FUJITSU THE POSSIBILITIES ARE INFINITE

POWER RELAY

2 POLES—5 A LOW PROFILE TYPE

FTR-F1 SERIES

RoHS compliant

■ FEATURES

- Low profile power relay (height 16.5 mm) employing unique construction
- DPST/DPDT 5 A, TV-3 rating available
- Higher isolation by employing reinforced insulation co struction
  - Insulation distance: 8 mm (between coil and contact)
  - Dielectric strength: 5 kV (between coil and contact)
  - Surge strength: 10 kV (between coil and contact)
- Plastic sealed relay
- Pin configuration compatible to VB/FBR620
- UL, CSA, VDE, SEMKO, BSI recognized
- Conforms to FIMKO, IMQ, DEMKO (under approval)
- Environmentally friendly cadmium free contact type is available
- RoHS compliant since date code: 0434R
  Please see page 7 for more information

■ ORDERING INFORMATION

[Example] FTR-F1 (a) A (b) A (c) 005 (d) V (e) – ** (f)

(a)	Series Name	FTR-F1 : FTR-F1 Series
(b)	Contact Arrangement	A : 2 form A (DPST-NO) C : 2 form C (DPDT)
(c)	Coil Type	A : Standard type (0.53 W) D : High sensitive type (0.4W)
(d)	Nominal Voltage	003 : 3 VDC (high sensitive type 'D' only) 005 : 5 VDC 009: 9 VDC 024: 24 VDC 006 : 6 VDC 012: 12 VDC 048: 48 VDC
(e)	Contact Material/TV Type	V : Gold plate silver alloy (standard type) T : Gold plate silver alloy (TV-3 rating type, only standard make type)
(f)	Custom Designation	To be assigned custom specification

Ordering Code: FTR-F1AA005V
Actual Marking: F1AA005V

■ SAFETY STANDARD AND FILE NUMBERS

UL508, 873 (File No. E63614)
C 22.2 No. 14 (File No. LR40304-30/ LR107822)
VDE 0435, 0631, 0700, 0860 (File No. 11039-4940-1019)

	Type	Nominal voltage	Contact rating
TV-Rating	FTR-F1AA( )T	5 to 48 VDC	TV-3 120 VAC 1/6 HP 125 VAC 1/4 HP 250 VAC 5 A 24 VDC/250 VAC resistive Pilot duty R 300
Standard/ sensitive	FTR-F1CA()V	5 to 48 VDC	Same as above without TV-3 2A 250VAC inductive (PF=0.4)

■ SPECIFICATIONS

Item			Standard Type	Sensitive Type	TV-3 Rating Type
Contact	Arrangement		2 form A (DPST-NO), 2 form C (DPDT)		2 form A (DPST-NO)
	Material		Gold plate silver alloy		
	Style		Single		
	Resistance (initial)		Maximum100 mΩ (at 1 A 6 VDC)		
	Rating (resistive)		5 A 250 VAC/24 VDC		
	Maximum Carrying Current		7 A		
	Maximum Switching Rating		1,250 VA/120 W		
	Maximum Switching Voltage		400 VAC 300 VDC		
	Maximum Switching Current		5 A		
	Minimum Switching Load*1		10 mA 5 VDC		
	Maximum Inrush Current		—		51 A 120 VAC (at lamp load)
Coil	Nominal Power (at 20°C)		0.53 W	0.4 W	0.53 W
	Operate Power (at 20°C)		0.26 W	0.225W	0.26W
	Operating Temperature		–40°C to +75°C (no frost) (refer to the CHARACTERISTIC DATA)		
Time Value	Operate (at nominal voltage)		Maximum 15 ms		
	Release (at nominal voltage)		Maximum 5 ms		
Insulation	Resistance (at 500 VDC)		Minimum 1,000 MΩ		
	Dielectric Strength	between open contacts	1,000 VAC 1 minute (3,000 VAC between adjacent contacts)		
		between coil and contacts	5,000 VAC 1 minute		
	Surge Strength		10,000 V (at 1.2 × 50 μs)		
Life	Mechanical		2×10^7 operations minimum		
	Electrical	Contact Rating	1×10^5 operations minimum		
		Lamp Load	—		2.5×10^4 ops. minimum
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 1.65 mm)		
		Endurance	10 to 55 Hz (double amplitude of 3.3 mm)		
	Shock Resistance	Misoperation	100 m/s^2 (11 ±1 ms)		
		Endurance	1,000 m/s^2 (6 ±1 ms)		
	Weight		Approximately 12 g		

