

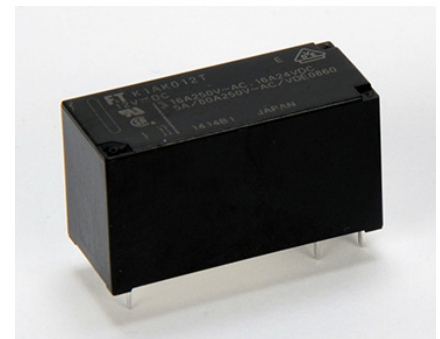
POWER RELAY

1 POLE - 12A

FTR-K1 Series

■ FEATURES

- 12A
 - 3.5mm and 5.0mm terminal pitch
 - Low profile (height: 15.7mm)
 - High insulation
Insulation distance (between coil and contacts): 10mm min.
Dielectric strength: 5KV
Surge strength: 10KV
 - Low coil power (400mW)
 - Cadmium free contacts
 - Safety standards
UL, CSA, VDE approved
 - UL F class wire insulation
 - Flux proof, RT II
 - RoHS compliant
- Please see page 7 for more information



■ PARTNUMBER INFORMATION

[Example] FTR-K1 C K 012 W - MA - BG
 (a) (b) (c) (d) (e) (f) (g)

| | | | |
|-----|-----------------------|-----------|--|
| (a) | Relay type | FTR-K1 | : FTR-K1-Series |
| (b) | Contact configuration | A C | : 1 form A (SPST-NO) : 1 form C (SPDT) |
| (c) | Coil type / enclosure | K | : Standard (400mW) / flux proof |
| (d) | Coil rated voltage | 012 | : 5.....110 VDC Coil rating table at page 3 |
| (e) | Contact material | W | : AgSnO ₂ |
| (f) | Terminal pitch | MA MB | : 3.5mm pitch : 5.0mm pitch |
| (g) | Special type | Nil BG | : Standard type (without gold plate) : Gold plated 3 μm |

Actual marking does not carry the type name : "FTR"

E.g.: Ordering code: FTR-K1CK012W-MA

Actual marking: K1CK012W-MA

■ SPECIFICATION

| Item | | | FTR-K1 (A,C) K () W-MA | FTR-K1 (A,C) K () W-MB |
|--------------|--------------------------------------|-------------------|--|-------------------------|
| Contact Data | Configuration | | 1 form A, 1 form C | |
| | Construction | | Single | |
| | Material | | W: AgSnO ₂ | |
| | Resistance (initial) | | Max. 100mΩ at 1A, 6VDC | |
| | Contact rating (resistive) | | 12A, 250VAC / 24VDC | |
| | Max. carrying current * ¹ | | 14A | |
| | Max. switching voltage | | 440VAC / 300VDC | |
| | Max. switching power | | 3,000VA / 288W | |
| | Min. switching load * ² | | 100mA, 5VDC | |
| Life | Mechanical | | Min. 20 x 10 ⁶ operations | |
| | Electrical | AC contact rating | Min. 100 x 10 ³ operations | |
| | | DC contact rating | Min. 100 x 10 ³ operations | |
| Coil Data | Rated power (20 °C) | | 400mW to 430mW | |
| | Operate power (20 °C) | | 196mW to 211mW | |
| | Operating temperature range | | -40 °C to +85 °C (no frost) | |
| Timing Data | Operate (at nominal voltage) | | Max. 15ms (without bounce) | |
| | Release (at nominal voltage) | | Max. 5ms (without bounce, no diode) | |
| Insulation | Resistance (initial) | | Min. 1,000MΩ at 500VDC | |
| | Dielectric strength | Open contacts | 1,000VAC (50/60Hz) 1min | |
| | | Contacts to coil | 5,000VAC (50/60Hz) 1min | |
| | Surge strength | Coil to contacts | 10,000V / 1.2 x 50μs standard wave | |
| | Clearance | | 10mm | |
| | Creepage | | 10mm | |
| | EN61810-1, VDE0435 | Voltage | 250V | |
| | | Pollution degree | 3 | |
| | | Material group | III a | |
| | | Category | C / 250V (Reference voltage) (VDE0110b) | |
| Other | Vibration resistance | Misoperation≥1us | 10 to 55 to 10Hz single amplitude 0.35mm | |
| | | Endurance | 10 to 55 to 10Hz single amplitude 0.75mm | |
| | Shock | Misoperation≥1us | 100m/s ² (11 ± 1ms) | |
| | | Endurance | 1,000m/s ² (6 ± 1ms) | |
| | Weight | | Approximately 13g | |
| | Sealing | | Flux proof, RTII | |

