

COMPACT POWER RELAY

For automotive applications

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

FTR-P3 Series (Reflowable)

■ FEATURES

- Compact for high density packaging
 - 1 pole 25A, 1 form A / 1 form C
 - Coil power savings (600mW nominal achieved with state-of-the-art magnetic design)
 - Ease of PCB layout (all terminals on perimeter, coil and contact terminals separated)
 - Reflowable & high stand-off type
 - Optional over-voltage circuit breaking capability (0.6mm gap, contact our representative)
 - Packaging for auto-insertion (tube packing, 30 relays/tube)
 - Application examples: power window, power seat, tilt steering, sunroof, wiper, retractable antenna, etc.
 - RoHS compliant
- Please see page 7 for more information



■ PARTNUMBER INFORMATION

[Example] FTR-P3 C N 012 W1 - 06
 (a) (b) (c) (d) (e) (f)

(a)	Relay type	FTR-P3	: FTR-P3 Series
(b)	Contact configuration	A C	: 1 form A : 1 form C
(c)	Contact gap	N	: 0.25mm gap
(d)	Coil rated voltage	012	: 9...12VDC Coil rating table at page 3
(e)	Contact material	W1	: Silver-tin oxide indium
(f)	Special type	06	: High Stand-off type (Reflowable type)

Actual marking does not carry the type name: "FTR" and suffix "-06"
 E.g. : Ordering code: FTR-P3CN012-W1-06 Actual marking: P3CN012-W1

FTR-P3 SERIES

■ SPECIFICATION

Item			FTR-P3AN()W1-06	FTR-P3CN()W1-06
Contact Data	Configuration		1 form A (SPST)	1 form C (SPDT)
	Material		Silver-tin oxide indium	
	Contact path voltage drop		Max. 100mV at 1A, 12VDC	
	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		6VDC, 1A (reference)	
Life	Mechanical		Min. 1 x 10 ⁶ operations	
	Electrical		Min. 100 x 10 ³ operations, 14VDC, 25A (locked motor load) (1 operation = 1 forward and 1 reverse)	
Coil Data	Operating ambient temperature range		-40 °C to +125 °C (no frost)	
	Storage temperature range		-40 °C to +125°C (no frost), 45 ~ 85% RH	
Timing Data	Operate (at nominal voltage)		Max. 10 ms (without bounce)	
	Release (at nominal voltage)		Max. 5 ms (without bounce, no diode) Max. 15 ms (without bounce, with diode)	
Insulation	Resistance (initial)		Min. 100M Ω	
	Dielectric withstand- ing voltage (initial)	Between contact	500VAC, 1 minute	
		Between coil and contacts	500VAC, 1 minute	
Other	Vibration resistance	Misoperation	10 to 200Hz, acceleration 43m/s ² (4.4G), constant acceleration	
		Endurance	10 to 200Hz, acceleration 43m/s ² (4.4G), constant acceleration	
	Shock	Misoperation	100m/s ² minimum (11+/-1ms)	
		Endurance	1,000m/s ² minimum (6+/-1ms)	
	Weight		Approximately 5 g	

* 1 Need to consider the heat from 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.

■ COIL RATING

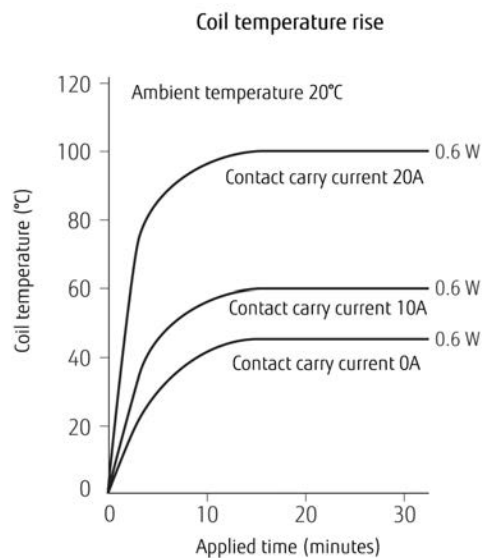
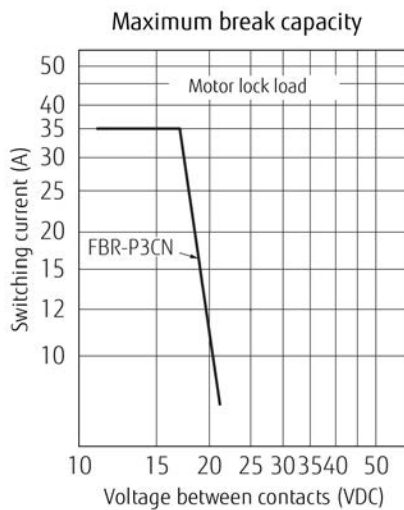
FTR-P3 (Reflowable) (0.25mm contact gap)

