

# MINIATURE LOW NOISE RELAY

## 1 POLE - 25A (For 12V car battery)

### FTR-P7 Series

#### ■ FEATURES

- Miniature size, 1 form C
- Low noise (average acoustic noise level: 45dB, distance 5cm)
- High contact capacity (25A, 1 hour)
- Application examples:  
Wiper, Seat heater
- RoHS compliant  
Please see page 5 for more information



#### ■ PARTNUMBER INFORMATION

[Example]     FTR-P7    C    N    012    W1    \*\*  
                   (a)    (b)    (c)    (d)    (e)    (f)

(a)	Relay type	FTR-P7 : FTR-P7 Series
(b)	Contact configuration	C : 1 form C
(c)	Sealing	N : Plastic sealed type
(d)	Coil rated voltage	012 : 12VDC
(e)	Contact material	W1 : Silver-tin oxide alloy
(f)	Special type	To be assigned custom specification

Actual marking does not carry the type name: "FTR"  
 E.g.: Ordering code: FTR-P7CN012W1 Actual marking: P7CN012W1

# FTR-P7 SERIES

## ■ SPECIFICATION

Item	FTR-P7		
Contact Data	Configuration	1 form C	
	Material	Silver-tin oxide alloy	
	Voltage drop (resistance)	Max. 100mV at 1A, 12VDC	
	Contact rating	25A, 14VDC (motor locked)	
	Max. carrying current	25A / 1 hour (25 °C, nominal voltage applied to coil)	
	Max. inrush current	35A	
	Min. switching load (reference) *	1A, 6VDC	
Life	Mechanical	Min. $1 \times 10^6$ operations (with load for contact)	
	Electrical	Min. $100 \times 10^3$ operations (14VDC, 25A locked motor)	
Coil Data	Coil power consumption	Approximately 0.55W (at rated coil voltage)	
	Operating temperature range	-40 °C to +85 °C (no frost)	
	Storage temperature range	-40 °C to +105 °C (no frost)	
Timing Data	Operate (at nominal voltage)	Max. 10 ms (without bounce)	
	Release (at nominal voltage)	Max. 5 ms (without bounce)	
Insulation	Initial resistance	Min. 100MΩ, 500VDC	
	Dielectric withstanding voltage	500VAC, 1min.	
Other	Vibration resistance	Misoperation	10 to 100Hz 43m/s <sup>2</sup> (4.5G), constant acceleration **
		Endurance	10 to 100Hz 43m/s <sup>2</sup> (4.5G), constant acceleration **
	Shock	Operational	98m/s <sup>2</sup> (11±1ms)
		No damage	980m/s <sup>2</sup> (6±1ms)
	Noise level		Average 45dB (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.

\*\* Double amplitude 1.5mm maximum , acceleration 44m/s maximum at each frequency level.

## ■ 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)
012	12	260	7.7 (at 20 °C)	0.9 (at 20 °C)	0.55

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.

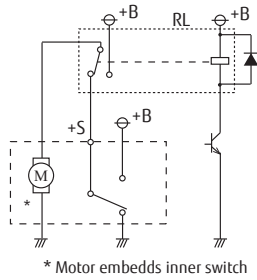
Note: Please apply rated coil voltage. In case of applying different coil voltage, please refer to reference data "operating coil voltage range" and apply adequate coil voltage.

## CHARACTERISTIC DATA (reference)

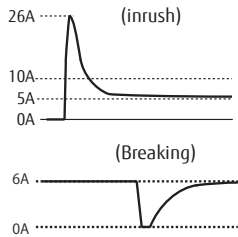
### Life test (example)

- Test condition
  - 25A 14VDC
  - Wiper motor free load (motor off)
  - 500,000 operations min.
  - 0.5 seconds ON, 3.5 seconds OFF

