FUJITSU

# MINIATURE RELAY

## 2 POLES - 1 to 2 A (For Signal Switching)

# NA Series

### ■ FEATURES

- Slim type relay for high density mounting
- Conforms to Telcordia specification and FCC Part 68
  - Dielectric strength 1,500 VAC between coil and contacts
  - Surge strength 2,500 V between coil and contacts (at 2 × 10 s surge wave)
- UL, CSA recognized
- High sensitivity and low consumption power
- High reliability - bifurcated contacts
- DIL pitch terminals
- Plastic sealed type
- RoHS compliant.

Please see page 8 for more information

### ■ PARTNUMBER INFORMATION

| | NA | L | - | D | 12 | W | - | K |
|---|---|---|---|---|---|---|---|---|
| [Example] | (a) | (b) | (*) | (c) | (d) | (e) | | (f) |

| | | | |
|---|---|---|---|
| (a) | Relay type | NA | : NA Series |
| (b) | Coil type | Nil<br>L | : Standard type<br>: Latching type |
| (c) | Number of coil | Nil<br>D | : Single winding type<br>: Double winding type |
| (d) | Coil rated voltage | 12 | : 1.5....48VDC<br>Coil rating table at page 3 |
| (e) | Contact style | W | : Bifurcated type |
| (f) | Enclosure | K | : Plastic sealed |

Note: Actual marking omits the hyphen ( - ) of (*).

## ■ SPECIFICATION

| Item | | | Standard type | Single winding latching type | Double winding latching type |
|---|---|---|---|---|---|
| | | | NA - ( ) W - K | NAL - ( ) W - K | NAL-D ( ) W - K |
| Contact Data | Configuration | | 2 form C (DPDT) | | |
| | Construction | | Bifurcated | | |
| | Material | | Gold overlay silver alloy (AgPd) | | |
| | Resistance (Initial) | | Max. 50 mΩ at 1 A, 6 VDC | | |
| | Contact rating (resistive) | | 0.5A, 125VAC or 1A, 30VDC | | |
| | Max. carrying current | | 2A | | |
| | Max. switching voltage | | 250VAC / 220VDC | | |
| | Max. switching power | | 62.5 AV / 30W | | |
| | Max. switching current | | 2A | | |
| | Min. switching load * | | 0.01 mA, 10 mVDC | | |
| | Capacitance | | Approx. 0.5 pF (open contacts, adjacent contacts)<br>Approx. 1.0 pF (between coil and contacts) | | |
| Life | Mechanical | | Min. 100 x $10^6$ operations | Min. 10 x $10^6$ operations | |
| | Electrical | | Min. 200 x $10^3$ operations (0.5A, 125VAC),<br>Min. 500 x $10^3$ operations (1A, 30VDC) | | |
| Coil Data | Rated power | | 140 - 300 mW | 100 - 150 mW | 200 - 300 mW |
| | Operate power | | 80 - 70 mW | 60 - 85 mW | 115 - 170 mW |
| | Operating temperature range | | -40 °C to +85 °C (no frost) | | |
| Timing Data | Operate (at nominal voltage) | | Max. 6 ms | Max. 6 ms (set) | |
| | Release (at nominal voltage) | | Max. 4 ms | Max. 6 ms (reset) | |
| Insulation | Resistance (Initial) | | Min. 1,000MOhm at 500VDC | | |
| | Dielectric strength | Open contacts / adjacent contacts | 1,000VAC (50/60Hz) 1min | | |
| | | Contacts to coil | 1,500VAC (50/60Hz) 1min. | | 1,000VAC (50/60Hz) 1min |
| | Surge strength | Open contacts / adjacent contacts | 1,500V / 10 x 700μs standard wave | | |
| | | Coil to contacts | 2,500V / 2 x 10μs standard wave | | 1,500V / 10 x 160μs standard wave |
| Other | Vibration resistance | Misoperation | 10 to 55Hz double amplitude 3.3mm | | |
| | | Endurance | 10 to 55Hz double amplitude 5.0mm | | |
| | Shock | Misoperation | 500m/s² (11 ± 1ms) | | |
| | | Endurance | 1,000m/s² (6 ± 1ms) | | |
| | Weight | | Approximately 1.5 g | | |