*1 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 ex-

■ COIL DATA CHART

MODEL		Nominal voltage	Coil resistance (±10%)	Must operate voltage	Must release voltage
Standard Type	TV-3 Rating Type				
FTR-F1 (C, A) A005 V	FTR-F1AA005 T	5 VDC	47 Ω	3.5 VDC	0.5 VDC
FTR-F1 (C, A) A006 V	FTR-F1AA006 T	6 VDC	68 Ω	4.2 VDC	0.6 VDC
FTR-F1 (C, A) A009 V	FTR-F1AA009 T	9 VDC	155 Ω	6.3 VDC	0.9 VDC
FTR-F1 (C, A) A012 V	FTR-F1AA012 T	12 VDC	270 Ω	8.4 VDC	1.2 VDC
FTR-F1 (C, A) A024 V	FTR-F1AA024 T	24 VDC	1,100 Ω	16.8 VDC	2.4 VDC
FTR-F1 (C, A) A048 V	FTR-F1AA048 T	48 VDC	4,400 Ω	33.6 VDC	4.8 VDC

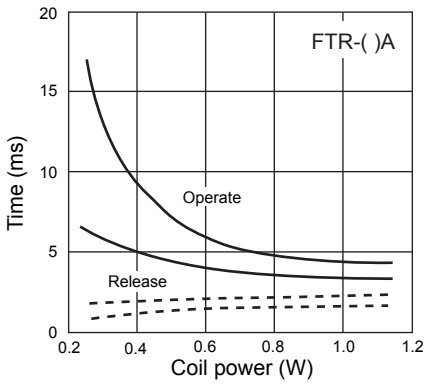
Note: All values in the table are measured at 20°C.

Sensitive Type

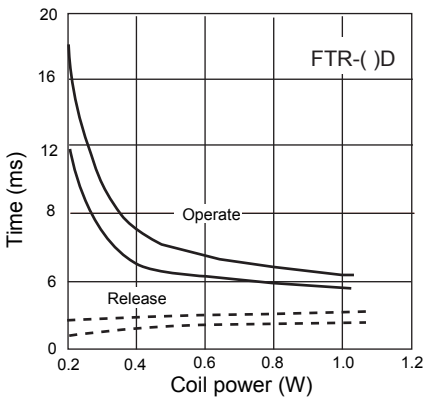
MODEL	Nominal voltage	Coil resistance (±10%)	Must operate voltage	Must release voltage
Standard Type				
FTR-F1 (C, A) D003 V	3 VDC	22.5 Ω	2.25 VDC	0.3 VDC
FTR-F1 (C, A) D005 V	5 VDC	62 Ω	3.75 VDC	0.5 VDC
FTR-F1 (C, A) D006 V	6 VDC	90 Ω	4.5 VDC	0.6 VDC
FTR-F1 (C, A) D009 V	9 VDC	202 Ω	6.75 VDC	0.9 VDC
FTR-F1 (C, A) D012 V	12 VDC	360 Ω	9.0 VDC	1.2 VDC
FTR-F1 (C, A) D024 V	24 VDC	1,440 Ω	18.0 VDC	2.4 VDC
FTR-F1 (C, A) D048 V	48 VDC	5,760 Ω	36.0 VDC	4.8 VDC

