

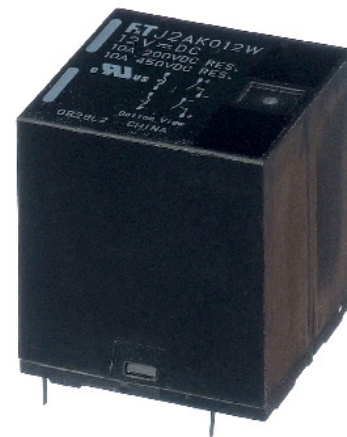
POWER RELAY

ULTRA SMALL HIGH VOLTAGE DC RELAY

FTR-J2 Series

■ FEATURES

- 10A, 450VDC high-voltage switching
(2 x 10A, 200VDC switching)
 - Contact voltage drop: typical 0.1V
 - Inrush current 150A (capacitive load)
 - Compact size (L x W X H= 24x23.5x27mm)
 - 2 x 1 form A
 - Coil sensitivity 1W (each coil connect in series)
 - High insulation between contacts and coil
 - Insulation distance : Clearance/creepage > 6mm
 - Dielectric strength : 4,000 VAC
 - Surge strength : 10,000 V (1.2 x 50μsec)
 - Plastic materials conform to UL94 flame class V-0
 - Flux proof, RTII
 - RoHS compliant
- Please see page 8 for more information



■ PARTNUMBER INFORMATION

[Example] $\frac{\text{FTR-J2}}{\text{(a)}}$ $\frac{\text{A}}{\text{(b)}}$ $\frac{\text{K}}{\text{(c)}}$ $\frac{\text{012}}{\text{(d)}}$ $\frac{\text{W}}{\text{(e)}}$

| | | | |
|-----|-----------------------|--------|--|
| (a) | Relay type | FTR-J2 | : FTR-J2-Series |
| (b) | Contact configuration | A | : 2 x 1 form A |
| (c) | Coil power | K | : Standard sensitivity |
| (d) | Coil rated voltage | 012 | : 5.....110 VDC Coil rating table at page 3 |
| (e) | Contact material | W | : Silver alloy |

Actual marking does not carry the type name : "FTR"
E.g.: Ordering code: FTR-J2AK012W Actual marking: J2AK012W

FTR-J2 SERIES

■ SPECIFICATION

| Item | | | FTR-J2 |
|--------------------------------|--|---|--------------------------------------|
| Contact Data | Configuration | | 2 x 1 form A |
| | Material | | Silver alloy |
| | Contact resistant (initial) | | Max. 100 mΩ at 1A, 6VDC |
| | Contact rating | 10A, 450VDC (resistive load) (+ polarity pin 7 and 4) * each NO contact connected in series | |
| | | 10A, 200VDC (resistive load) (single contact) + (polarity pin 7 and 4) * for each NO contact | |
| | Overload switching * | 10A, 500VDC (resistive load), 50 operations * each NO contact connected in series | |
| | | 10A, 250VDC (resistive load) * for each NO contact | |
| | Maximum carrying current | | 12A |
| | Inrush current | | Peak 150A |
| | Maximum switching voltage | 600VDC, each NO contact connection in series | |
| 300VDC, each NO contact | | | |
| Contact voltage drop (initial) | | Typical 0.1V (at nominal contact current) | |
| Life | Mechanical | | 2M operations |
| | Electrical | | 10K operations |
| Coil Data | Operate voltage (at 20 °C) | | Maximum 70% of nominal voltage |
| | Release voltage (at 20 °C) | | Minimum 5% of nominal voltage |
| | Operating temperature range (no frost) | | -40 to +85 °C |
| Timing Data | Operate (at nominal voltage) | | Max. 15ms (without bounce) |
| | Release (at nominal voltage) | | Max. 5ms (no diode) |
| Insulation | Resistance (initial) | | Min. 1000MΩ at 500VDC |
| | Dielectric strength | Between open contacts | 1,000VAC (50/60Hz) 1min |
| | | Between contact sets | 1,000VAC (50/60Hz) 1min |
| | | Between contacts and coil | 4,000 VAC (50/60 Hz) 1 min. |
| Surge strength | Coil to contacts | 10,000V/ 1.2 x 50μs standard wave | |
| Other | Vibration resistance | Misoperation | 10 to 55Hz double amplitude 1.5mm |
| | | Endurance | 10 to 55Hz double amplitude 1.5mm |
| | Shock | Misoperation | Min. 200m/s ² (11 ± 1ms) |
| | | Endurance | Min. 1,000m/s ² (6 ± 1ms) |
| | Weight | | Approximately 26g |
| | Sealing | | Flux proof RTII |