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *
009	9	135	5.5 (at 20 °C)	0.7 (at 20 °C)
			7.8 (at 125 °C)	1.0 (at 125 °C)
010	10	167	6.3 (at 20 °C)	0.8 (at 20 °C)
			8.9 (at 125 °C)	1.1 (at 125 °C)
012	12	240	7.3 (at 20 °C)	1.0 (at 20 °C)
			10.3 (at 125 °C)	1.4 (at 125 °C)

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

* Specified operate values are valid for pulse wave voltage.

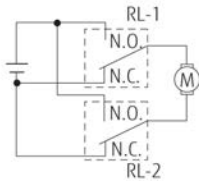
■ CHARACTERISTIC DATA



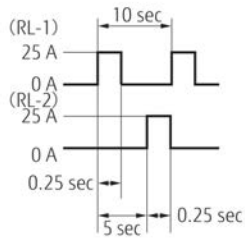
Life test (examples)

Test condition
25A, 14VDC
motor lock
100,000 operations min.
0.25 seconds ON
9.75 seconds OFF

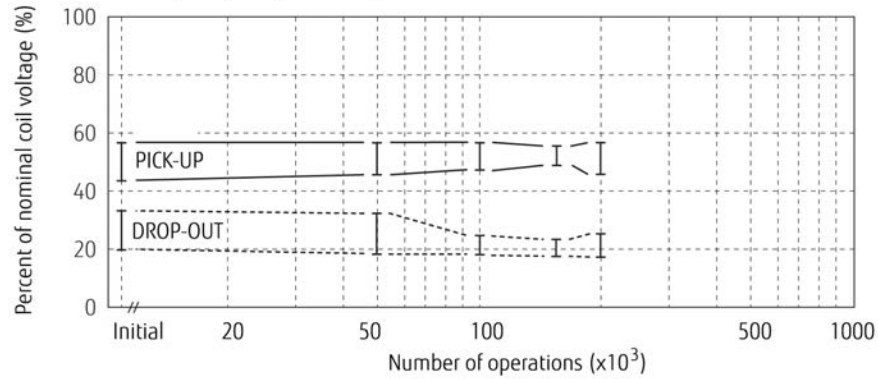
Test circuit



Current wave form

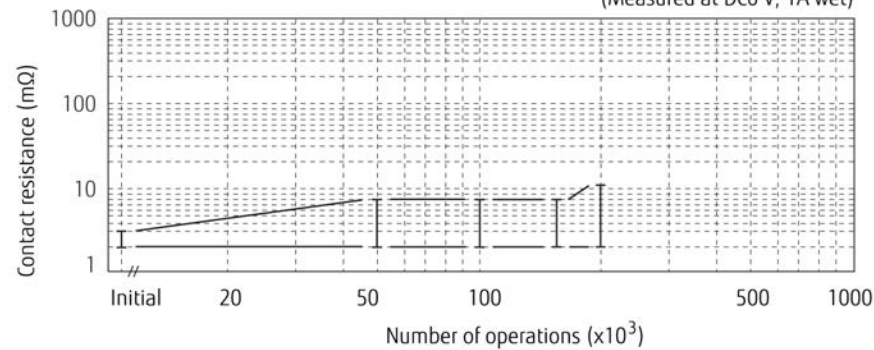


• Shift of pick-up drop-out voltage



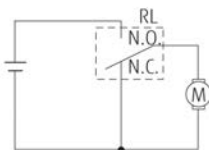
• Change of contact resistance

(Measured at DC6 V, 1A wet)

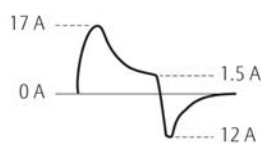


Test condition
Inrush current 17A, 14VDC
motor free
300,000 operations min.
0.25 seconds ON
9.75 seconds OFF

