

# POWER RELAY

## 1 POLE—10 A (CADMIUM FREE CONTACTS TYPE)

### FTR-H2 SERIES

RoHS compliant

#### ■ FEATURES

- HIGH DENSITY MOUNTING  
Saves space by 26% compared to FTR-H1 type.
- HIGH ISOLATION  
Insulation Distance: Minimum 6mm between coil and contact  
Dielectric Strength: 4KV  
Surge Strength: 10KV
- TV-5 rating
- HEAT RESISTANCE, FLAMMABILITY  
Class B (130° C) insulation, flammability 94V-0
- CADMIUM FREE CONTACT FOR ECO-PROGRAM
- SAFETY STANDARDS  
UL, CSA, VDE approved, SEMKO (pending)  
UL/CSA TV-5 rating approved
- RoHS compliant since date code: 0437L2  
Please see page 8 for more information



#### ■ ORDERING INFORMATION

[Example]     FTR-H2   A   K   012   T  
                   (a)     (b) (c)   (d)   (e)

(a)	Series name	FTR-H2: FTR-H2 series (10A)
(b)	Contact arrangement	A: 1 Form A (SPST-NO)
(c)	Coil type	K: Standard (530mW) L: High sensitivity (250mW) A: Sealed (530mW)
(d)	Coil nominal voltage	005 : 5DC     012 : 12DC     048 : 48DC 006 : 6DC     018 : 18DC 009 : 9DC     024 : 24DC
(e)	Contact material	T: Silver-tin oxide (TV-5)

# FTR-H2 Series

## ■ PART NUMBERS

Standard: 530 mW, High sensitive (250 mW), Sealed (530 mW)

Ordering Part Number	Series	Contact	Coil Power	Coil Voltage	Contact Material
FTR-H2AK005T	FTR-H2	1 form A	K: 530mW (standard)	5	Silver tin oxide (TV-5 rated)
FTR-H2AK006T				6	
FTR-H2AK009T				9	
FTR-H2AK012T				12	
FTR-H2AK018T				18	
FTR-H2AK024T				24	
FTR-H2AK048T				48	
FTR-H2AL005T			L: 250mW (High sensitivity)	5	
FTR-H2AL006T				6	
FTR-H2AL009T				9	
FTR-H2AL012T				12	
FTR-H2AL024T				24	
FTR-H2AA005T			A: 530mW (sealed)	5	
FTR-H2AA006T				6	
FTR-H2AA009T				9	
FTR-H2AA012T				12	
FTR-H2AA018T				18	
FTR-H2AA024T				24	
FTR-H2AA048T	48				

## ■ COIL DATA CHART

Standard Type (530mW)

Coil Voltage	Nominal Voltage (VDC)	Max. Coil Voltage* <sup>1</sup>	Coil Resistance (±10%)	Must Operate Voltage* <sup>2</sup>	Must Release Voltage* <sup>2</sup>
005	5	8.5 VDC	47 Ω	3.5 VDC	0.25 VDC
006	6	10.2 VDC	68 Ω	4.2 VDC	0.3 VDC
009	9	15.3 VDC	155 Ω	6.3 VDC	0.45 VDC
012	12	20.4 VDC	270 Ω	8.4 VDC	0.6 VDC
018	18	30.6 VDC	610 Ω	12.6 VDC	0.9 VDC
024	24	40.8 VDC	1,110Ω	16.8 VDC	1.2 VDC
048	48	81.6 VDC	4,400 Ω	33.6 VDC	2.4 VDC

# FTR-H2 Series

## Sensitive Type (250mW)

Coil Voltage	Nominal Voltage (VDC)	Max. Coil Voltage* <sup>1</sup>	Coil Resistance (±10%)	Must Operate Voltage* <sup>2</sup>	Must Release Voltage* <sup>2</sup>
005	5	12.5 VDC	100 Ω	4.0 VDC	0.25 VDC
006	6	15.0 VDC	145 Ω	4.8 VDC	0.30 VDC
009	9	22.5 VDC	325 Ω	7.2 VDC	0.45 VDC
012	12	30.0 VDC	575 Ω	9.6 VDC	0.60 VDC
024	24	60.0 VDC	2,310 Ω	19.2 VDC	1.20 VDC

Note: All values in the table are measured at 20°C.