Note: Use a varistor as a protective circuit against reverse surge connected parallel to the coil. The reverse blocking voltage should be about 3 times the value of the power source voltage.

* 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.

FTR-J2 SERIES

■ COIL RATING

Standard single coil

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) * | Must Operate Voltage (VDC) * | Must Release Voltage (VDC) * | Rated Power (W) (±10%) |
|-----------|--------------------------|---------------------------------|------------------------------|------------------------------|------------------------|
| 005 | 5 | 47 | 3.5 | 0.25 | Approximately 0.53 |
| 006 | 6 | 68 | 4.2 | 0.3 | |
| 012 | 12 | 270 | 8.4 | 0.6 | |
| 024 | 24 | 1,100 | 16.8 | 1.2 | |
| 048 | 48 | 4,400 | 33.6 | 2.4 | |
| 060 | 60 | 6,790 | 42 | 3 | |
| 110 | 110 | 22,800 | 77 | 5.5 | |

2 coils in series (Connect relay coil terminal No.2 to No.3) See note 2.

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) * | Must Operate Voltage (VDC) * | Must Release Voltage (VDC) * | Rated Power (W) (±10%) |
|-----------|--------------------------|---------------------------------|------------------------------|------------------------------|------------------------|
| 005 | 10 | 94 | 7 | 0.5 | Approximately 1.06 |
| 006 | 12 | 136 | 8.4 | 0.6 | |
| 012 | 24 | 540 | 16.8 | 1.2 | |
| 024 | 48 | 2,200 | 33.6 | 2.4 | |
| 048 | 96 | 8,800 | 67.2 | 4.8 | |
| 060 | 120 | 13,580 | 84 | 6 | |
| 110 | 220 | 45,600 | 154 | 11 | |

2 coils in parallel (Connect relay coil terminal No.1 to No.3 and No.2 to No.4)

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) * | Must Operate Voltage (VDC) * | Must Release Voltage (VDC) * | Rated Power (W) (±10%) |
|-----------|--------------------------|---------------------------------|------------------------------|------------------------------|------------------------|
| 005 | 5 | 23.5 | 3.5 | 0.25 | Approximately 1.06 |
| 006 | 6 | 34 | 4.2 | 0.3 | |
| 012 | 12 | 135 | 8.4 | 0.6 | |
| 024 | 24 | 550 | 16.8 | 1.2 | |
| 048 | 48 | 2,200 | 33.6 | 2.4 | |
| 060 | 60 | 3,395 | 42 | 3 | |
| 110 | 110 | 11,400 | 77 | 5.5 | |

Note 1: All values in the tables are valid for 20°C and zero contact current.

Note 2: Nominal voltage is different from indication of part number. Please refer to the coil rating chart "single coil (10A, 200VDC configuration)" for single coil configuration data.

