FUJITSU

SILENT TWIN RELAY

1 POLE x 2 - 25A, H-Bridge (for automotive applications)

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^2 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

	FTR-P2	C	N	012	W1
[Example]	(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
	Max. switching current		35A
	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)
Other	Vibration resistance (operational)		10 to 55Hz double amplitude 1.5mm
	Shock	Operational	100 m/s² minimum (10G)
		No damage	1,000 m/s² minimum (100G)
	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.

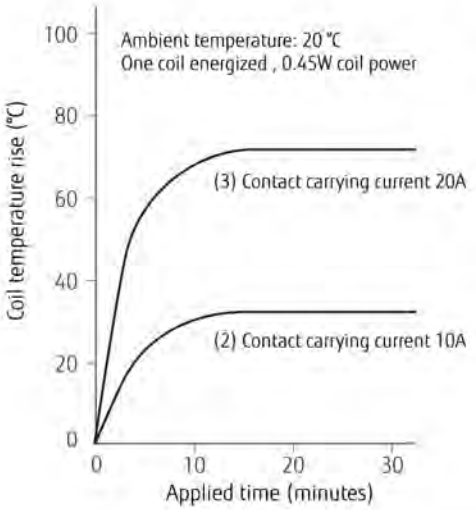
■ COIL RATING

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (V) *	Must Release Voltage (V) *	Power Consumption at Nominal Coil Voltage (mW)
009	9	180	5.5 (at 20 °C)	0.7 (at 20 °C)	450
			6.9 (at 85 °C)	0.9 (at 85 °C)	
010	10	220	6.3 (at 20 °C)	0.8 (at 20 °C)	455
			7.9 (at 85 °C)	1.0 (at 85 °C)	
012	12	320	7.3 (at 20 °C)	1.0 (at 20 °C)	450
			9.2 (at 85 °C)	1.3 (at 85 °C)	

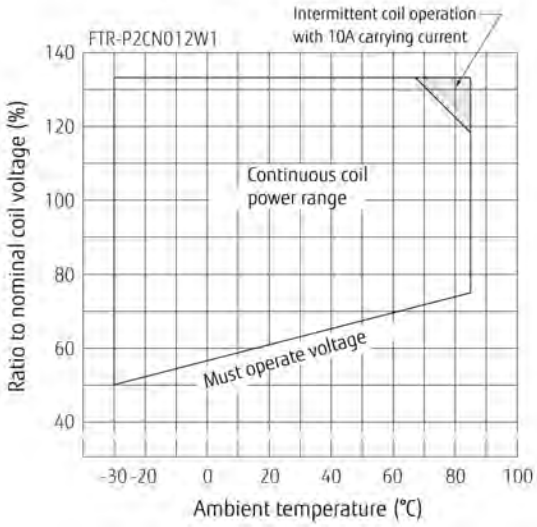
Note: All values in the table are valid for 20°C and zero contact current, unless otherwise stated.
* Specified operate values are valid for pulse wave voltage.