\*1: No contact current at 20°C

\*2: Specified values are subject to pulse wave voltage

## ■ SPECIFICATIONS

Item		Standard		Sensitive		Sealed		
		H2 AK ( ) T		H2 AL ( ) T		H2 AA ( ) T		
Contact	Arrangement		1 form A (SPST-NO)					
	Material		Silver tin oxide					
	Resistance (initial)		Maximum 100 mΩ (at 6VDC, 1A)					
	Rating (resistive)		250 VAC / 30 VDC / 10A					
	Maximum Carrying Current		10A					
	Maximum Switching Rating		2500VA / 300W					
	Maximum Switching Voltage		400VAC / 300VDC					
	Minimum Switching Load*		100 mA, 5 VDC					
Coil	Nominal Power (20°C)		530 mW	250 mW	530 mW			
	Operate Power (20°C)		260 mW	160 mW	260 mW			
	Operating Temperature		-40°C to +70°C (no frost)					
Time Value	Operate Time (at nominal voltage)		Maximum 15 ms					
	Release Time (at nominal voltage)		Maximum 5 ms					
Life	Mechanical		2 x 10 <sup>6</sup> operations minimum					
	Electrical	AC Contact rating	100 x 10 <sup>3</sup> operations min.			50 x 10 <sup>3</sup> operations min.		
		DC Contact Rating	100 x 10 <sup>3</sup> operations minimum			5 x 10 <sup>3</sup> operations minimum		
		Lamp load (TV-5)	25 x 10 <sup>3</sup> operations minimum					
Other	Vibration Resistance	Misoperation	10 to 55 Hz, at double amplitude of 1.5 mm					
		Endurance	10 to 55Hz, at double amplitude of 1.5 mm					
	Shock Resistance	Misoperation	200m/s <sup>2</sup> (11±1ms)					
		Endurance	1,000m/s <sup>2</sup> (11±1ms)					
	Weight		Approximately 12g					

\* Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

# FTR-H2 Series

## ■ INSULATION

Item	FTR-H2	Note
Resistance (initial)	Minimum 1,000 MΩ 1 min.	at 500 VDC
Dielectric Strength	open contacts	1,000 VAC (50/60 Hz) 1 min.
	coil and contacts	4,000 VAC (50/60 Hz) 1 min.
Surge Voltage (coil and contact)	10,000 V	1.2 x 50µs standard wave
Clearance/Creepage	6 mm / 6 mm	
Insulation (DIN EN61810-1 VDE0435)		
Voltage	250 V	
Pollution	2	
Isolation material group	III a	
Isolation category / Reference voltage (VDE 0110b)	B / 250 V	

## ■ SAFETY STANDARDS

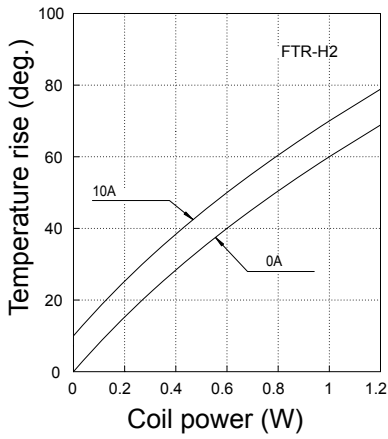
Type	Compliance	Contact rating
UL	UL 508	Flammability: UL 94-V0 (plastics) 5A, 250VAC (resistive) 15A, 125VAC (resistive)
	E63614	
CSA	C22.2 No. 14 LR 40304	1/6 HP, 125VAC 1/2 HP, 250VAC TV-5, 120 VAC Pilot duty: C300
VDE	0435, 0860	10A, 250 VAC (cosØ=1) 3A, 250 VAC cosØ=0.4) 10A, 30 VDC (0ms)
SEMKO	EN 61058-1: 1992 AND A1 EN 61095:1993 and A1+A11	250 VAC, 10 (3) or 5/80 40T70