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

* 2: 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 (VDC) * | Must Release-Voltage (VDC) * | Rated Power (mW) |
|-----------|--------------------------|-------------------------------|------------------------------|------------------------------|------------------|
| 005 | 5 | 62 | 3.5 | 0.5 | 400 |
| 006 | 6 | 90 | 4.2 | 0.6 | |
| 009 | 9 | 202 | 6.3 | 0.9 | |
| 012 | 12 | 360 | 8.4 | 1.2 | |
| 018 | 18 | 810 | 12.6 | 1.8 | |
| 022 | 22 | 1,210 | 15.4 | 2.2 | |
| 024 | 24 | 1,440 | 16.8 | 2.4 | |
| 028 | 28 | 1,960 | 19.6 | 2.8 | |
| 048 | 48 | 5,360 | 33.6 | 4.8 | 430 |
| 060 | 60 | 8,570 | 42.0 | 6.0 | 420 |
| 110 | 110 | 28,800 | 77.0 | 11.0 | |

Note: All values in the table are valid for 20°C and zero contact current.

* Specified operate values are valid for pulse wave voltage.

Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

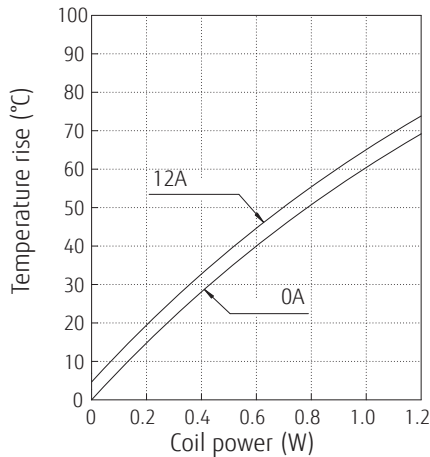
■ SAFETY STANDARDS

| Type | Compliance | Contact rating | |
|------|---|---|---|
| | | 1 Form A | 1 Form C |
| UL | UL 508 | Flammability: UL 94-V0 (plastics) | |
| | E63614 | FTR-K1AK()W-(MA, MB) 12A/16A, 24 VDC (resistive), 85°C 12/16A, 277 VAC (resistive), 85°C 1/2hp, 277VAC, 85°C 1/3hp, 125VAC, 85°C Pilot duty: B300, 85°C | FTR-K1CK()W-(MA, MB) 12A/16A, 24 VDC (resistive), 85°C 12A/16A, 277 VAC (resistive), 85°C 1/2hp, 277VAC, 85°C 1/3hp, 125VAC, 85°C 1/8hp, 125VAC, 85°C Pilot duty: B300, 85°C |
| CSA | C22.2 No. 14 LR 40304 | FTR-K1(A,C)K()W-(MA, MB) 12A, 277VAC/24VDC (resistive) 16A, 277 VAC/24VDC (resistive) 1/2 hp, 277VAC 1/3 hp, 125VAC Pilot duty: B300 | |
| VDE | IEC/EN61810-1 EN60335-1 clause 15.3; 16.3; 29.1; 29.2; 29.3 EN60730 clause 12.2; 13.2; 20.1; 20.2; 20.3 | FTR-K1(A, C) K ()W-(MA, MB) 12A, 250 VAC (cosφ=1), 85 °C 16A, 250 VAC (cosφ=1), 85 °C 12A, 24VDC (0ms), 85 °C 16A, 24VDC (0ms), 85 °C 3.5A, 250 VAC (cosφ=0.4), 85 °C | |

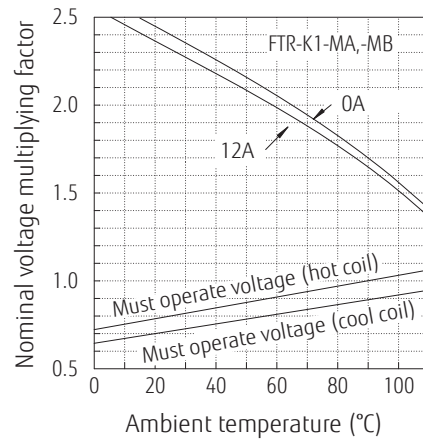
CHARACTERISTIC DATA (Reference)

* Characteristic data is not a guaranteed value, but measured values of samples from production line.

