

# POWER RELAY

# 1 POLE—10 A LOW PROFILE TYPE FTR-H1 SERIES

RoHS compliant



## ■ FEATURES

- Compatible with VS series relays
- Working class: B (for IMQ)/ C (for VDE)
- Type of service: continuous duty
- Low profile (height 16.5 mm)
- 1 form A/ 1 form C 10 A, TV-5 rating available
- Transparency cover type available
- UL class B (130°C) insulation
- High isolation in small package
  - Insulation distance : 8 mm (between coil and contacts)
  - Dielectric strength : 5,000 VAC
  - Surge strength : 10,000 V
- Plastic materials —UL94 flame class V-0  
UL CTI level class 2
- Plastic sealed relay
- Pin configuration compatible to VS/ FBR610 Series
- UL, CSA, BSI, VDE, SEMKO recognized
- Conforms to FIMKO, DEMKO
- Environmentally friendly cadmium free contacts type are available
- RoHS compliant since date code: 0434R  
Please see page 8 for more information



## ■ ORDERING INFORMATION

[Example]  $\frac{\text{FTR-H1}}{\text{(a)}} \frac{\text{A}}{\text{(b)}} \frac{\text{A}}{\text{(c)}} \frac{\text{005}}{\text{(d)}} \frac{\text{V}}{\text{(e)}} \frac{\text{-(**)}}{\text{(f)}}$

(a)	Series Name	FTR-H1: FTR-H1 Series
(b)	Contact Arrangement	A : 1 form A (SPST-NO) C : 1 form C (SPDT)
(c)	Coil Type	A : Standard type (530 mW) D : High sensitive type (400 mW standard type only)
(d)	Nominal Voltage	005 : 5 VDC    012 : 12 VDC 006 : 6 VDC    024 : 24 VDC 009 : 9 VDC    048 : 48 VDC
(e)	Contact Material/TV Type	V : Gold plate silver tin oxide (standard type) T : Gold plate silver tin oxide (TV-5 rating type, 1 form A standard type only)
(f)	Custom Designation	Custom specification to be assigned RG : Transparency cover type

Ordering Code      Actual Marking  
FTR-H1AA005V      H1AA005V

# FTR-H1 SERIES

## ■ PART NUMBERS

Standard type (530 mW)

Ordering Part Number	Series	Contact	Coil Power	Coil Voltage	Contact Material	
FTR-H1AA005V	FTR-H1	A: 1 form A	A: 530 mW	5	V: Gold plate silver tin oxide	
FTR-H1AA006V				6		
FTR-H1AA009V				9		
FTR-H1AA012V				12		
FTR-H1AA024V				24		
FTR-H1AA048V				48		
FTR-H1CA005V		C: 1 form C				5
FTR-H1CA006V						6
FTR-H1CA009V						9
FTR-H1CA012V						12
FTR-H1CA024V						24
FTR-H1CA048V						48

TV-5 rating

Ordering Part Number	Series	Contact	Coil Power	Coil Voltage	Contact Material
FTR-H1AA005T	FTR-H1	A: 1 form A	A: 530 mW	5	T: Gold plate silver tin oxide (TV-5)
FTR-H1AA006T				6	
FTR-H1AA009T				9	
FTR-H1AA012T				12	
FTR-H1AA024T				24	
FTR-H1AA048T				48	

High sensitive type (400 mW)

Ordering Part Number	Series	Contact	Coil Power	Coil Voltage	Contact Material	
FTR-H1AD005V	FTR-H1	A: 1 form A	D: 400 mW	5	V: Gold plate silver tin oxide	
FTR-H1AD006V				6		
FTR-H1AD009V				9		
FTR-H1AD012V				12		
FTR-H1AD024V				24		
FTR-H1AD048V				48		
FTR-H1CD005V		C: 1 form C				5
FTR-H1CD006V						6
FTR-H1CD009V						9
FTR-H1CD012V						12
FTR-H1CD024V						24
FTR-H1CD048V						48

# FTR-H1 SERIES

## ■ COIL DATA CHART

Standard type (530 mW)

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	8.2 VDC	47 Ω	3.5 VDC	0.5 VDC
006	6	9.9 VDC	68 Ω	4.2 VDC	0.6 VDC
009	9	14.8 VDC	155 Ω	6.3 VDC	0.9 VDC
012	12	19.8 VDC	270 Ω	8.4 VDC	1.2 VDC
024	24	39.6 VDC	1,100 Ω	16.8 VDC	2.4 VDC
048	48	79.2 VDC	4,400 Ω	33.6 VDC	4.8 VDC

High sensitive type (400 mW)