Complies with CQC, NEMKO, DEMKO, FIMKO,

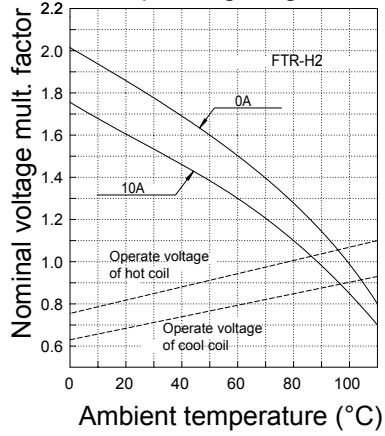
# FTR-H2 Series

## CHARACTERISTIC DATA

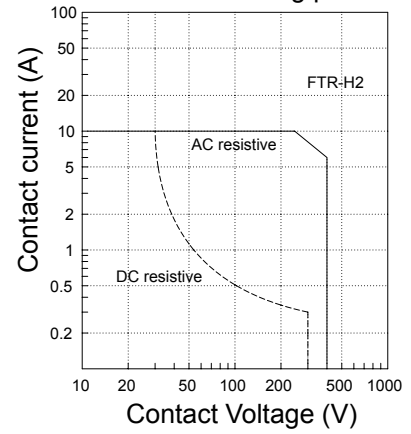
Coil temperature rise



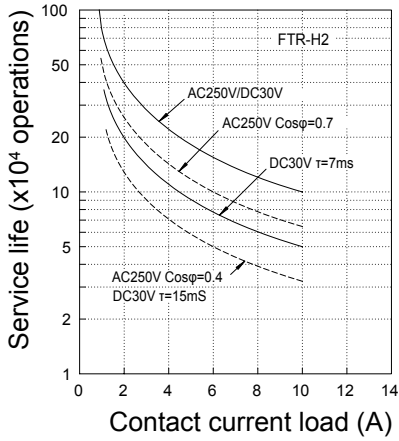
Operating range



Maximum switching power

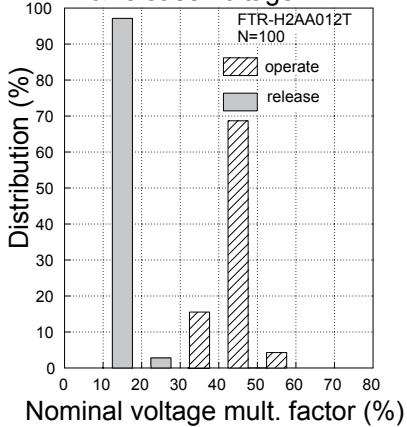


Life curve

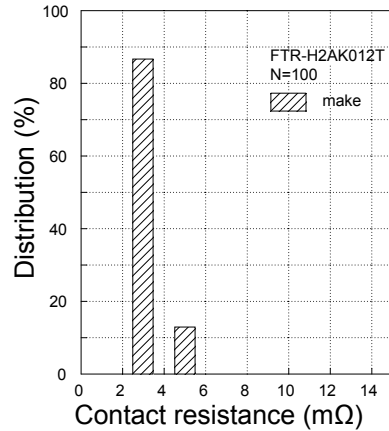


## REFERENCE DATA

Distribution of operate & release voltage

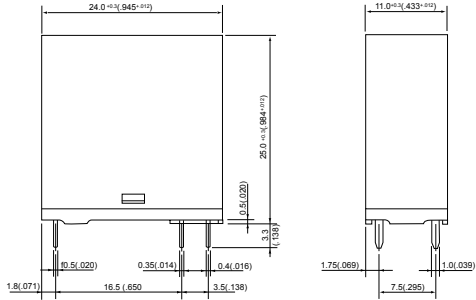


Distribution of contact resistance

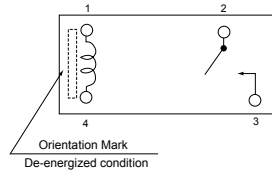


## ■ DIMENSIONS

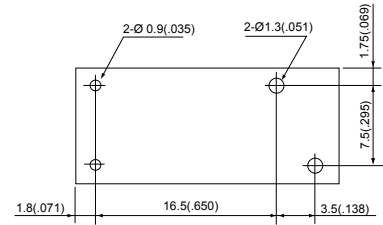
### ● Dimensions



### ● Schematics (BOTTOM VIEW)



### ● PC board mounting hole layout (BOTTOM VIEW)



Unit: mm (in.)

## RoHS Compliance and Lead Free Relay Information

### 1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. Most of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and most power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in lead assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

### 2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu.

#### Reflow Solder condition

**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.

### 4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. 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](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: [components@us.fujitsu.com](mailto:components@us.fujitsu.com)  
Web: <http://www.fujitsu.com/us/services/edevices/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](mailto:info@fceu.fujitsu.com)  
Web: [emea.fujitsu.com/components/](http://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](mailto:fcal@fcal.fujitsu.com)  
Web: <http://www.fujitsu.com/sg/services/micro/components/>

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А