■ CHARACTERISTIC DATA

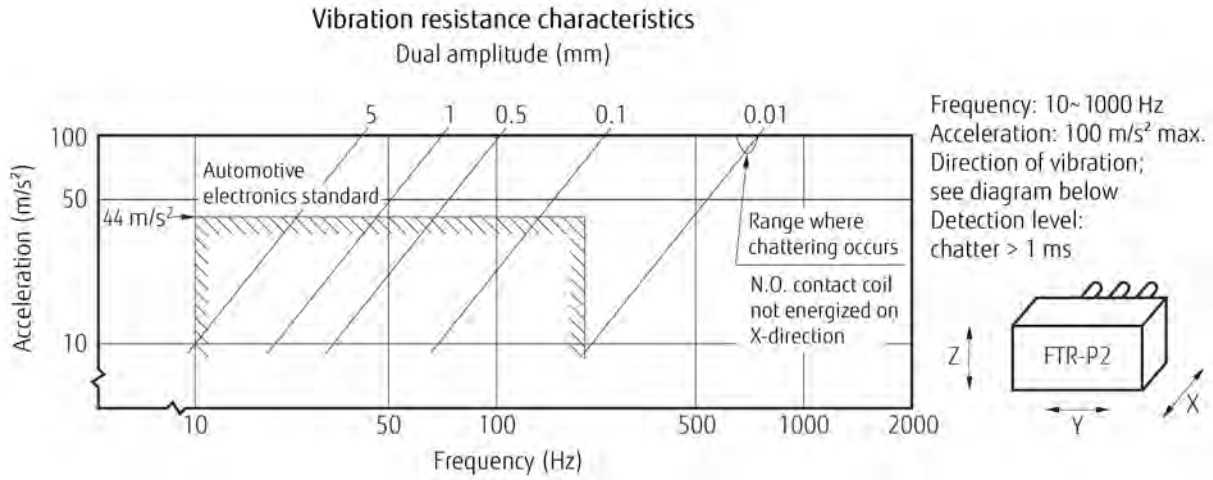
Coil temperature rise



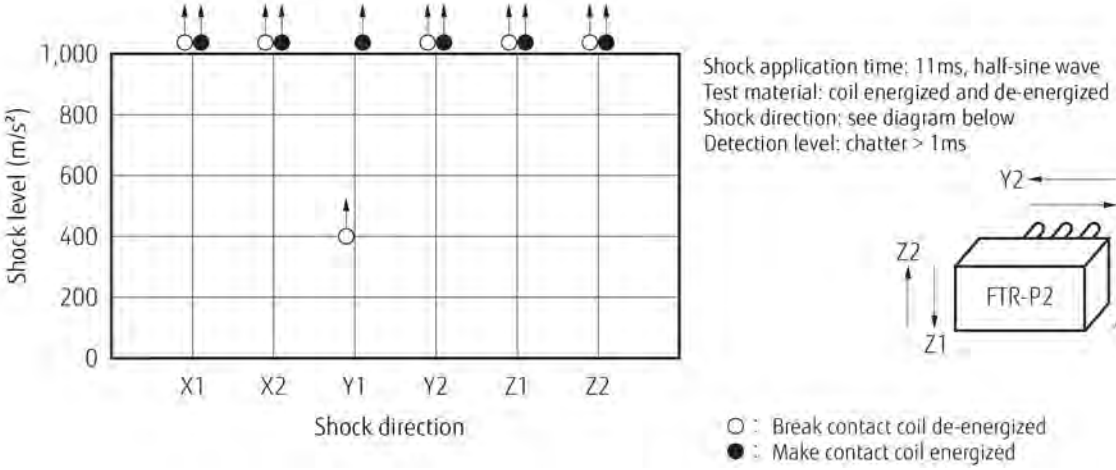
Operating coil voltage range



Vibration resistance characteristics



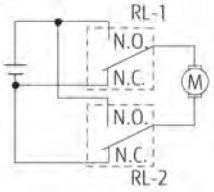
Shock resistance characteristics



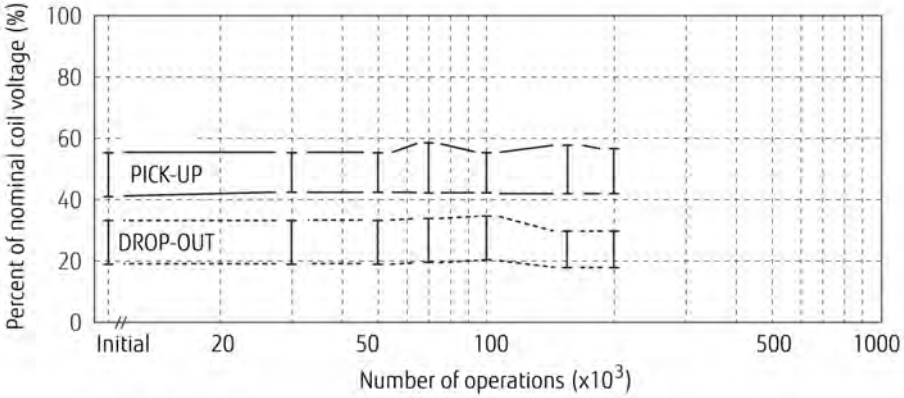
Life Test (examples)