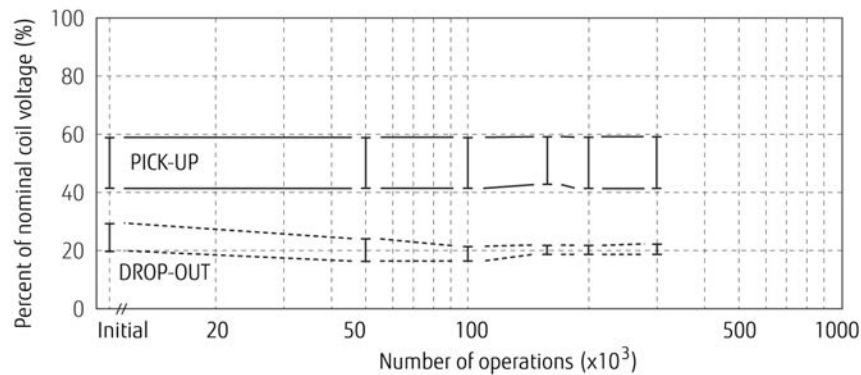
Test circuit



Current wave form

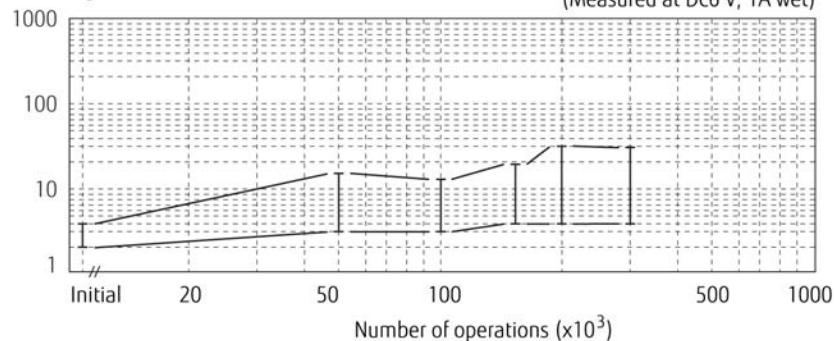


• Shift of pick-up drop-out voltage



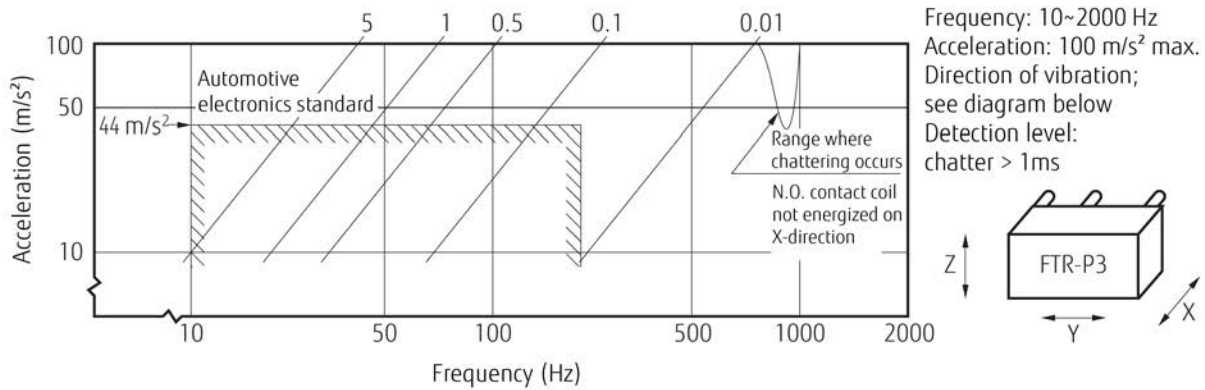
• Change of contact resistance

(Measured at DC6 V, 1A wet)