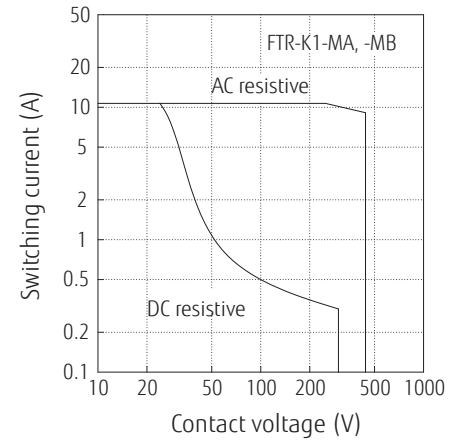
Coil temperature rise



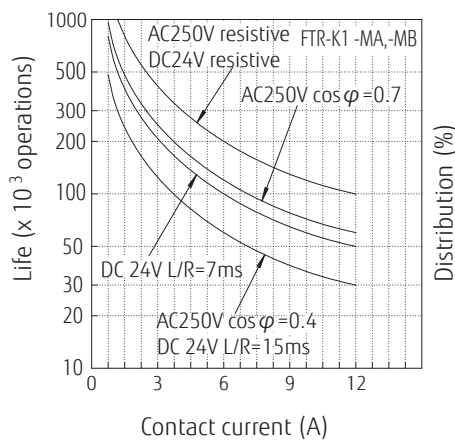
Operating range



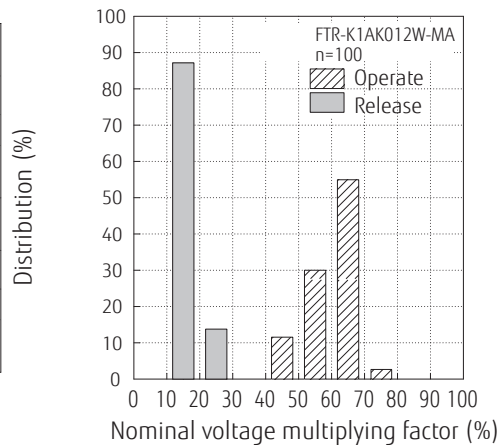
Maximum switching power



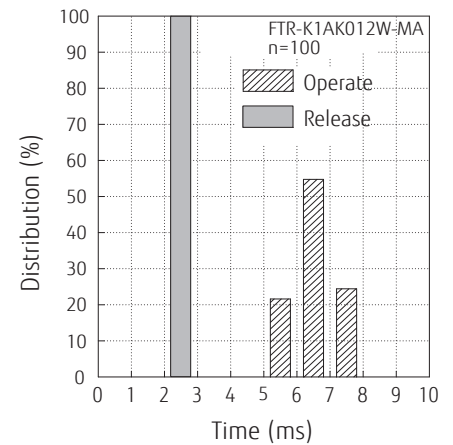
Life curve



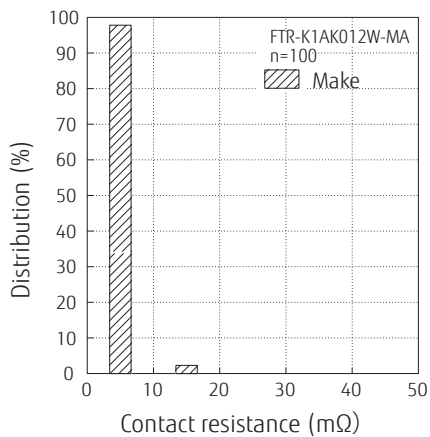
Distribution of operate, release voltage



Distribution of operate, release time



Distribution of contact resistance

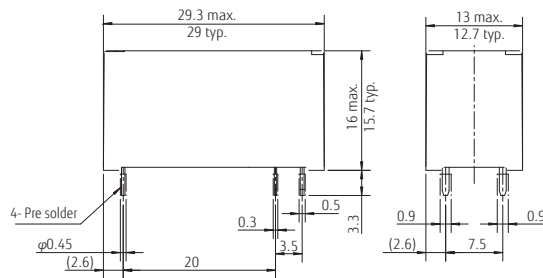


FTR-K1 SERIES

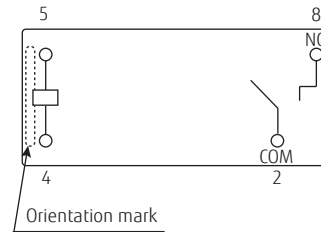
■ DIMENSIONS

FTR-K1AK()W-MA

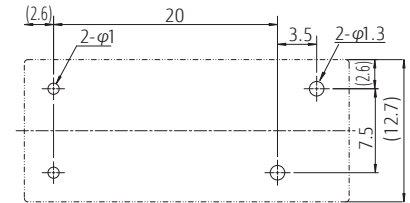
● Dimensions



● Schematics

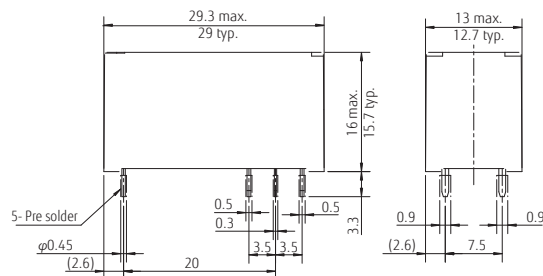


● PC board mounting hole layout (BOTTOM VIEW)

