

# COMPACT POWER TWIN RELAY

## 1POLE X 2, H-BRIDGE—25 A FOR AUTOMOTIVE APPLICATIONS

### FTR-P4 Series

#### ■ FEATURES

- Compact for high density packaging.  
(60% volume of previous generation FBR512).
- High contact capacity with proven contact material.  
(100,000 operations, 14 V, 25 A achieved, even with reduced size).
- Coil power savings  
(600mW nominal achieved with state-of-the-art magnetic analysis/design).
- 125°C version is available.
- Ease of PCB layout  
(all terminals on perimeter, coil and contact terminals separated).
- Pin compatible with low acoustic noise relay, FTR-P2.
- Optional over-voltage circuit breaking capability  
(0.6mm gap, contact our representative).
- Packaging for auto-insertion  
(tube packing, 30 relays/tube).



#### ■ ORDERING INFORMATION

[Example]  $\frac{\text{FTR-P4}}{\text{(a)}} \frac{\text{C}}{\text{(b)}} \frac{\text{N}}{\text{(c)}} \frac{\text{012 W1}}{\text{(d)} \text{(e)}} \frac{\text{***}}{\text{(f)}}$

(a)	Series Name	FTR-P4 Series
(b)	Contact Arrangement	C : 1 Form C x 2 (H-Bridge)
(c)	Contact Gap	N : 0.3mm gap P : 0.6mm gap
(d)	Nominal Coil Voltage	009 : 9VDC 010 : 10VDC 012 : 12VDC
(e)	Contact Material	W1 : Silver-tin oxide-indium
(f)	Custom Designation	Nil : Standard (85°C) -01 : High temperature (125°C)

Note: The part number stamped on the relay cover does not include "FTR".

Example: Ordering part number: FTR-P4CN012W1

Stamped on part number: P4CN012W1

#### ■ TYPICAL APPLICATIONS

Power window  
Door lock

Power seat  
Sun roof

Tilt steering  
Retractable antenna



# FTR-P4 SERIES

## ■ SPECIFICATIONS

Item		Specification		
		Standard	High Temperature version	
Contact	Arrangement	1 form C x 2 (H-Bridge)		
	Material	Silver-tin oxide-indium		
	Voltage Drop (Resistance)	Maximum 100 m (at 2 A 12 VDC)		
	Rating	25 A at 14 VDC (locked motor load)		
	Maximum Carrying Current	25 A / 1 hour (20° C, 100% rated coil voltage)		
	Maximum Inrush Current (Reference)	35 A		
	Maximum Switching Current (Reference)	35 A at 16 VDC		
	Minimum Switching Load*1 (Reference)	1 A, 6 VDC		
Coil	Operating Temperature Range	-40° C to +85° C (no frost)	-40° C to +125° C (no frost)	
	Storage Temperature Range	-40° C to +100° C (no frost)	-40° C to +125° C (no frost)	
Timing Values	Operate (at nominal voltage)	Maximum 10ms (not including bounce)		
	Release (at nominal voltage)	Maximum 5ms (not including bounce, no diode) Maximum 15ms (not including bounce, with diode)		
Life	Mechanical	10 x 10 <sup>6</sup> operations minimum		
	Electrical	100 x 10 <sup>3</sup> operations minimum 14 VDC, 25 A (locked motor load) (1 operation = 1 forward, 1 reverse)		
Other	Vibration Resistance	Operational	10-55Hz, 1.5mm double amplitude (=9.13G @ 55Hz) 55-100Hz, 45m/sec <sup>2</sup> (4.6G)	
		Shock Resistance	Operational	100 m/s <sup>2</sup> minimum (10G)
		Endurance	1, 000 m/s <sup>2</sup> minimum (100G)	
	Insulation Resistance (initial)		100M ohms @500 VAC	
	Dielectric Withstanding Voltage (initial)		500 VAC	
	Weight		Approximately 9.0g	

\*1 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.