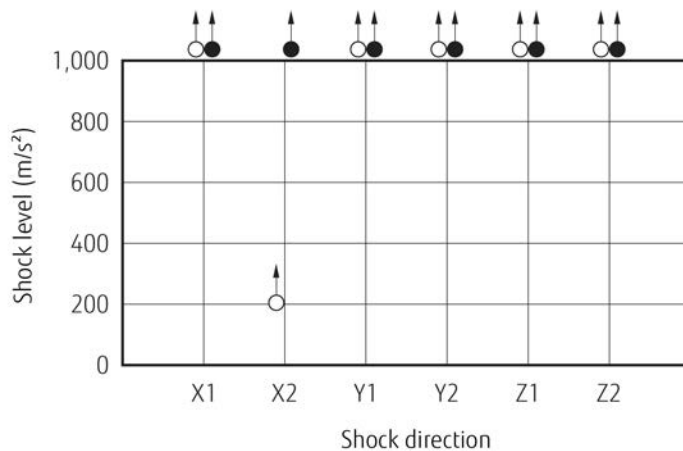


FTR-P3 SERIES

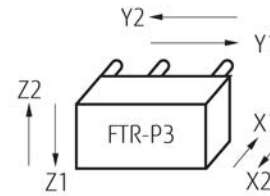
Vibration resistance characteristics
Dual amplitude (mm)



Shock resistance characteristics

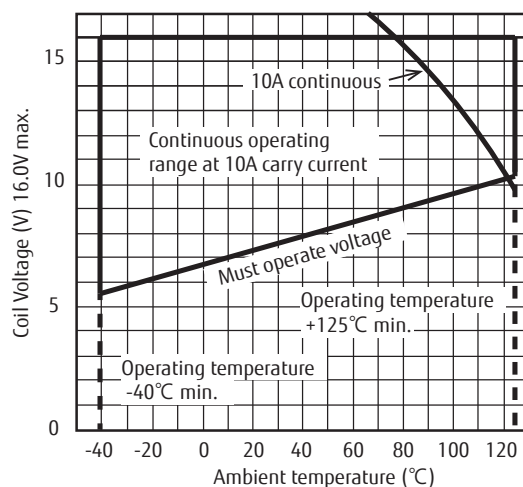


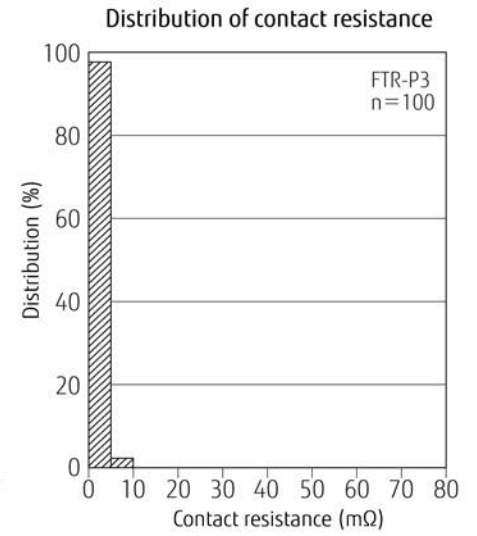
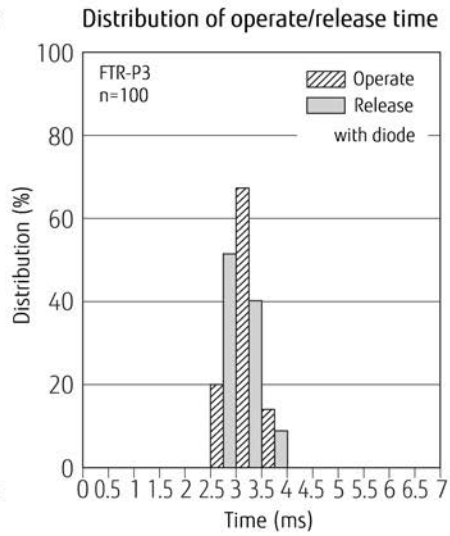
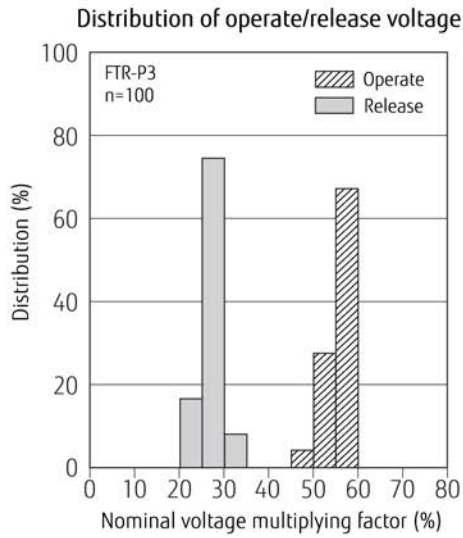
Shock application time: 11±1ms, half-sine wave
Test material: coil energized and de-energized
Shock direction: see diagram below
Detection level: chatter > 1ms