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	9.7 VDC	62 Ω	3.75 VDC	0.5 VDC
006	6	11.7 VDC	90 Ω	4.5 VDC	0.6 VDC
009	9	17.5 VDC	202 Ω	6.75 VDC	0.9 VDC
012	12	23.4 VDC	360 Ω	9.0 VDC	1.2 VDC
024	24	46.8 VDC	1,440 Ω	18.0 VDC	2.4 VDC
048	48	93.6 VDC	5,760 Ω	36.0 VDC	4.8 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

# FTR-H1 SERIES

## ■ SPECIFICATIONS

Item		FTR-H1 (AC) A ( )	FTR-H1 AA ( )T	FTR-H1 (AC) D ( )V
Contact	Arrangement	1 form A (SPST-NO), 1 form C (SPDT)	1 form A (SPST-NO)	1 form A (SPST-NO) 1 form C (SPDT)
	Material	Movable: gold plate silver tin oxide, stationary: silver tin oxide		
	Configuration	Single		
	Resistance (initial)	Maximum 100 mΩ at 1 A, 6 VDC		
	Rating	10 A, 250 VAC / 30 VDC		
	Maximum Carrying Current*1	14 A		
	Maximum Switching Rating	2,500 VA / 300 W		
	Maximum Switching Voltage	400 VAC / 300VDC		
	Maximum Switching Load*2	10 mA 5 VDC		
Coil	Nominal Power (at 20°C)	530 mW		400 mW
	Operate Power (at 20°C)	260 mW		230 mW
	Operating Temperature	-40°C to +75°C (no frost) (Refer to Characteristic Data) -40°C to +70°C (transparency cover type)		
Time Value	Operate (at nominal value)	Maximum 10 ms		
	Release (at nominal value)	Maximum 5 ms		
Life	Mechanical	2 x 10 <sup>7</sup> operations minimum		
	Electrical	AC load	1 x 10 <sup>5</sup> operations minimum	
		DC load	1 x 10 <sup>5</sup> operations minimum	
		Lamp load (TV-5)	-	2.5 x 10 <sup>4</sup> ops. min.
Other	Vibration Resistance	Misoperation	10 to 55 Hz, at double amplitude of 1.65 mm	
		Endurance	10-55Hz, at double amplitude of 3.3 mm	
	Shock Resistance	Misoperation	Min. 100m/s <sup>2</sup> (11±1ms)	
		Endurance	Min. 1,000m/s <sup>2</sup> (6±1ms)	
	Weight	Approximately 12g		

\*1 Need to consider the head from PCB when max. current is more than 10A.

\*2 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-H1 SERIES

## ■ INSULATION

Item	FTR-H1	
Resistance (at 500 VDC)	Minimum 1,000 MΩ 1 min.	
Dielectric Strength	open contacts	1,000 VAC (50/60 Hz) 1 min.
	coil and contacts	5,000 VAC (50/60 Hz) 1 min.
Surge Voltage (coil and contact)	10,000 V (1.2 x 50µs standard wave)	
Clearance/Creepage	8 mm / 8 mm	
Insulation (DIN EN61810-1 VDE0435)		
Voltage	250 V	
Pollution	3	
Isolation material group	IIIa	
Isolation category / Reference voltage (VDE0110b)	C / 250 V	