* 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

Standard type

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) | Must Operate Voltage (VDC) * | Must Release-Voltage (VDC) * | Max. Coil Voltage (VDC) | Rated Power (mW) |
|---|---|---|---|---|---|---|
| 1.5 | 1.5 | 16.1 | +1.13 | +0.15 | 3.6 | 140 |
| 3 | 3 | 64.3 | +2.25 | +0.3 | 7.2 | |
| 4.5 | 4.5 | 145 | +3.38 | +0.45 | 10.8 | |
| 5 | 5 | 178 | +3.75 | +0.5 | 12.0 | |
| 6 | 6 | 257 | +4.5 | +0.6 | 14.4 | |
| 9 | 9 | 579 | +6.75 | +0.9 | 21.6 | |
| 12 | 12 | 1,028 | +9 | +1.2 | 28.8 | |
| 18 | 18 | 1,620 | +13.5 | +1.8 | 36.0 | 200 |
| 24 | 24 | 2,880 | +18 | +2.4 | 48.0 | |
| 48 | 48 | 7,680 | +36 | +4.8 | 84.0 | 300 |

Single winding latching type

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) | Set Voltage (VDC) * | Reset Voltage (VDC) * | Rated Power (mW) |
|---|---|---|---|---|---|
| 1.5 | 1.5 | 22.5 | +1.13 | -1.13 | 100 |
| 3 | 3 | 90 | +2.25 | -2.25 | |
| 4.5 | 4.5 | 203 | +3.38 | -3.38 | |
| 5 | 5 | 250 | +3.75 | -3.75 | |
| 6 | 6 | 360 | +4.5 | -4.5 | |
| 9 | 9 | 810 | +6.75 | -6.75 | |
| 12 | 12 | 1,440 | +9 | -9 | |
| 18 | 18 | 2,160 | +13.5 | -13.5 | 150 |
| 24 | 24 | 3,840 | +18 | -18 | |

Note: All values in the table are valid for 20°C and zero contact current.
* Specified operate values are valid for pulse wave voltage.

## ■ COIL RATING

Double winding latching type

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance +/- 10% (Ohm) | Set Voltage (VDC) * | Reset Voltage (VDC) * | Rated Power (mW) |
|---|---|---|---|---|---|
| 1.5 | 1.5 | P 11.25 | +1.13 | | 200 |
| | | S 11.25 | | +1.13 | |
| 3 | 3 | P 45 | +2.25 | | |
| | | S 45 | | +2.25 | |
| 4.5 | 4.5 | P 101 | +3.38 | | |
| | | S 101 | | +3.38 | |
| 5 | 5 | P 125 | +3.75 | | |
| | | S 125 | | +3.75 | |
| 6 | 6 | P 180 | +4.5 | | |
| | | S 180 | | +4.5 | |
| 9 | 9 | P 405 | +6.75 | | |
| | | S 405 | | +6.75 | |
| 12 | 12 | P 720 | +9 | | |
| | | S 720 | | +9 | |
| 18 | 18 | P 1,080 | +13.5 | | 300 |
| | | S 1,080 | | +13.5 | |
| 24 | 24 | P 1,920 | +18 | | |
| | | S 1,920 | | +18 | |

Note: All values in the table are measured at 20°C and zero contact current. P: Primary coil S: Secondary coil
* Specified values are measured with pulse wave voltage

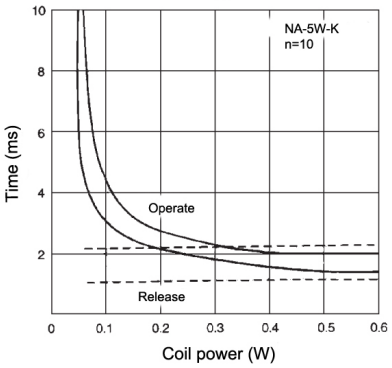
## ■ SAFETY STANDARDS

| Type | Compliance | Contact rating |
|---|---|---|
| UL | UL 508, UL 1950<br><br>E 45026 | Flammability: UL 94-V0 (plastics)<br>0.5A, 125VAC (general use)<br>2A, 30VDC (resistive)<br>0.3A, 110VDC (resistive) |
| CSA | C22.2 No. 14, No. 950<br>LR 35579 | |

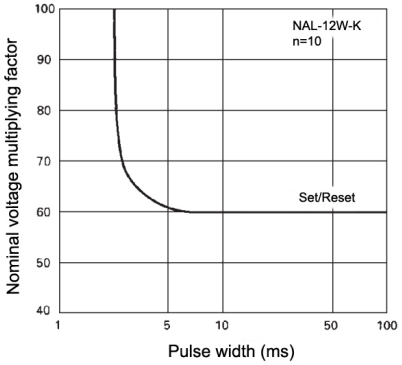
Complies to IEC60950-1; FCC part 68: Telcordia
(Relay is only marked with UL and CSA logo)