○ : break contact (coil de-energized)
● : make contact (coil energized)

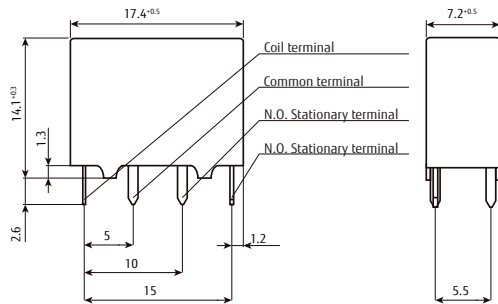
Operating coil voltage range (ftr-p3 (A;C) N012-W1-06)





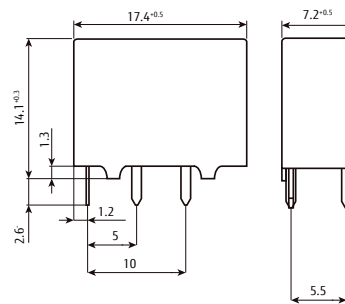
DIMENSIONS

FTR-P3CN***W1-06 (1 form C) dimensions



* Dimensions of the terminals does not include thickness of pre-solder

FTR-P3AN***W1-06 (1 form A) dimensions

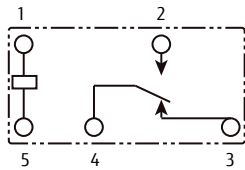


* Dimensions of the terminals does not include thickness of pre-solder

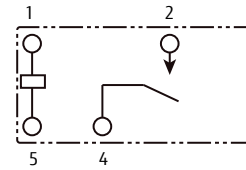
Schematics

(BOTTOM VIEW)

FTR-P3CN***W1-06 (1 form C)



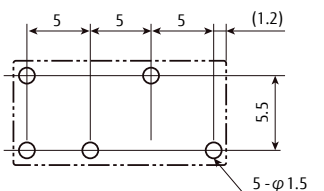
FTR-P3AN***W1-06 (1 form A)



PC board mounting

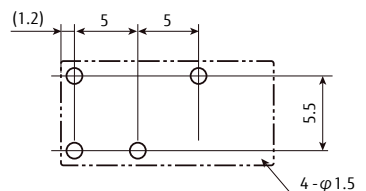
hole layout (Plated through hole)
(BOTTOM VIEW)

FTR-P3CN***W1-06 (1 form C)



Tolerance: +0.1 / - 0 mm unless otherwise specified

FTR-P3AN***W1-06 (1 form A)



Tolerance: +0.1 / - 0 mm unless otherwise specified

Unit: mm

General Information

1. RoHS Compliance

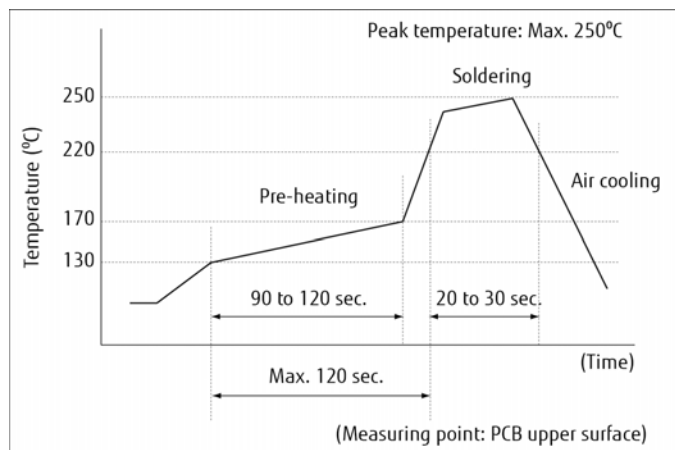
- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU including amendments.
- Use of Cadmium in electrical contacts is exempted as per Annex III of the RoHS directive 2001/65/EU. Please consider expiry date of exemption. Relays with Cadmium containing contacts are not to be used for new designs.
- 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>

2. Recommended Lead Free Solder Condition

- 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.
- Recommended solder for assembly: Sn-3.0Ag-0.5Cu.

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 2a, Relays are delivered in moisture barrier bags.

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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