# FTR-P4 SERIES

## ■ COIL DATA CHART

FTR-P4 Series

Model	Nominal Coil Voltage	Coil Resistance ( $\pm 10\%$ at 20° C)	Must Operate Voltage	Must Release Voltage (at 20° C)	Coil Power at Nominal Voltage	Thermal Resistance (approx.)
FTR-P4CN009W1 ( )	9VDC	135 $\Omega$	5.5VDC (at 20° C) 6.9VDC (at 85° C)	0.75VDC	0.6W	73° C/W
FTR-P4CN010W1 ( )	10VDC	167 $\Omega$	6.3VDC (at 20° C) 7.9VDC (at 85° C)	0.9VDC	0.6W	73° C/W
FTR-P4CN012W1 ( )	12VDC	240 $\Omega$	7.3VDC (at 20° C) 9.2VDC (at 85° C)	1.0VDC	0.6W	73° C/W

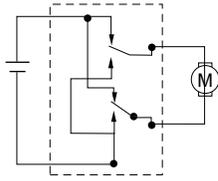
Note: ( ) is "Nil" or "-01"

# FTR-P4 SERIES

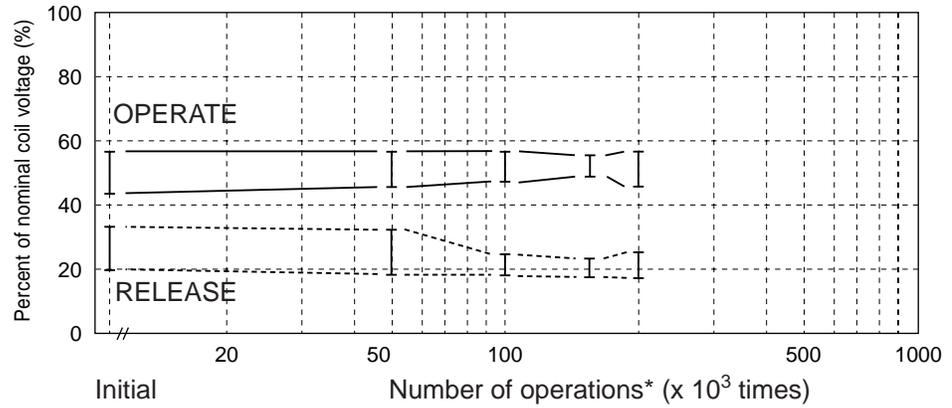
## CHARACTERISTIC DATA

### 1. LIFE TEST (EXAMPLES)

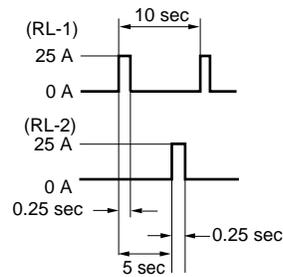
- Test item  
14 V DC-25 A  
locked motor  
100K operations\* minimim  
0.25 seconds ON,  
9.75 seconds OFF