## ■ CHARACTERISTIC DATA

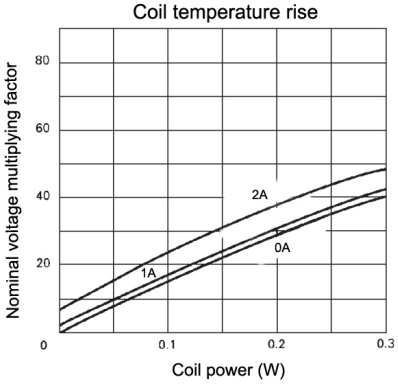
Timing



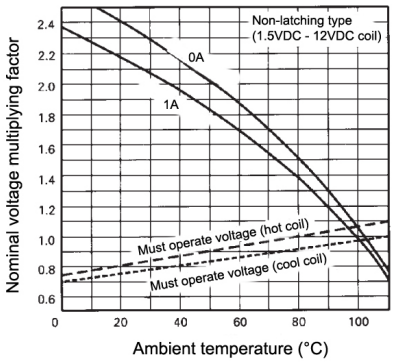

Pulse Characteristics (Latching type)



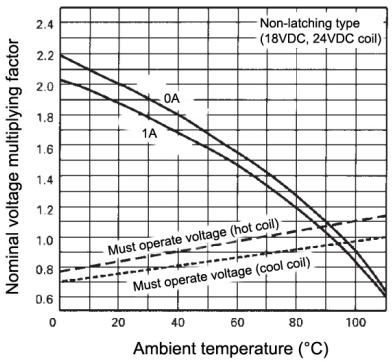

Coil temperature rise



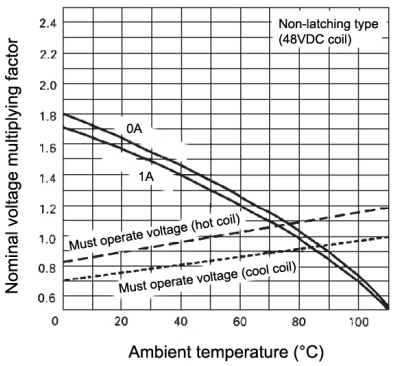

Operating range



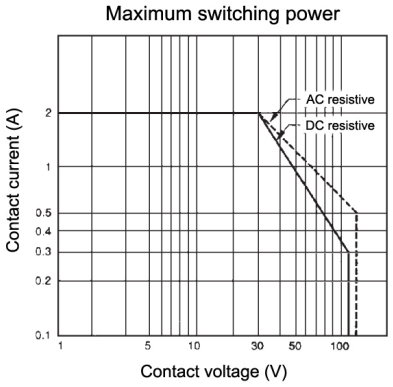

Operating range



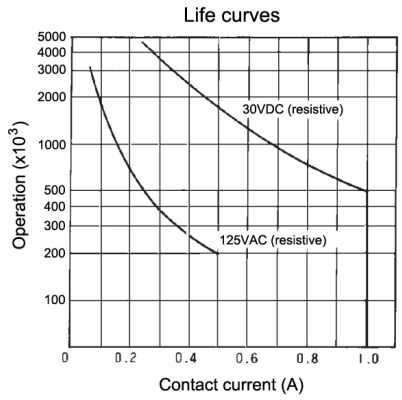

Operating range



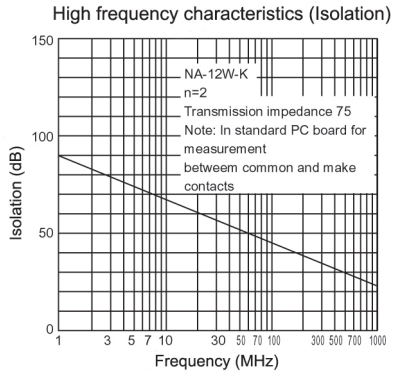

Maximum switching power



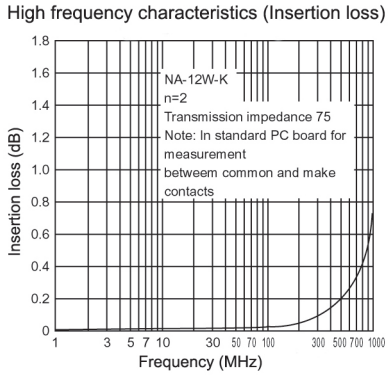

Life curves




High frequency characteristics (Isolation)

