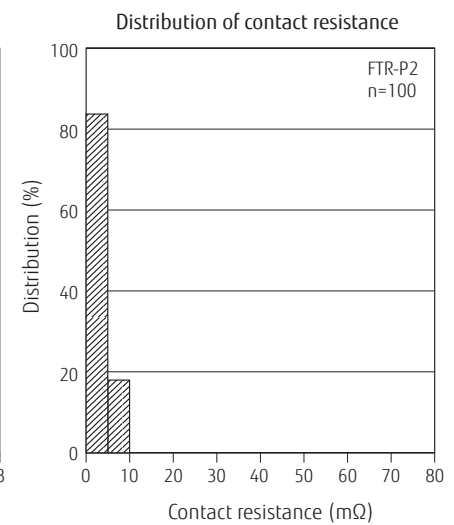
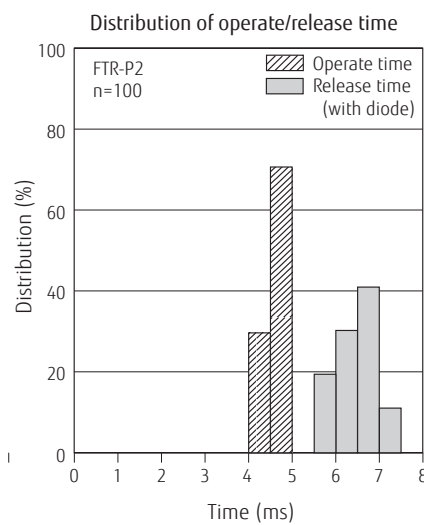
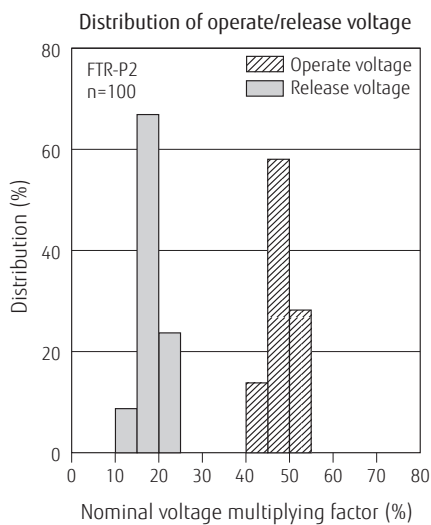
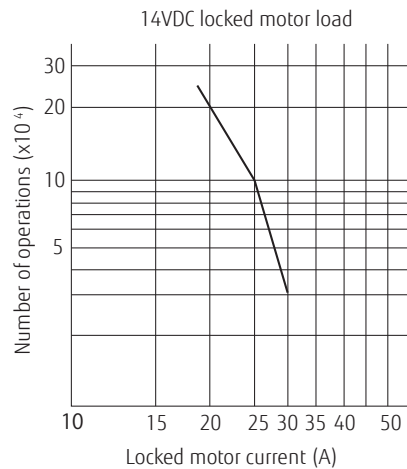
### Maximum break capacity



Test circuit

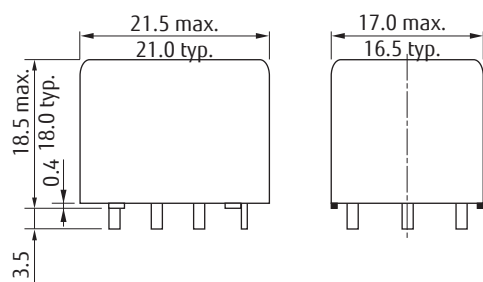


### Life curve

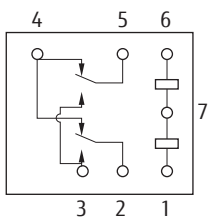


■ DIMENSIONS

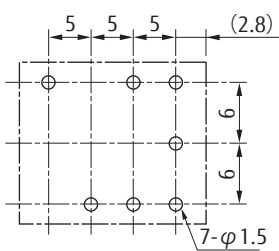
● Dimensions



● 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.

**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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