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

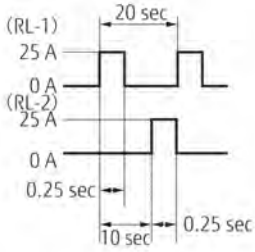
Test circuit



• Shift of pick-up drop-out voltage

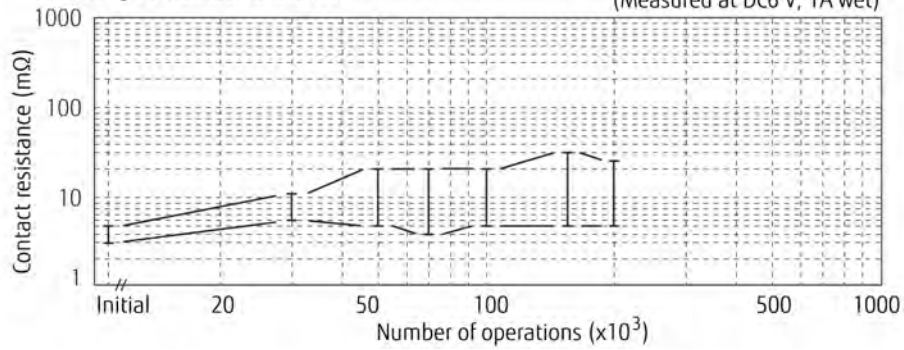


Current wave form



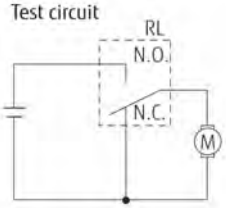
• Change of contact resistance

(Measured at DC6 V, 1A wet)

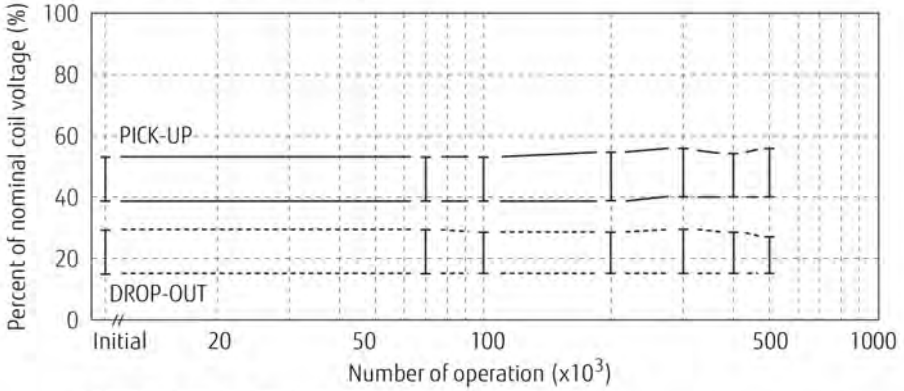


Test condition
Inrush current 17A, 14VDC
motor free
300,000 operations min.
0.25 seconds ON
9.75 seconds OFF