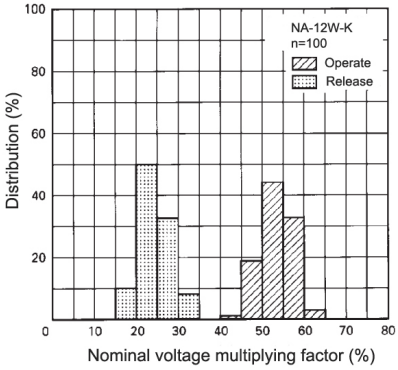



High frequency characteristics (Insertion loss)

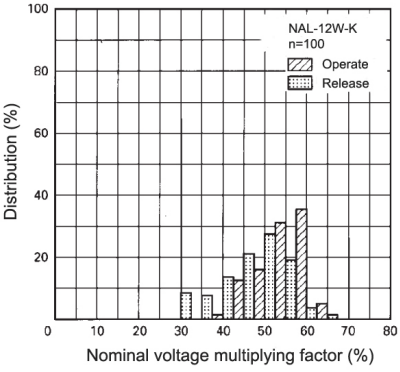


## ■ REFERENCE DATA

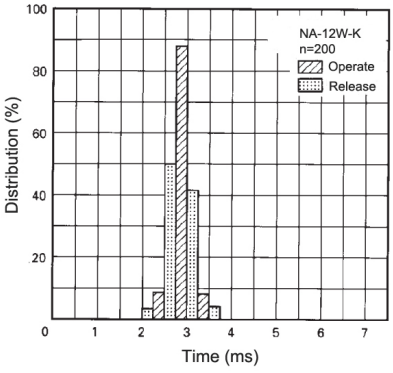
Distribution of operate & release voltage



