# 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 L	: Standard type : Latching type (1 coil)
(c)	Number of coil	Nil D	: Single winding type : Double winding type
(d)	Coil rated voltage	12	: 1.548 VDC Coil rating table at page 3
(e)	Contact	W	: Bifurcated type
(f)	Enclosure	К	: Plastic sealed type

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

## SPECIFICATION

ltem			Standard type	Single winding latching type	Double winding latching type	
			NA - ( ) W - K	NAL - ( ) W - K	NAL-D ( ) W - K	
Contact Data	act Data Configuration		2 form C (DPDT)			
	Construction		Bifurcated			
	Material		Gold overlay silver alloy (AgPd)			
	Resistance (Initial)		Max. 50 m $\Omega$ at 1	A, 6 VDC		
	Contact rating (resistive)		0.5A, 125VAC or 1	1A, 30VDC		
	Max. carrying current		2A			
	Max. switching voltage		250VAC / 220VDC			
	Max. switching power		62.5VA/30W			
	Max. switching current		2A			
	Min. switching load *		0.01 mA, 10 mVD	C		
	Capacitance (at 1kHz, refe	erence)		pen contacts, adjao etween coil and co		
Life	Mechanical		Min. 100 x 10 <sup>6</sup> operations Min. 10 x 10 <sup>6</sup> operations		erations	
	Electrical		Min. 200 x 10 <sup>3</sup> operations (0.5A, 125VAC), Min. 500 x 10 <sup>3</sup> operations (1A, 30VDC)			
Coil Data	Rated power		140 - 300 mW	100 - 150 mW	200 - 300 mW	
	Applied pulse width			min. 10ms		
	Operate power		80 - 70 mW	60 - 85 mW	115 - 170 mW	
	Operating temperature rai	nge	-40 °C to +85 °C (no frost)			
Timing Data	Operate (at nominal volta	ge, without bounce)	Max. 6 ms	Max. 6 ms (set)		
	Release (at nominal volta	ge, without bounce)	Max. 4 ms	Max. 6 ms (reset)		
Insulation	Resistance (Initial)		Min. 1,000MΩ at	500VDC		
	Dialactric strep ath	Open contacts / adjacent contacts	1,000VAC (50/60Hz) 1min			
	Dielectric strength	Contacts to coil	1,500VAC (50/60Hz) 1min. 1,000VAC (5 1min		1,000VAC (50/60Hz) 1min	
		Open contacts / adjacent contacts	1,500V / 10 x 700µs standard wave			
	Surge strength	Coil to contacts			1,500V / 10 x 160µs standard wave	
Other	Misoperation		10 to 55 to 10Hz single amplitude 1.65mm			
	Vibration resistance	Endurance	10 to 55 to 10Hz single amplitude 2.5mm			
	Charle	Misoperation	500m/s <sup>2</sup> (11 ± 1ms)			
	Shock Endurance		1,000m/s <sup>2</sup> (6 ± 1ms)			
	Weight		Approximately 1.6 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) *	Rated Power (mW)
1.5	1.5	16.1	+1.13	+0.15	
3	3	64.3	+2.25	+0.3	
4.5	4.5	145	+3.38	+0.45	
5	5	178	+3.75	+0.5	140
6	6	257	+4.5	+0.6	
9	9	579	+6.75	+0.9	
12	12	1,028	+9	+1.2	
18	18	1,620	+13.5	+1.8	200
24	24	2,880	+18	+2.4	200
48	48	7,680	+36	+4.8	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	
3	3	90	+2.25	-2.25	
4.5	4.5	203	+3.38	-3.38	100
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	150

Note: All values in the tables 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.

#### **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		
		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	200
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		
		S 1,080		+13.5	300
24	24	P 1,920	+18		
		S 1,920		+18	

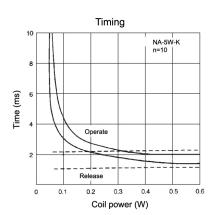
Note: All values in the table are measured at 20°C and zero contact current. P: Primary coil S: Secondary coil \* Specified values are measured with pulse wave voltage Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

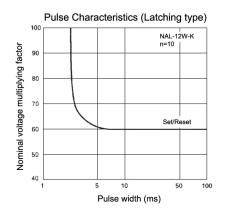
#### SAFETY STANDARDS

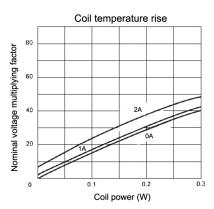
Туре	Compliance	Contact rating
UL	UL 508, UL 1950	Flammability: UL 94-V0 (plastics)
	E 45026	0.5A, 125VAC (general use) 2A, 30VDC (resistive)
CSA	C22.2 No. 14, No. 950 LR 35579	0.3A, 110VDC (resistive)