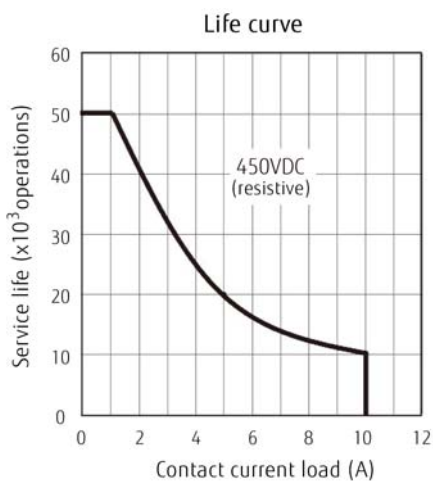
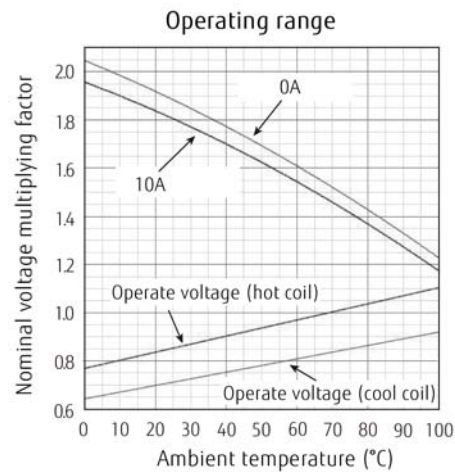
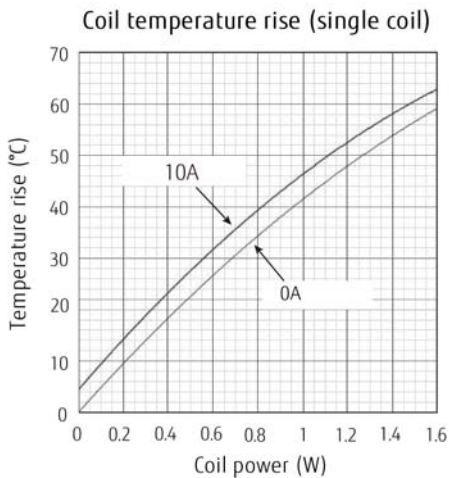
Note 3: Please use with nominal voltage. When energizing higher voltage to coil, please refer to characteristic data "coil temperature rise" and "operating range" (page 4) to set suitable voltage.

* Specified operate values are valid for pulse wave voltage.

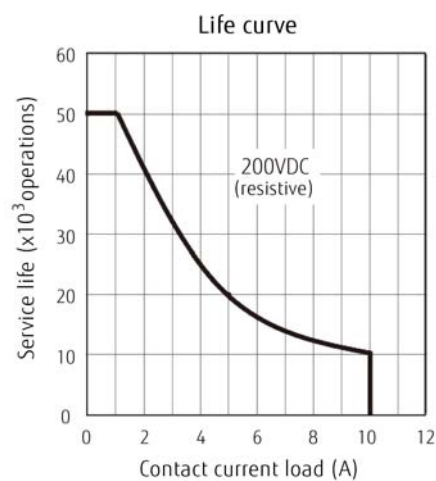
■ SAFETY STANDARDS

| Type | Compliance | Contact rating |
|------|------------|---|
| UL | UL 508 | 10A, 450VDC, resistive, 10,000 cycles for series connection of each NO contact 10A, 400VDC, resistive, 10,000 cycles for series connection of each NO contact 10A, 200VDC, resistive, 10,000 cycles for each NO contact |
| VDE | 0435 | 10A, 400VDC, resistive, 10,000 cycles for series connection of each NO contact 10A, 200VDC, resistive, 10,000 cycles for each NO contact |