- Change of operate and release voltage



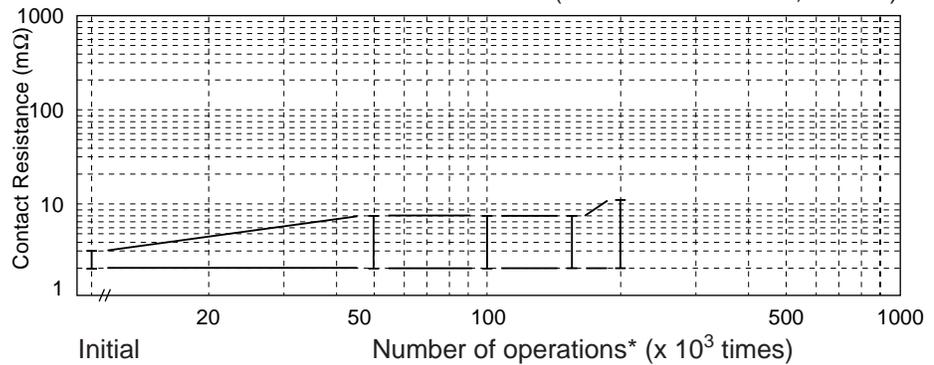
- Current wave form



- \* 1 operation = 1 forward and 1 reverse

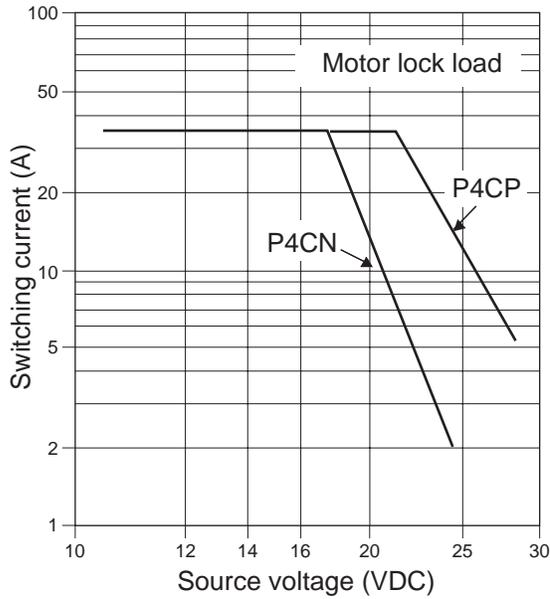
- Change in contact resistance

(Measured at 6 VDC, 1A wet)