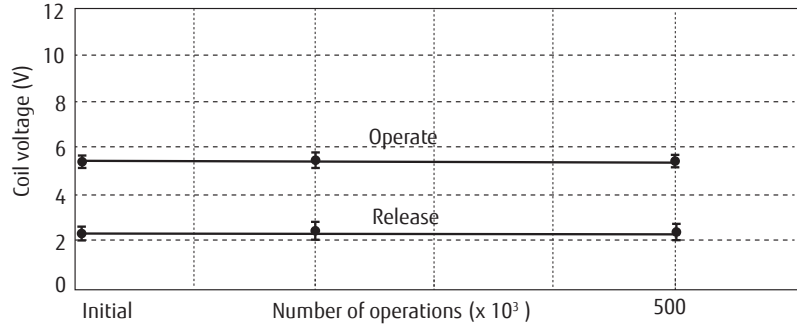
### • Test circuit



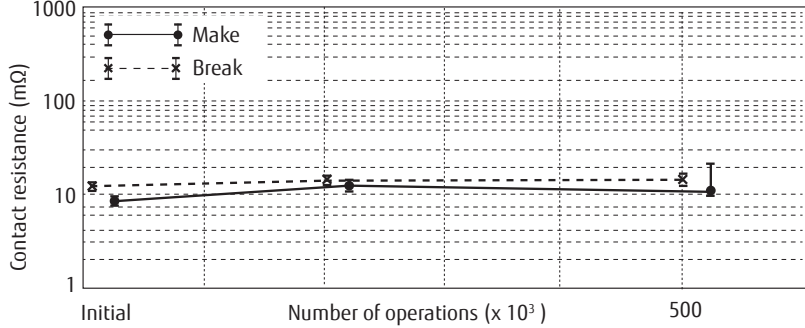
### • Current wave form



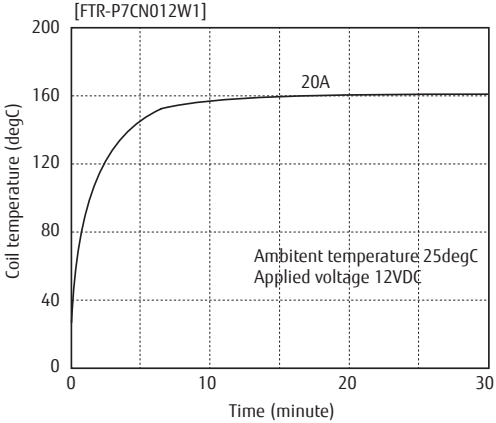
Operate / release voltage



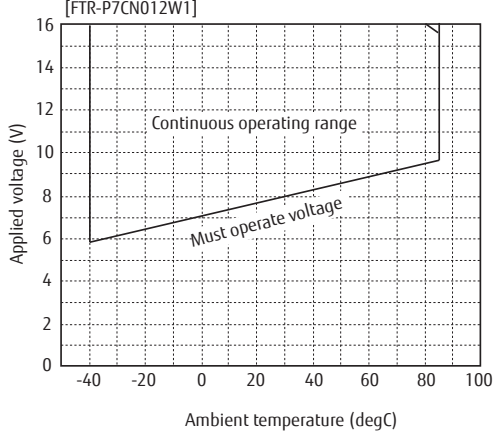
(Measured at DC 6V, 1A wet)



Coil temperature rise

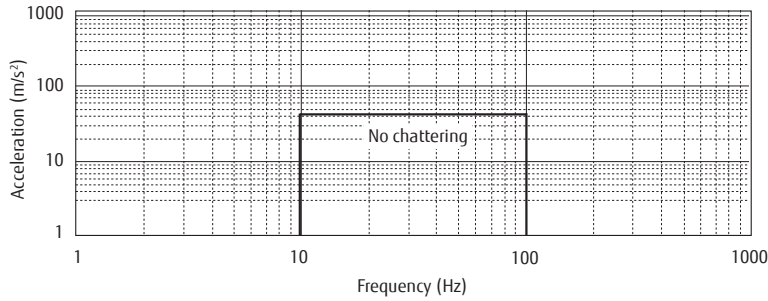


Operating coil voltage range

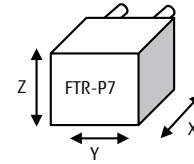


# FTR-P7 SERIES

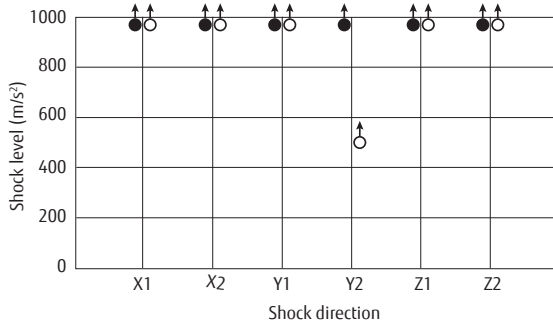
## Vibration resistance characteristics



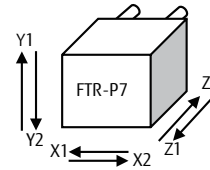
Frequency: 10 to 100Hz  
 Acceleration:  $44.1m/s^2$  max.  
 Direction of vibrator: see diagram below  
 Detection level: chatter >1ms



## Shock resistance characteristics



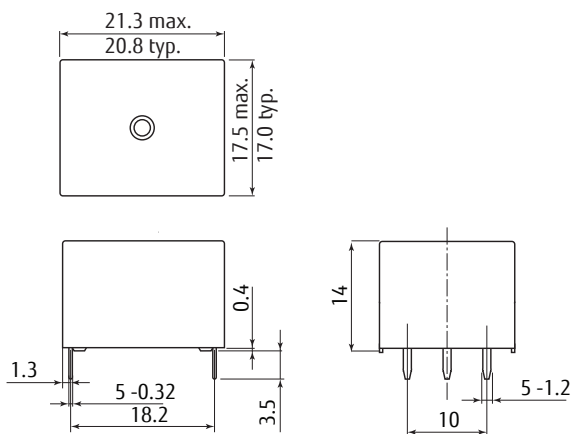
Shock application time:  $6\pm 1ms$ , half-sine wave  
 Test conditions: coil energized and de energized  
 Shock direction: see diagram below  
 Detection level: chatter >1ms



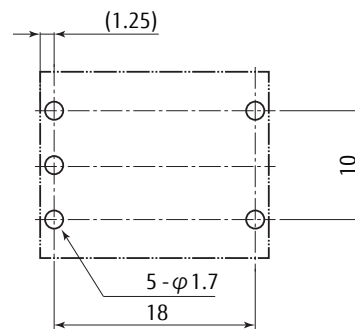
○ : Break contact (coil de-energized)  
 ● : Make contact (coil energized)

## ■ DIMENSIONS

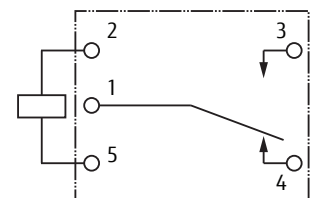
### ● Dimensions



### ● 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 :  $\pm 0.1$  unless otherwise specified.
- \* Dimensions do not include tolerances. Please ask specification in case you need tolerances.

( ) : 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.
- Please connect relay coils according to specified polarity.

## 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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