■ CHARACTERISTIC DATA



* Each NO contact connect in series

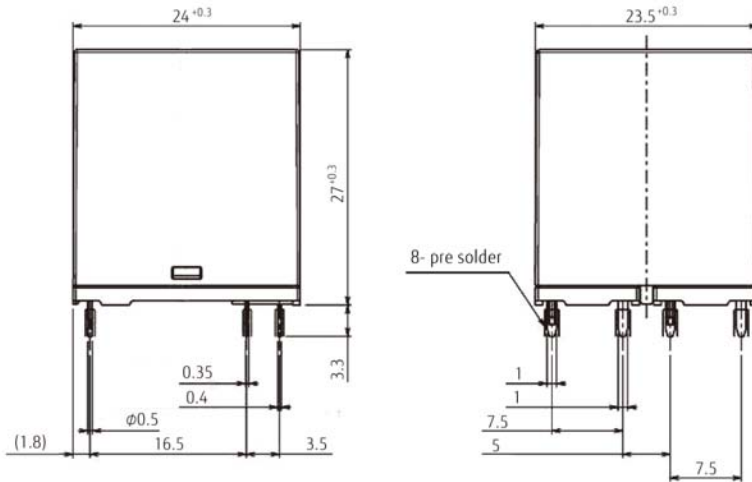


* Each NO contact

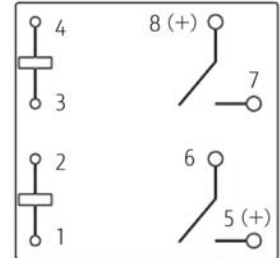
FTR-J2 SERIES

■ DIMENSIONS

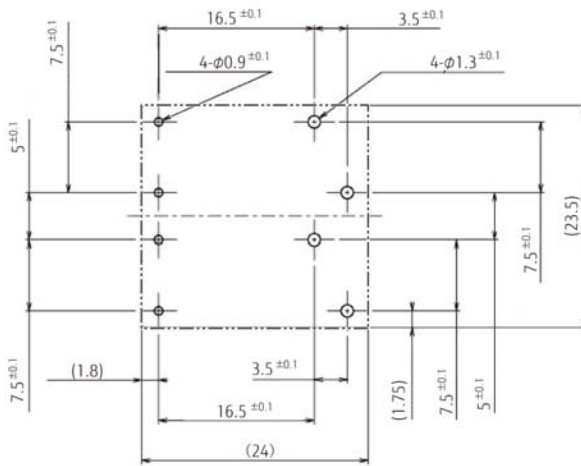
● Dimensions



● Schematics (BOTTOM VIEW)



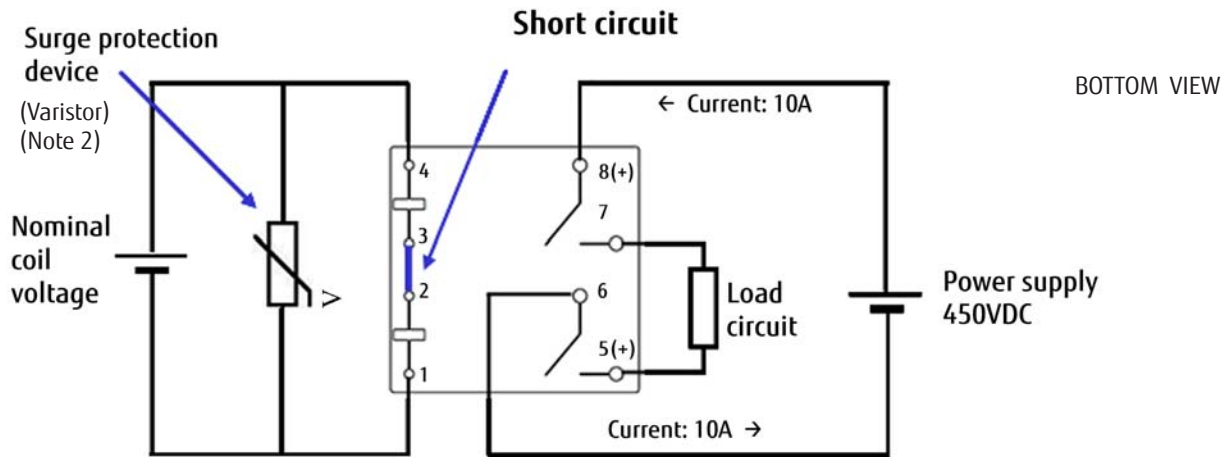
● PC board mounting hole layout (BOTTOM VIEW)



