FUJITSU

AUTOMOTIVE RELAY FOR EV/PHV ON-BOARD CHARGER
1 POLE – 40A

FTR-K5 Series

RoHS Compliant

FEATURES

- 1 pole 40A, 1a contact
- 32A 250VAC switching which corresponds 6.6kW standard charger
- 40A continuous power supply
- Vibration resistance and shock resistance meet automotive relay specification standards
- Operable at up to +105℃ ambient temperature
- High insulation
  - Between coil and contact creepage distance 8.8mm
    (Conform to IEC61810-1 277V enhanced insulation)
  - Between coil and contact withstand voltage 5000 VAC
- Selectable from flux free and plastic sealed
- Plastic parts: UL flammability 94V-0
- Through hole

APPLICATIONS

EV/PHV on-board charger (standard charger AC line), Standard charger, Vehicle to Home (V2H), Package air conditioner (PAC)

PART NUMBERS

[Example] FTR-K5 A A 005 Y
(a) (b) (c) (d) (e)

(a)	Relay type	FTR-K5	: FTR-K5 series
(b)	Contact configuration	A	: 1a (1 form A)
(c)	Power consumption / Enclosure	A K	: 900mW / Plastic sealed : 900mW / Flux free
(d)	Coil voltage	Coil code	: Refer to COIL DATA
(e)	Contact material	Y :	: Silver alloy

Note: The designation name is stamped on the top of the relay case as follows:
Example: Ordering part number; FTR-K5AA005Y
Stamped on relay case: K5AA005Y

■ SPECIFICATIONS

Item			Specifications		Remarks / Conditions
			Plastic sealed	Flux free	
Contact Data	Configuration		1a (1 form A)		
	Material		Silver alloy		
	Construction		Single contact		
	Contact rating		32A 250VAC		Resistive
	Drop voltage (Initial)		Max. 0.32V		At 32A
	Resistance		Max. 10mΩ		At 32A
	Max. carrying current		40A (at 105℃, cable size 8mm^2)		At nominal voltage
	Min. switching load*		1A, 6VDC		
Coil	Rated power consumption		900mW		At 20℃
	Operate power consumption		440mW		At 20℃
	Operating temperature range		-40℃to 105℃		No frost
Time	Operate		Max. 20ms (without bounce)		At 20℃, nominal voltage
	Release		Max. 10ms (without bounce, without diode)		At 20℃, nominal voltage
Life	Mechanical		1,000,000 operations		
	Electrical		25,000 operations		Making 5A, carrying 32A, breaking 5A, 250VAC, resistive
			200,000 operations		Inrush 60A, 250VAC, interrupt 10mA, at 250VAC
			1,000 operations	30,000 operations	Making 32A, breaking 32A, 250VAC, resistive
Insulation	Insulation resistance		Min. 1,000 MΩ		500 VDC
	Dielectric withstanding voltage	Open contacts	1,000VAC (50/60Hz), 1 minute		
		Coil-contact	5,000VAC (50/60Hz), 1 minute		
Others	Vibration resistance	Misoperation	5～200 Hz, 45 m/s^2 constant acceleration		Sense time 1ms, contact ON/OFF
		Endurance	5～200 Hz, 45 m/s^2 constant acceleration		Up/down 4 hours, left/right/front/back each 2 hours, contact ON/OFF
	Shock resistance	Misoperation	100 m/s^2 (11 ms)		Sense time 1ms, contact ON/OFF
		Endurance	1000 m/s^2 (6 ms)		Contact ON/OFF total 36 times
	Dimensions / weight		18.0 x 30.5 x 29.7 mm / Approx. 39g		

Note: Electrical characteristics mentioned above are the values at JIS standard condition (temperature 15 t 35℃, relative humidity 25 to 75%, atmospheric pressure 86k to 106kPa) unless otherwise specified.

Note: Care shall be taken on the heat generated on PC board when maximum carrying current exceed 10A.

*: 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.