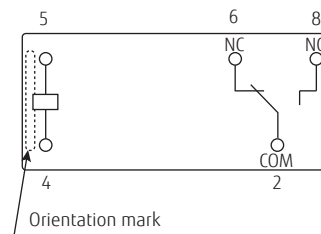


FTR-K1CK()W-MA

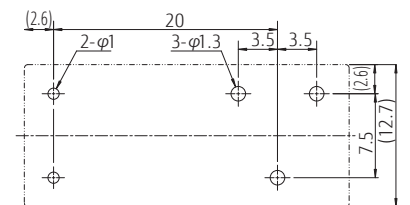
● Dimensions



● Schematics



● PC board mounting hole layout (BOTTOM VIEW)



Unit: mm

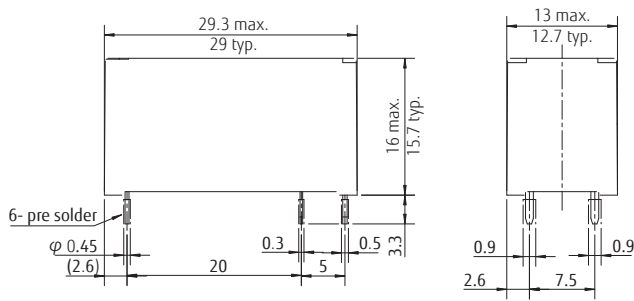
- * Dimensions of the terminals do not include thickness of pre-solder.
- * Tolerance of PC board mounting hole layout : ± 0.1 unless otherwise specified.
- * Dimensions do not include tolerances. Please ask specification in case you need tolerances.

FTR-K1 SERIES

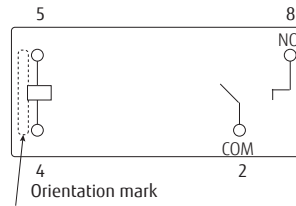
■ DIMENSIONS

FTR-K1AK()W-MB

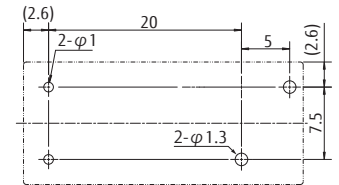
- **Dimensions**



- **Schematics**

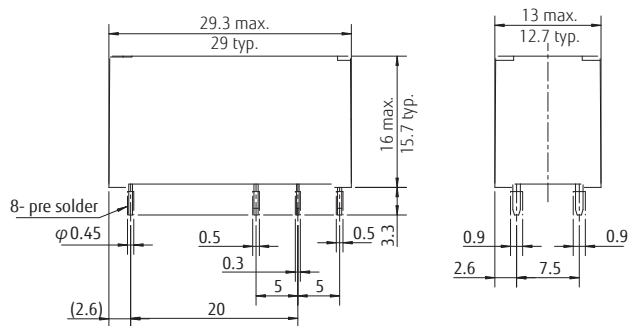


- **PC board mounting hole layout (BOTTOM VIEW)**

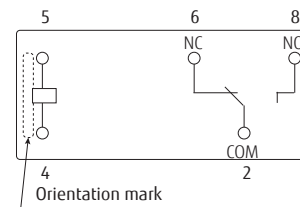


FTR-K1CK()W-MB

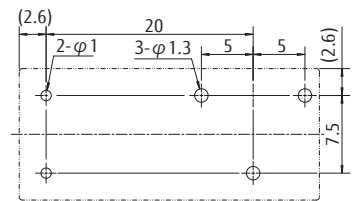
- **Dimensions**



- **Schematics**



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



Unit: mm

* Dimensions of the terminals do not include thickness of pre-solder.

* Tolerance of PC board mounting hole layout : ± 0.1 unless otherwise specified.

Cautions

- All values mentioned in this datasheet are provided under ideal conditions. Please perform the confirmation test before actual use.
- Reflow soldering is prohibited.
- Do not use relays in the atmosphere with sulfide gas, chloride gas or nitric oxide. Contact resistance may increase.
- Do not use silicon or silicon-containing product or materials near relays. It may cause contact failure.

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
within 90 sec.
Soldering: dip within 5 sec. at
255°C ± 5°C solder bath
Relay must be cooled by air immediately
after soldering

Solder by Soldering Iron:

Soldering Iron 30-60W
Temperature: maximum 350-360°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.

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