Unit: mm

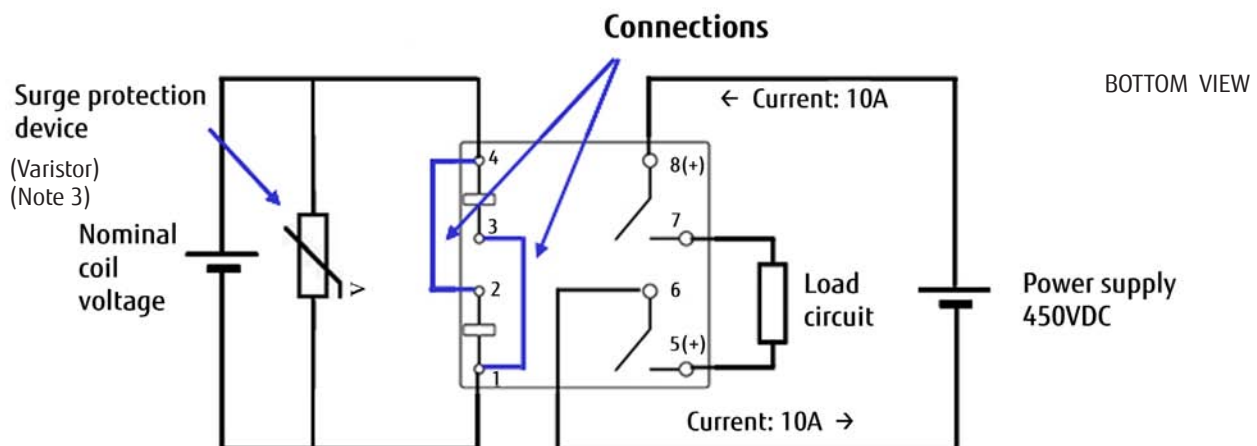
■ CIRCUIT

- **Load circuit and input circuit (coil sides) for 10A, 450VDC**
2 coils connect in series



Load circuit contact terminals have polarities (+) and (-). Coils do not have polarity.

- **Load circuit and input circuit (coil sides) for 10A, 450VDC**
2 coils connect in parallel



Note 1: In case 2 coils are connected in series, connect coil terminal #2 to #3 on PCB circuit. In case 2 coils are connected in parallel, connect coil terminal #1 to #3 and connect coil terminal #2 to #4 on PCB. Regarding terminal number, refer to schematics data.

Note 2: Please use varistor as surge protection device. If varistor will not be used, the electrical life need to be derated.

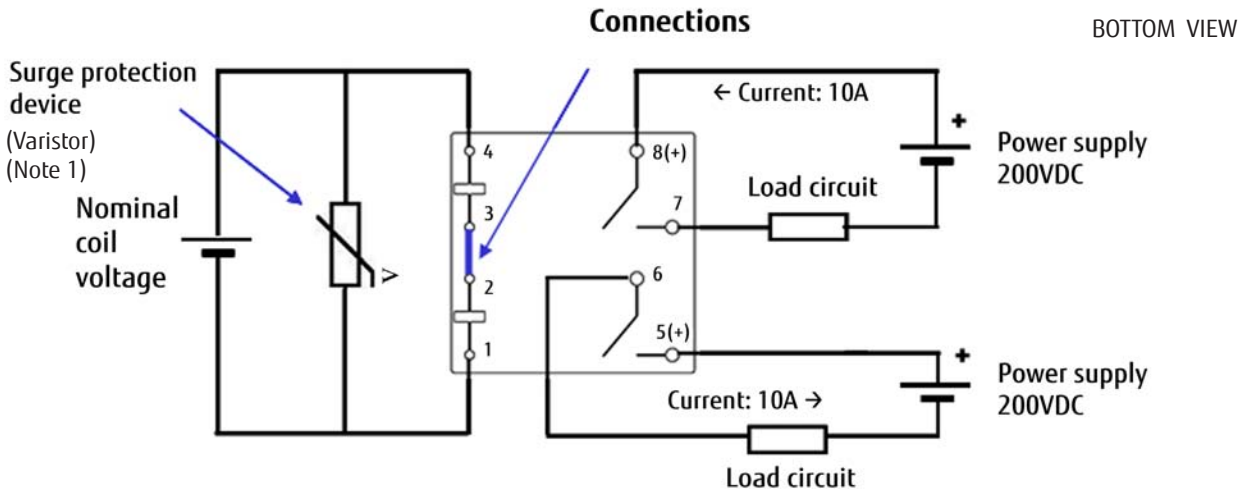
Note 3: Varistor surge protection device should be connect parallel to coil(s). Suitable voltage of varistor is 3 times the coil voltage.