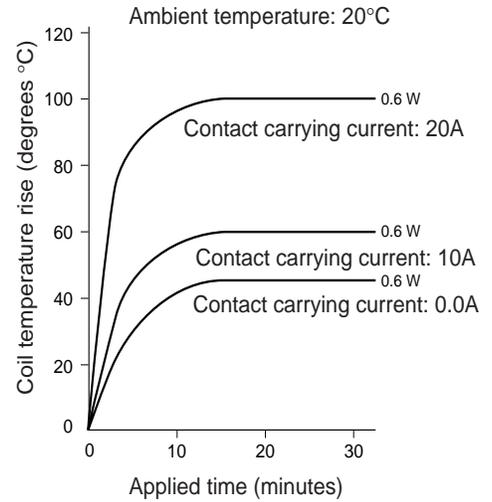


# FTR-P4 SERIES

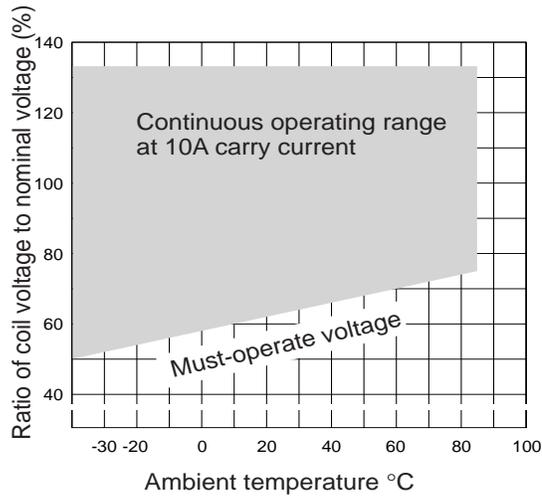
## 2. MAXIMUM BREAK CAPACITY



## 3. COIL TEMPERATURE RISE

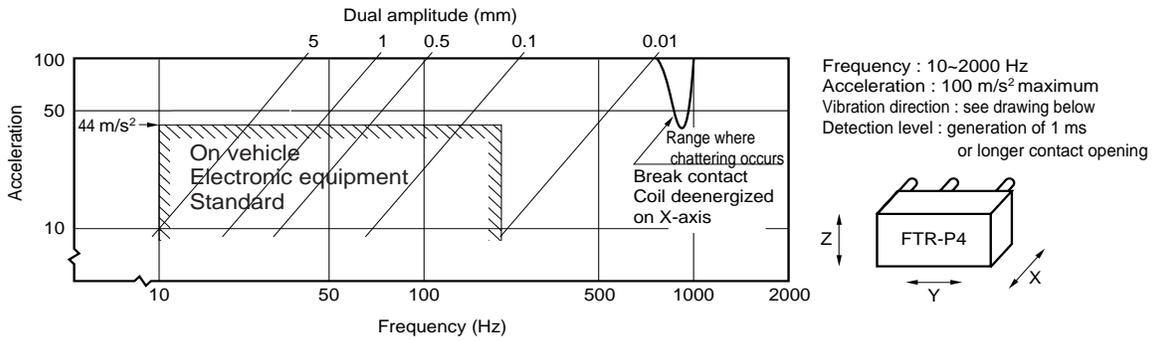


## 4. OPERATING COIL VOLTAGE RANGE

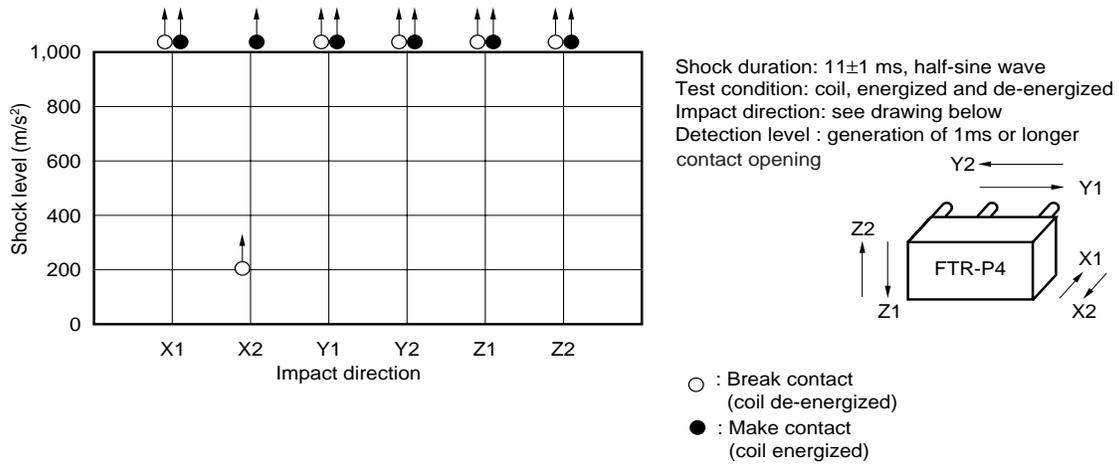


# FTR-P4 SERIES

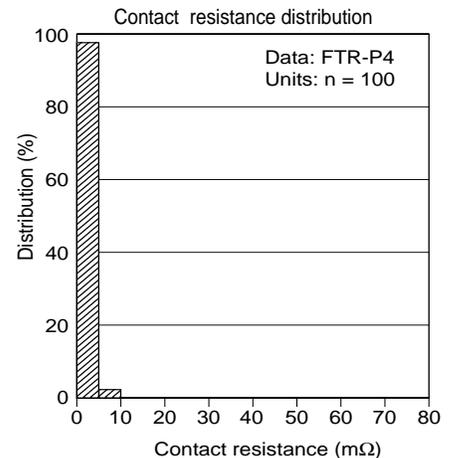
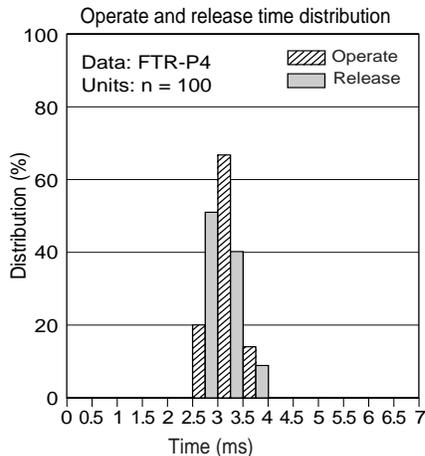
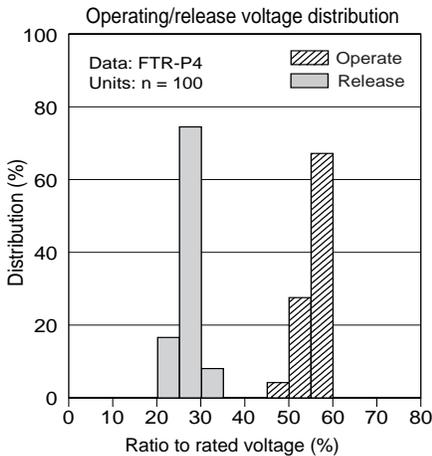
## 5. VIBRATION RESISTANCE CHARACTERISTIC