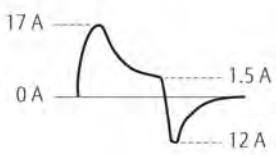
Test circuit



• Shift of pick-up drop-out voltage

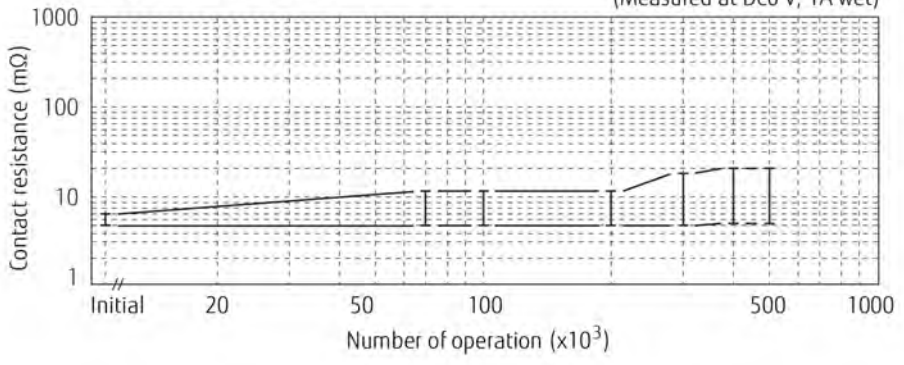


Current wave form

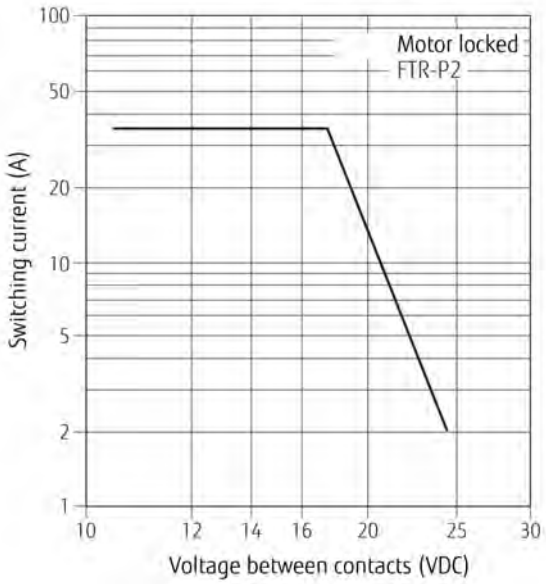


• Change of contact resistance

(Measured at DC6 V, 1A wet)