■ CHARACTERISTIC DATA

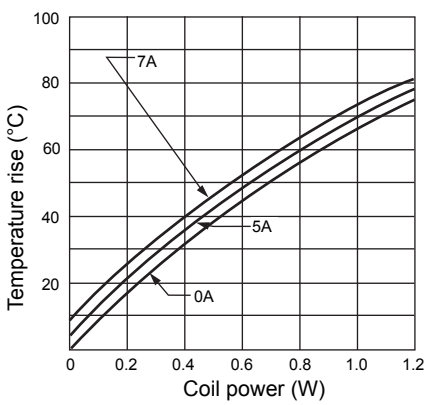
Timing



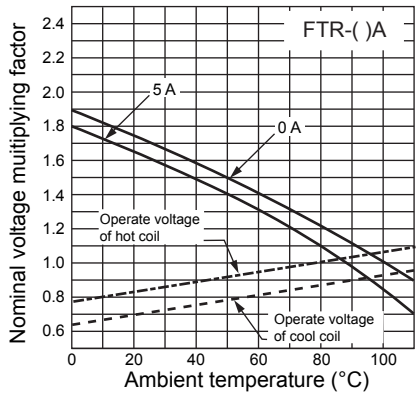
Timing



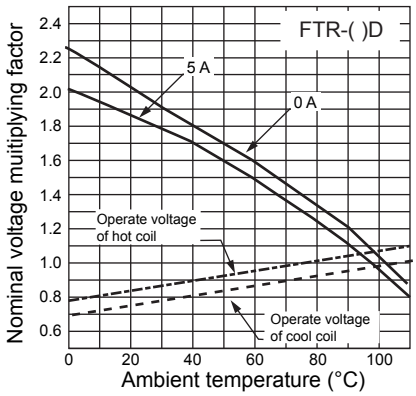
Coil temperature rise



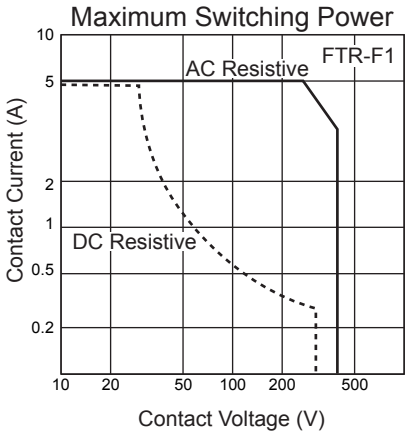
Operating range



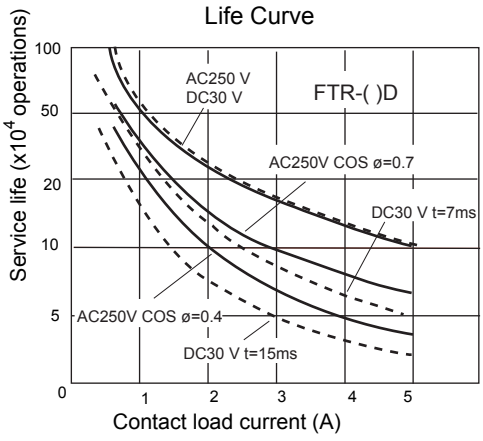
Operating range



Maximum Switching Power

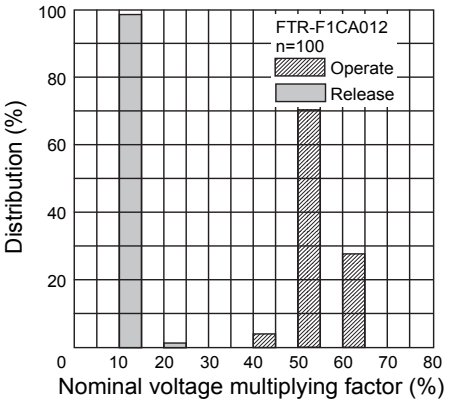


Life Curve

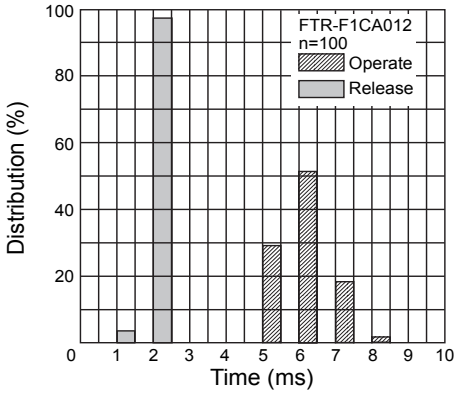


■ REFERENCE DATA

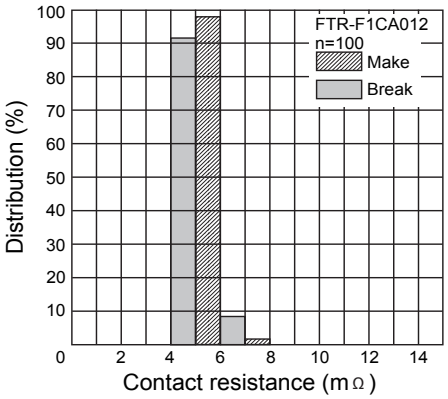
Distribution of operate and release voltage



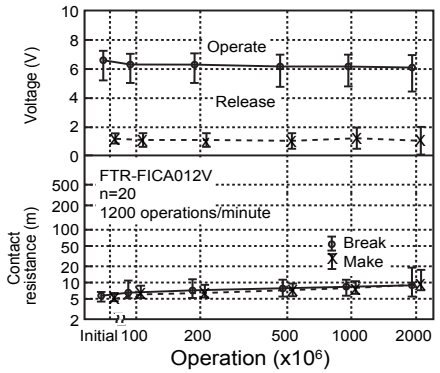
Distribution of operate and release time



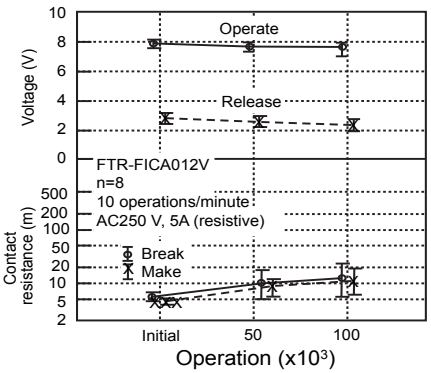
Distribution of contact resistance



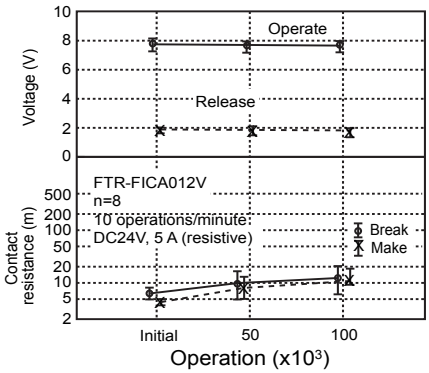
Mechanical life test



Electrical life test



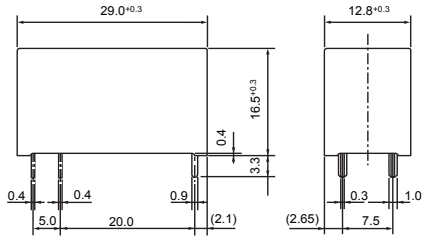