## 6. SHOCK RESISTANCE CHARACTERISTIC

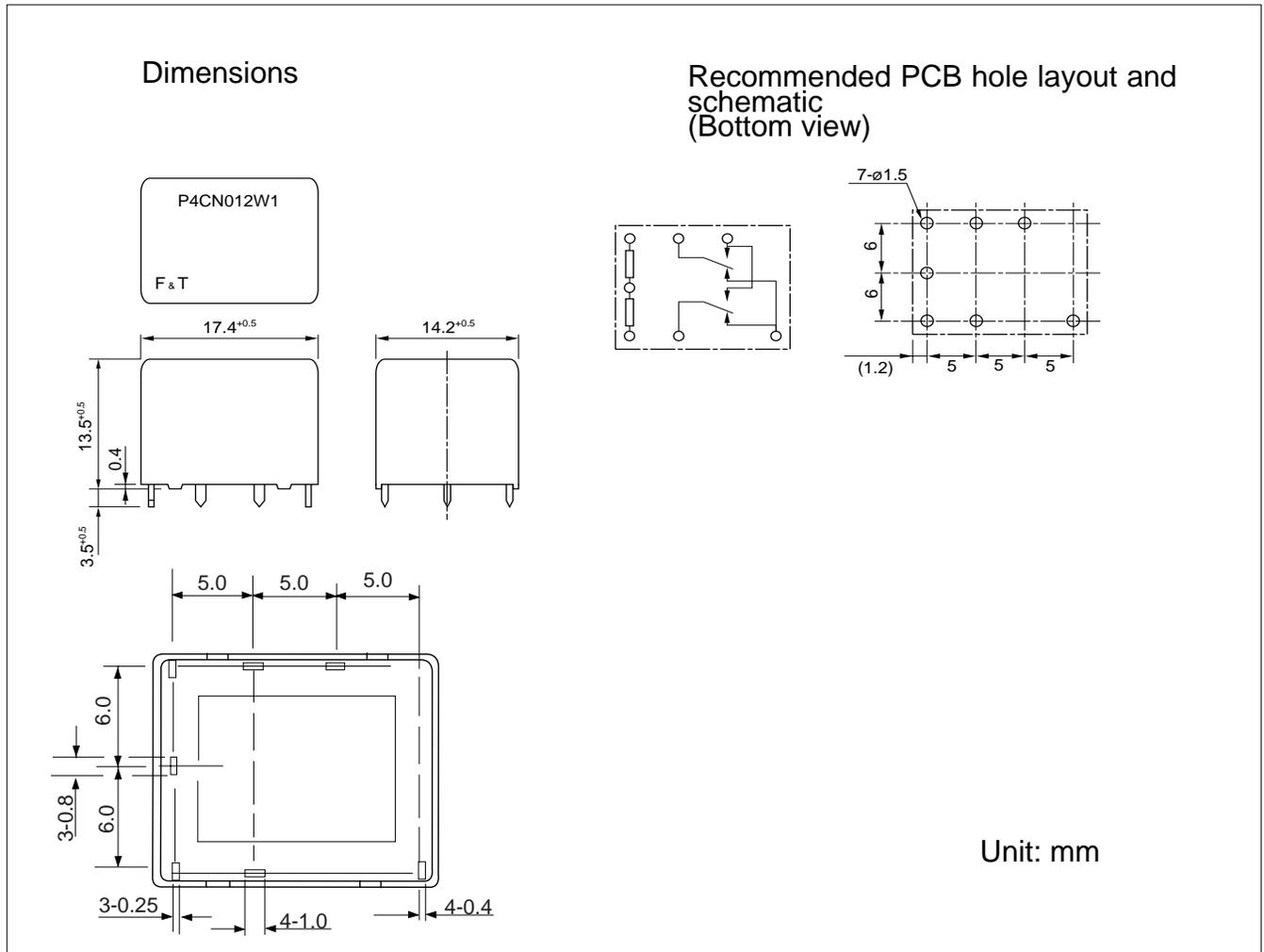


## REFERENCE DATA



# FTR-P4 SERIES

## ■ DIMENSIONS AND SCHEMATICS



## ■ PRECAUTIONS

Please refer to the Engineering Reference in our relay databook for general precautions.

### 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](mailto:promothq@ft.ed.fujitsu.com)  
Web: [www.fcl.fujitsu.com](http://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: [marcom@fcai.fujitsu.com](mailto:marcom@fcai.fujitsu.com)  
Web: [www.fcai.fujitsu.com](http://www.fcai.fujitsu.com)

**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](mailto:info@fceu.fujitsu.com)  
Web: [www.fceu.fujitsu.com](http://www.fceu.fujitsu.com)

**Asia Pacific**  
Fujitsu Components Asia Ltd.  
102E Pasir Panjang Road  
#04-01 Citilink Warehouse Complex  
Singapore 118529  
Tel: (65) 6375-8560  
Fax: (65) 6273-3021  
Email: [fcal@fcal.fujitsu.com](mailto:fcal@fcal.fujitsu.com)  
[www.fcal.fujitsu.com](http://www.fcal.fujitsu.com)