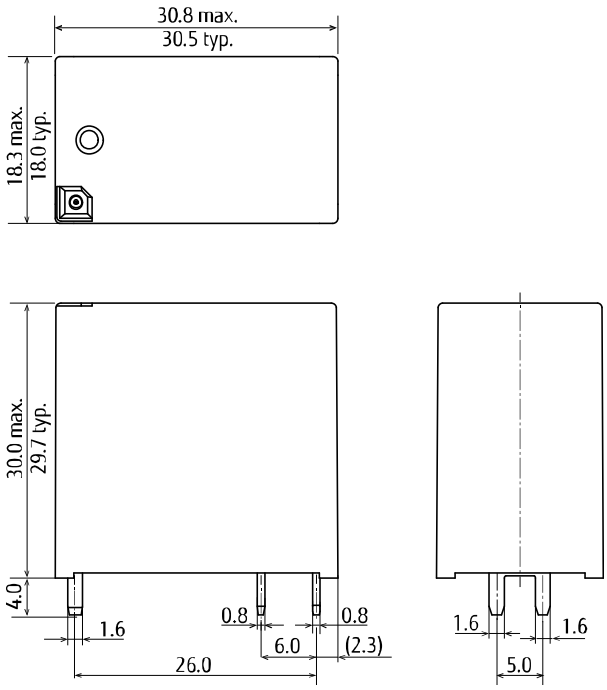
COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (VDC)	Nominal Power (mW)
005	5	28	3.5	0.25	Approx. 900
006	6	40	4.2	0.3	
012	12	160	8.4	0.6	
024	24	640	16.8	1.2	

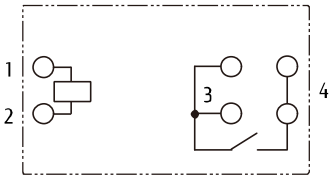
Note: All values in the table are valid at 20℃ and zero contact current unless otherwise specified.
Note: Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.
*: Specified operate values are valid for pulse wave voltage.

DIMENSIONS

● Dimensions

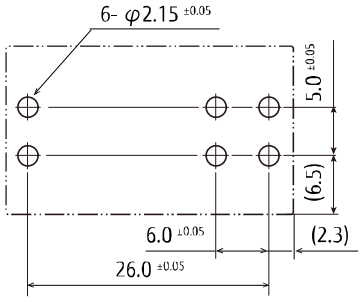


● Schematics (BOTTOM VIEW)



Two terminals of #3 shall be connected on the board and soldered respectively to guarantee carrying current performance. Ditto for #4.

● PC Board Mounting Hole Layout (BOTTOM VIEW)

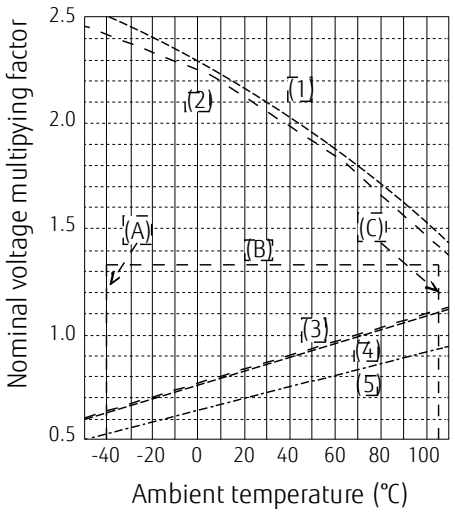


- Dimensions of the terminals do not include thickness of pre-solder.
- Dimensions do not include tolerances.

( ): Reference
Unit: mm

COIL DATA (Characteristic data is not guaranteed value but measured values of samples from production line.)

Operating range



(1) Wire temperature range: Contact current 32A
(2) Wire temperature range: Contact current 40A
(3) Must operate voltage (hot coil): Contact current 40A
(4) Must operate voltage (hot coil): Contact current 32A
(5) Must operate voltage (cool coil)
(A) Minimum allowable temperature
(B) Maximum allowable voltage
(C) Maximum allowable temperature

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.

General Information

1. RoHS Compliance

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU, including commission delegated directive 2015/863.

2. Recommended Lead Free Solder Condition

- 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.
- Recommended solder for assembly: Sn-3.0Ag-0.5Cu.

Flow Solder Condition
Pre-heating: Maximum 120℃ with 90 sec.
Soldering: Dip within 5 sec. at 255℃±5℃ solder bath
Relay must be cooled by air immediately after soldering.

Solder by Soldering Iron
Soldering Iron: 30 – 60W
Temperature: Maximum 340 – 360℃
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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