

# MINIATURE RELAY

## 2 POLES—1 to 2 A (FOR SIGNAL SWITCHING)

### NA SERIES

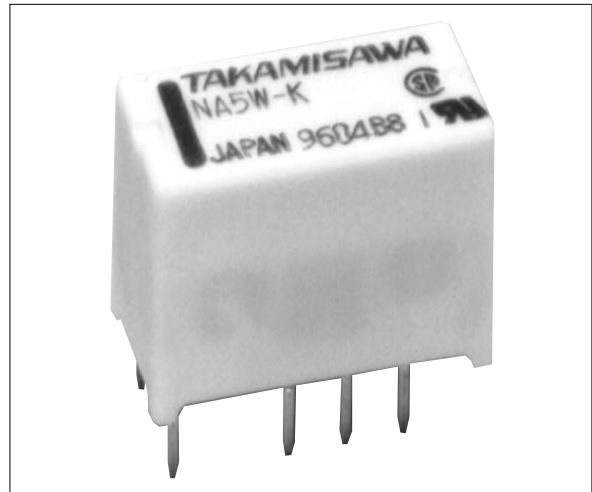
RoHS compliant



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#### ■ FEATURES

- Slim type relay for high density mounting
- Conforms to Bellcore 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)
- Maximum switching capability - 4.2A, 700VAC
- UL, CSA recognized
- High sensitivity and low consumption power
- High reliability—bifurcated contacts
- DIL pitch terminals
- Plastic sealed type
- RoHS compliant since date code: 0437B8  
Please see page 7 for more information



#### ■ ORDERING INFORMATION

[Example]       $\frac{NA}{(a)}$     $\frac{L}{(b)}$     $\frac{-}{(*)}$     $\frac{D}{(c)}$     $\frac{12}{(d)}$     $\frac{W}{(e)}$     $\frac{-}{(f)}$     $\frac{K}{(f)}$

(a)	Series Name	NA : NA Series
(b)	Operation Function	Nil : Standard type L : Latching type
(c)	Number of Coil	Nil : Single winding type D : Double winding type
(d)	Nominal Voltage	Refer to the COIL DATA CHART
(e)	Contact	W : Bifurcated type
(f)	Enclosure	K : Plastic sealed type

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

# NA SERIES

## COIL DATA CHART

	MODEL	Nominal voltage	Coil resistance (±10%)	Must operate voltage*1	Must release voltage*	Nominal power
Standard Type	NA-1.5 W-K	1.5 VDC	16.1 Ω	+1.13 VDC	+0.15 VDC	140 mW
	NA- 3 W-K	3 VDC	64.3 Ω	+2.25 VDC	+0.3 VDC	140 mW
	NA-4.5 W-K	4.5 VDC	145 Ω	+3.38 VDC	+0.45 VDC	140 mW
	NA- 5 W-K	5 VDC	178 Ω	+3.75 VDC	+0.5 VDC	140 mW
	NA- 6 W-K	6 VDC	257 Ω	+4.5 VDC	+0.6 VDC	140 mW
	NA- 9 W-K	9 VDC	579 Ω	+6.75 VDC	+0.9 VDC	140 mW
	NA-12 W-K	12 VDC	1,028 Ω	+9.0 VDC	+1.2 VDC	140 mW
	NA-18 W-K	18 VDC	1,620 Ω	+13.5 VDC	+1.8 VDC	200 mW
	NA-24 W-K	24 VDC	2,880 Ω	+18.0 VDC	+2.4 VDC	200 mW
	NA-48 W-K	48 VDC	7,680 Ω	+36.0 VDC	+4.8 VDC	300 mW

Note: \*1 Specified values are subject to pulse wave voltage.  
All values in the table are measured at 20°C.

	MODEL	Nominal voltage	Coil resistance (±10%)	Set voltage	Reset voltage	Nominal power
Single Winding Latching Type	NAL-1.5W-K	1.5 VDC	22.5 Ω	+1.13 VDC	-1.13 VDC	100 mW
	NAL- 3 W-K	3 VDC	90 Ω	+2.25 VDC	-2.25 VDC	100 mW
	NAL-4.5W-K	4.5 VDC	203 Ω	+3.38 VDC	-3.38 VDC	100 mW
	NAL- 5 W-K	5 VDC	250 Ω	+3.75 VDC	-3.75 VDC	100 mW
	NAL- 6 W-K	6 VDC	360 Ω	+4.5 VDC	-4.5 VDC	100 mW
	NAL- 9 W-K	9 VDC	810 Ω	+6.75 VDC	-6.75 VDC	100 mW
	NAL-12 W-K	12 VDC	1,440 Ω	+9.0 VDC	-9.0 VDC	100 mW
	NAL-18 W-K	18 VDC	2,160 Ω	+13.5 VDC	-13.5 VDC	150 mW
	NAL-24 W-K	24 VDC	3,840 Ω	+18.0 VDC	-18.0 VDC	150 mW
Double Winding Latching Type	NAL-D1.5W-K	1.5 VDC	P 11.25 Ω	+1.13 VDC		200 mW
			S 11.25 Ω		+1.13 VDC	
	NAL-D 3 W-K	3 VDC	P 45 Ω	+2.25 VDC		200 mW
			S 45 Ω		+2.25 VDC	
	NAL-D4.5W-K	4.5 VDC	P 101 Ω	+3.38 VDC		200 mW
			S 101 Ω		+3.38 VDC	
	NAL-D 5 W-K	5 VDC	P 125 Ω	+3.75 VDC		200 mW
			S 125 Ω		+3.75 VDC	
	NAL-D 6 W-K	6 VDC	P 180 Ω	+4.5 VDC		200 mW
			S 180 Ω		+4.5 VDC	
	NAL-D 9 W-K	9 VDC	P 405 Ω	+6.75 VDC		200 mW
			S 405 Ω		+6.75 VDC	
NAL-D12 W-K	12 VDC	P 720 Ω	+9.0 VDC		200 mW	
		S 720 Ω		+9.0 VDC		
NAL-D18 W-K	18 VDC	P 1,080 Ω	+13.5 VDC		300 mW	
		S 1,080 Ω		+13.5 VDC		
NAL-D24 W-K	24 VDC	P 1,920 Ω	+18.0 VDC		300 mW	
		S 1,920 Ω		+18.0 VDC		