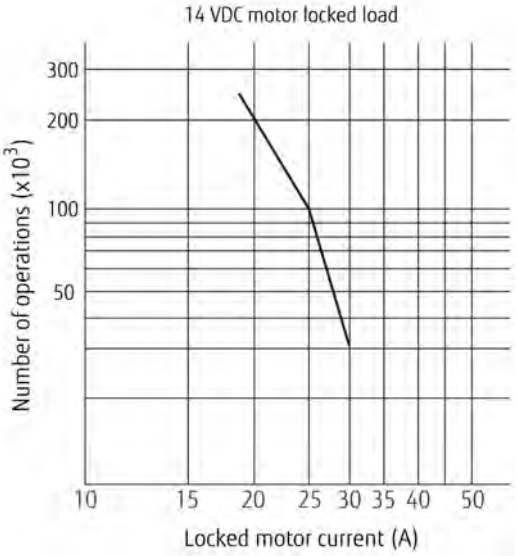


Maximum break capacity

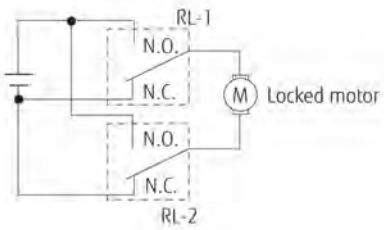


Life

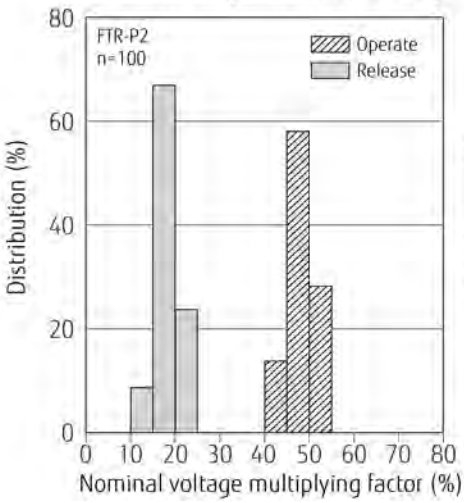
14 VDC motor locked load



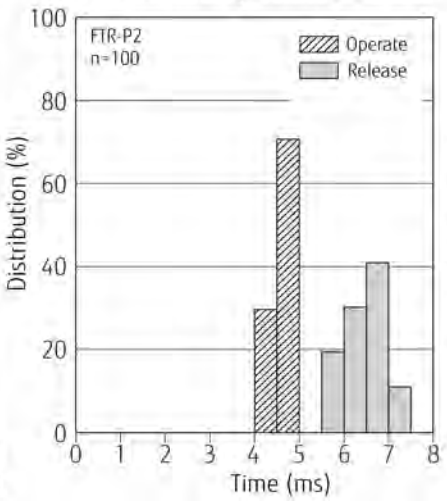
Test circuit



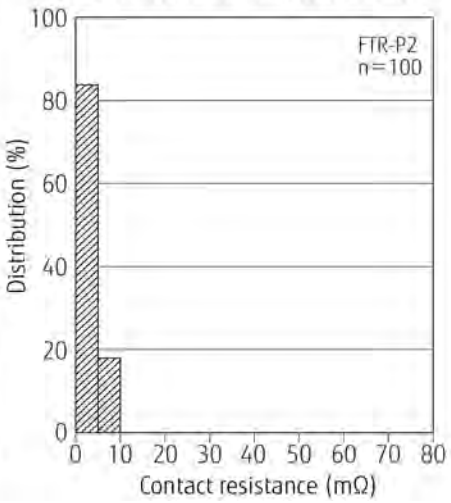
Distribution of operate/release voltage



Distribution of operate/release time

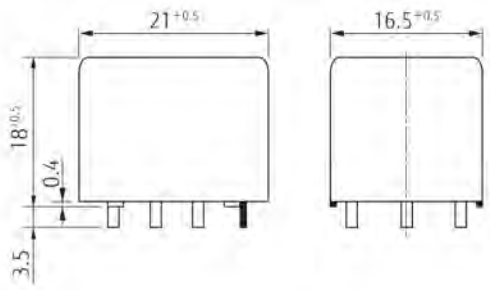


Distribution of contact resistance

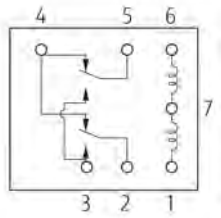


■ DIMENSIONS

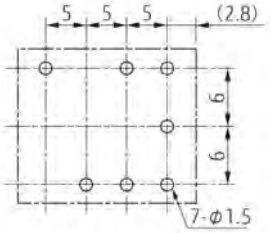
- **Dimensions**



- **Schematics**
(BOTTOM VIEW)

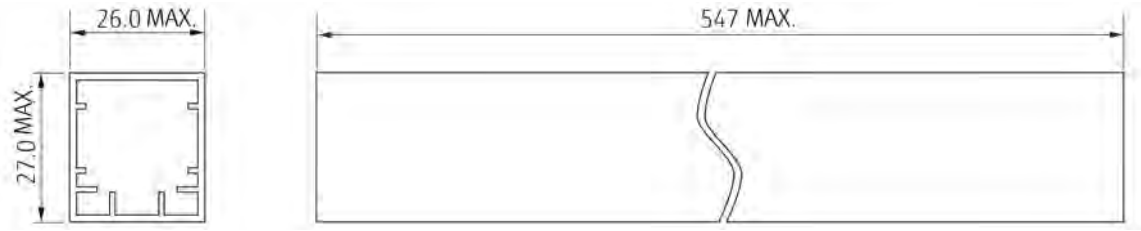


- **PC board mounting hole layout**
(BOTTOM VIEW)



(...) dimension tolerance ±0.1mm

- **Tube carrier**



Unit: mm

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
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 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.

Fujitsu Components International Headquarter Offices

Japan
Fujitsu Component Limited
Gotanda-Chuo Building
3-5, Higashigotanda 2-chome, Shinagawa-ku
Tokyo 141, Japan
Tel: (81-3) 5449-7010
Fax: (81-3) 5449-2626
Email: promothq@ft.ed.fujitsu.com
Web: www.fcl.fujitsu.com

North and South America
Fujitsu Components America, Inc.
250 E. Caribbean Drive
Sunnyvale, CA 94089 U.S.A.
Tel: (1-408) 745-4900
Fax: (1-408) 745-4970
Email: components@us.fujitsu.com
Web: http://us.fujitsu.com/components

Europe
Fujitsu Components Europe B.V.
Diamantlaan 25
2132 WV Hoofddorp
Netherlands
Tel: (31-23) 5560910
Fax: (31-23) 5560950
Email: info@fceu.fujitsu.com
Web: emea.fujitsu.com/components/

Asia Pacific
Fujitsu Components Asia Ltd.
102E Pasir Panjang Road
#01-01 Citilink Warehouse Complex
Singapore 118529
Tel: (65) 6375-8560
Fax: (65) 6273-3021
Email: fcal@fcal.fujitsu.com
Web: http://www.fujitsu.com/sg/services/micro/components/