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

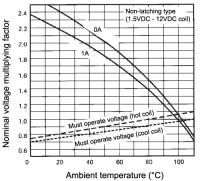
CHARACTERISTIC DATA

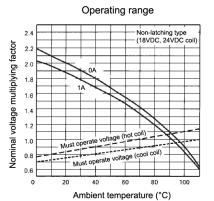




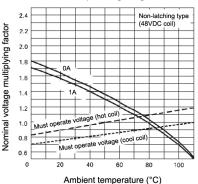


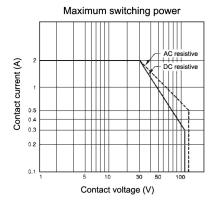
Operating range



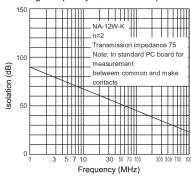


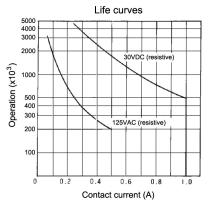
Operating range



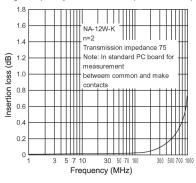


High frequency characteristics (Isolation)

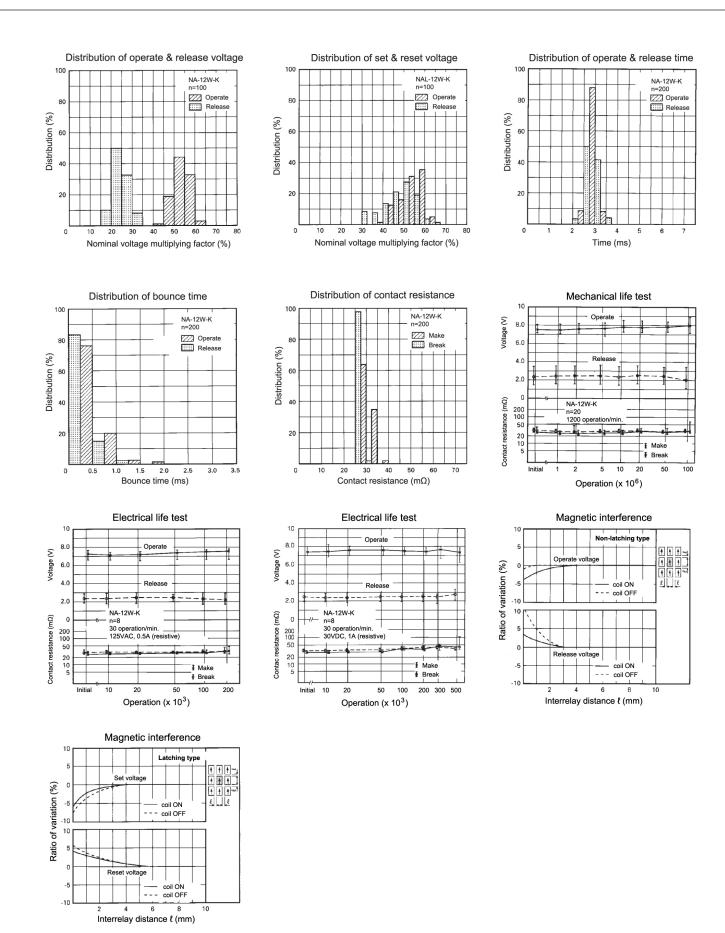




High frequency characteristics (Insertion loss)



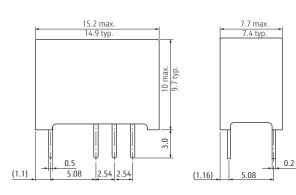
## **NA SERIES**

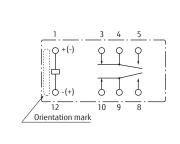


#### DIMENSIONS

NA (standard type) NAL (single winding latching type)

#### Dimensions

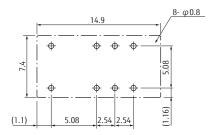




**Schematics** 

(BOTTOM VIEW)

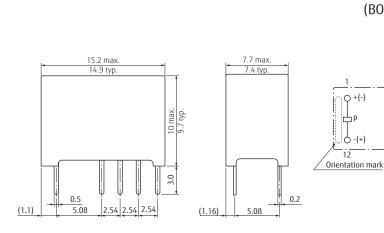
PC board mounting hole layout (BOTTOM VIEW)



NAL-D (double winding latching type)

Dimensions

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**Schematics** (BOTTOM VIEW)

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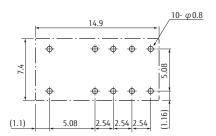
10 9 8

+(-)

ЬΡ 6 -(+)

12

PC board mounting hole layout (BOTTOM VIEW)



\* Contacts drawn in reset condition.

\* +/-: set voltage applied polarity, (+)/(-): reset voltage applied polarity.

\* P: Set coil, S: Reset coil

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

\* Dimensions do not include tolerances.

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

Unit: mm

## **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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