Electrical life test



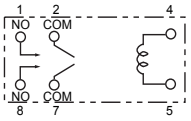
■ DIMENSIONS

● **Dimensions**

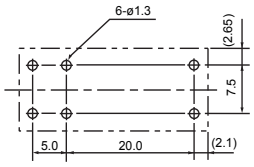
FTR-F1A type



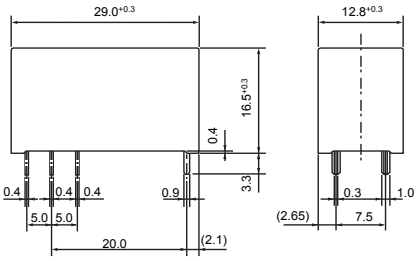
● **Schematics**
(BOTTOM VIEW)

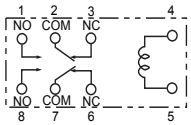


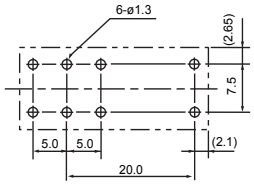
● **PC board mounting hole layout**
(BOTTOM VIEW)



FTR-F1C type







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. 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 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 condtion

Flow Solder condtion:

Pre-heating:	maximum 120˚C
Soldering:	dip within 5 sec. at 260˚C soler 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 realys.

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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