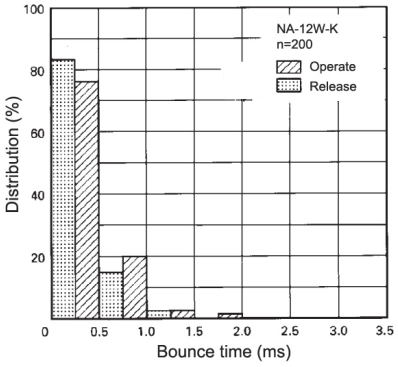

Distribution of set & reset voltage



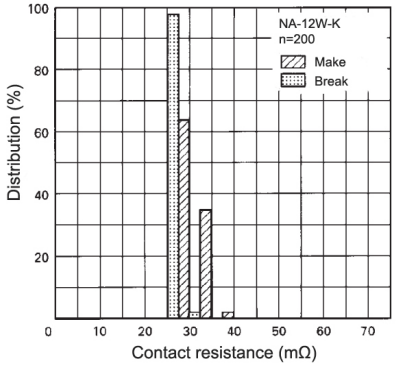

Distribution of operate & release time



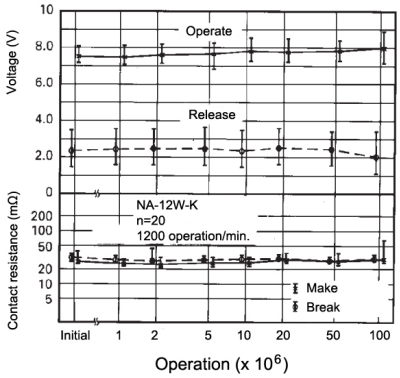

Distribution of bounce time



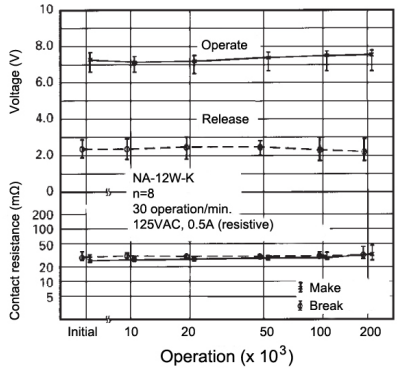

Distribution of contact resistance



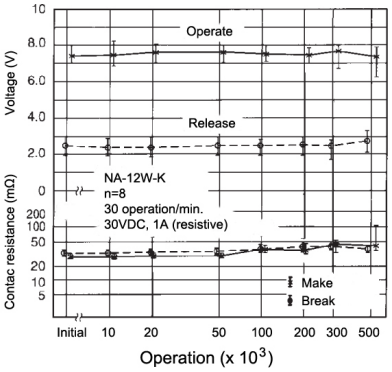

Mechanical life test



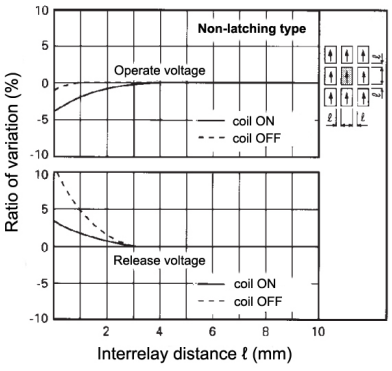

Electrical life test



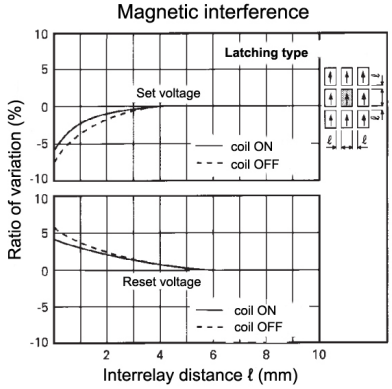

Electrical life test




Magnetic interference



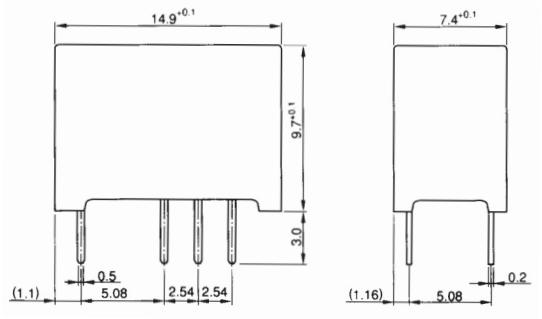

Magnetic interference



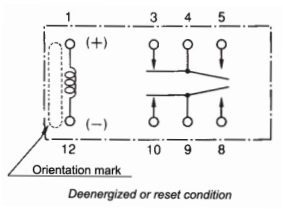
## ■ DIMENSIONS

- **Dimensions**

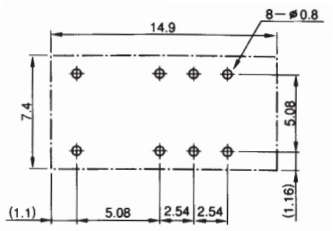
NA, NAL (Standard type, Single winding latching type)



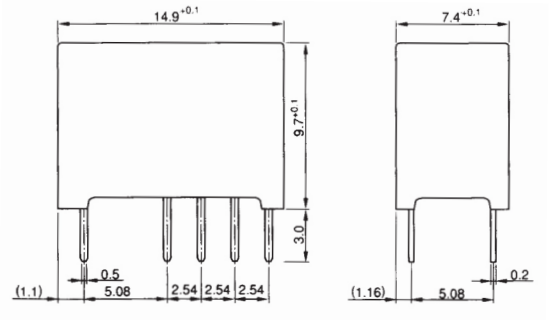

- Schematics (BOTTOM VIEW)

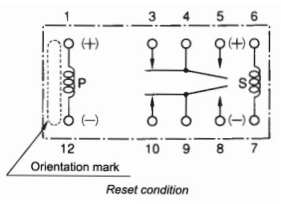


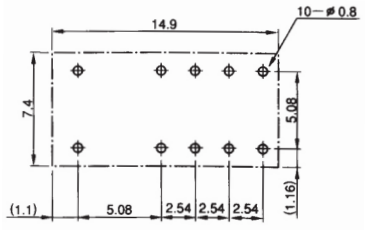

- **PC board mounting hole layout** (BOTTOM VIEW)




NAL-D (Double winding latching type)




Unit: mm

# RoHS Compliance and Lead Free Information

## 1. General Information

- All signal and power relays produced by Fujitsu Components are compliant with RoHS directive 2002/95EC 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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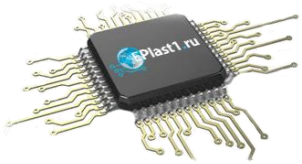
Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

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