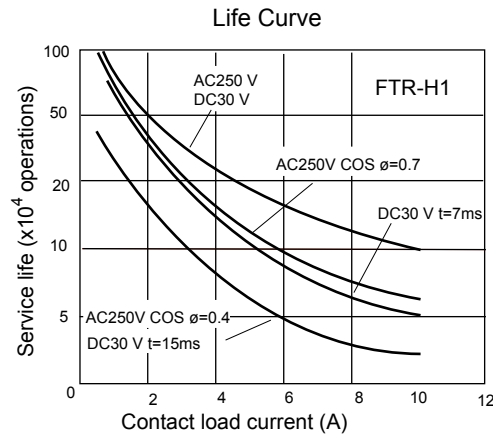
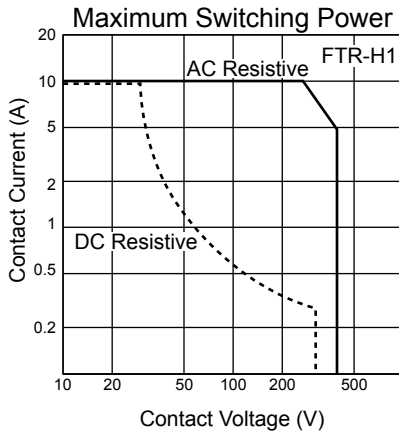
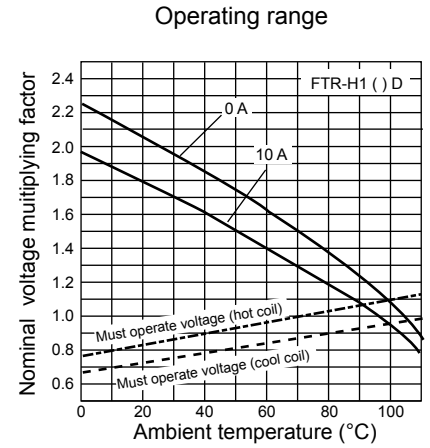
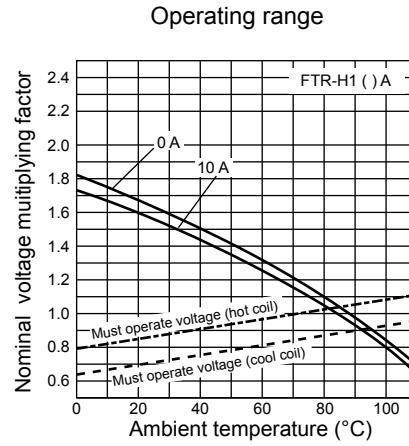
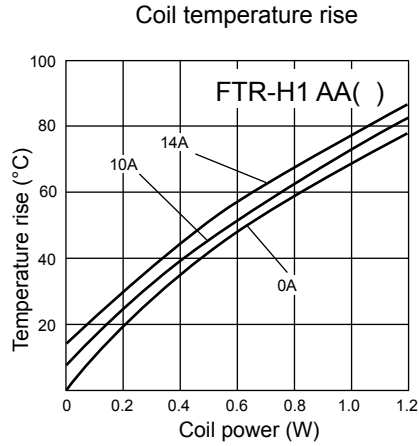
## ■ SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 508	Flammability: UL 94-V0 (plastics)
	E63614	10A, 30 VAC (resistive) 10A, 250 VAC (resistive)
CSA	C22.2 No. 14	12A, 250VAC (resistive)
	LR 40304	1/3 HP, 125VAC 1/2 HP, 125VAC Pilot duty: B300 TV-5 (only T type)
VDE	0435, 0631, 0700, 0860	10A, 250 VAC (cosØ=1), 3A, 250 VAC (cosØ=0.4) 10 250 VAC (0ms) 5/80A, 250 VAC (T type)

Complies with SEMKO, BSI, CQC, NEMKO, DEMKO, FIMKO

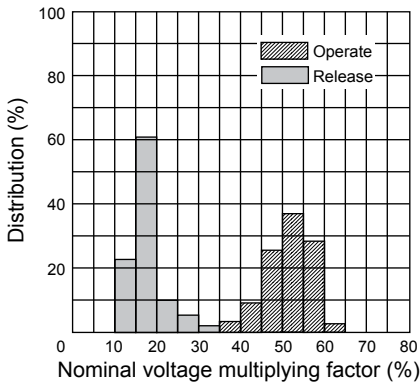
# FTR-H1 SERIES

## CHARACTERISTIC DATA



## REFERENCE DATA

Distribution of operate and release voltage

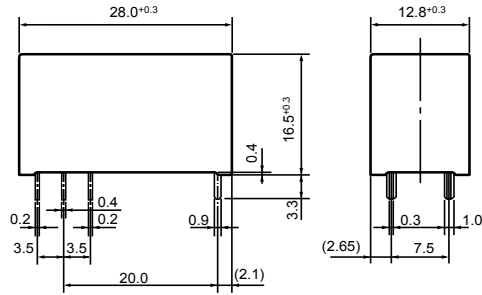


# FTR-H1 SERIES

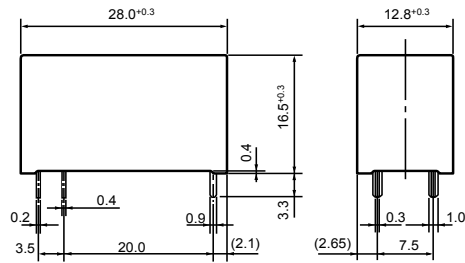
## ■ DIMENSIONS

### ● Dimensions

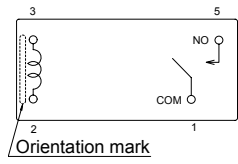
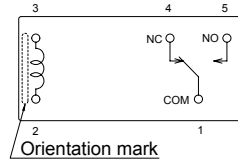
#### FTR-H1C type



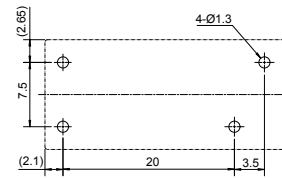
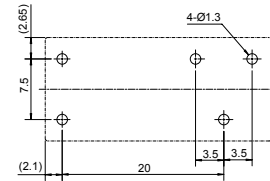
#### FTR-H1A type



### ● Schematics (BOTTOM VIEW)



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



Unit: mm

## 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. All 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 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 leaded 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.



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