Note 4: For max. contact life and correct functioning of the relay, positive polarity of load should be connected to pin 8 and pin 5. If not, damage to the relay can occur.

Warning: At current loads at max. switching capacity 10A (450VDC) correct polarity is vital for the correct and safe functioning of the relay.

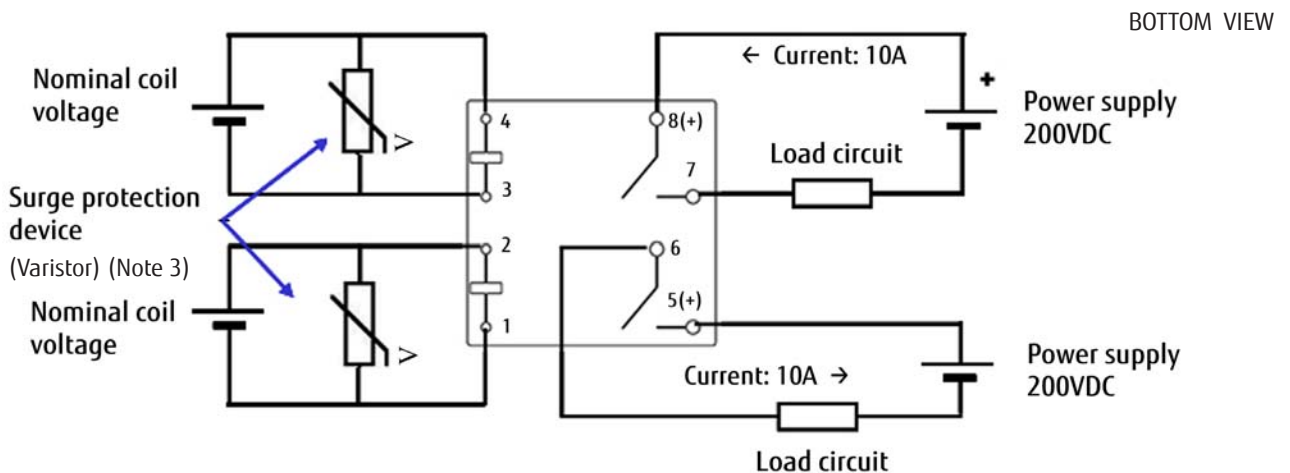
■ CIRCUIT

- **Load circuit and input circuit (coil sides) for 10A, 200VDC (dual circuits)**
2 coils connect in series



Load circuit contact terminals have polarities (+) and (-). Coils have no polarity.

- **Load circuit and input circuit (coil sides) for 10A, 200VDC (dual circuits)**



Note 1: In case 2 coils are connected in series, connect coil terminal #2 to #3 on PCB circuit. In case 2 coils are connected in parallel, connect coil terminal #1 to #3 and connect coil terminal #2 to #4 on PCB. Regarding terminal number, refer to schematics data.

Note 2: Please use varistor as surge protection device. If varistor will not be used, the electrical life need to be derated.

Note 3: Varistor surge protection device should be connect parallel to coil(s). Suitable voltage of varistor is 3 times the coil voltage.

Note 4: For max. contact life and correct functioning of the relay, positive polarity of load should be connected to pin 8 and pin 5. If not, damage to the relay can occur.

Warning: At current loads at max. switching capacity 10A (200VDC) correct polarity is vital for the correct and safe functioning of the relay.

RoHS Compliance and Lead Free Information

1. General Information

- All signal and power relays produced by Fujitsu Components are compliant with RoHS directive 2002/95/EC including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives on October 21st, 2005. (Amendment to Directive 2002/95/EC)
- All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info for older date codes at: <http://www.fujitsu.com/us/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 Profile

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

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, 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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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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