Note: \*1 Specified values are subject to pulse wave voltage.  
All values in the table are measured at 20°C.

P: Primary coil S: Secondary coil

## ■ SPECIFICATIONS

Item		Standard Type	Single Winding Latching Type	Double Winding Latching Type
		NA-( ) W-K	NAL-( ) W-K	NAL-D ( ) W-K
Contact	Arrangement	2 form C (DPDT)		
	Material	Gold overlay silver alloy		
	Style	Bifurcated		
	Resistance (initial)	Maximum 50 mΩ (at 1 A 6 VDC)		
	Rating (resistive)	0.5 A 125 VAC or 1 A 30 VDC		
	Maximum Carrying Current	2 A		
	Maximum Switching Power	62.5 AV, 30 W		
	Maximum Switching Voltage	250 VAC, 220 VDC		
	Maximum Switching Current	2 A		
	Minimum Switching Load*1	0.01 mA 10 mVDC		
	Capacitance	Approximately 0.5 pF (between open contacts, adjacent contacts) Approximately 1.0 pF (between coil and contacts)		
Coil	Nominal Power (at 20°C)	140 to 300 mW	100 to 150 mW	200 to 300 mW
	Operate Power (at 20°C)	80 to 170 mW	60 to 85 mW	115 to 170 mW
	Operating Temperature	-40°C to +85°C (no frost)(refer to the CHARACTERISTIC DATA)		
Time Value	Operate (at nominal voltage)	Maximum 6 ms	Maximum 6 ms (set)	
	Release (at nominal voltage)	Maximum 4 ms	Maximum 6 ms (reset)	
Life	Mechanical	1 × 10 <sup>8</sup> operations minimum      1 × 10 <sup>7</sup> operations minimum		
	Electrical	2 × 10 <sup>5</sup> ops. min. (0.5 A 125 VAC), 5 × 10 <sup>5</sup> ops. min. (1 A 30 VDC)		
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 3.3 mm)	
		Endurance	10 to 55 Hz (double amplitude of 5.0 mm)	
	Shock Resistance	Misoperation	500 m/s <sup>2</sup> (11 ±1 ms)	
		Endurance	1,000 m/s <sup>2</sup> ( 6 ±1 ms)	
	Weight	Approximately 1.5 g		

\*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

# NA SERIES

## ■ INSULATION

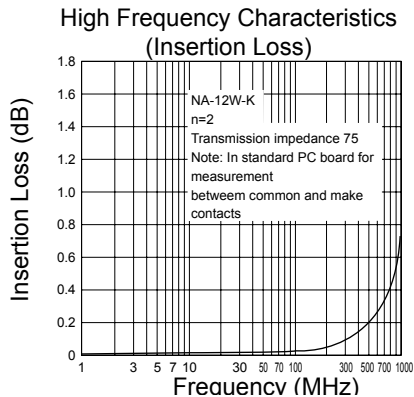
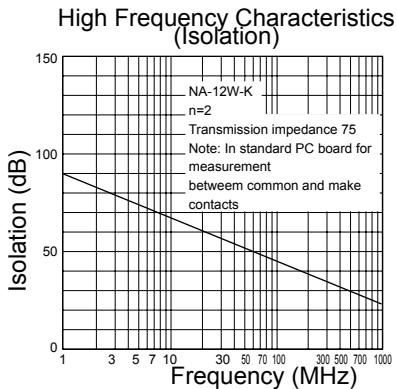
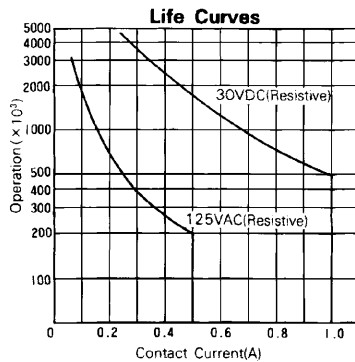
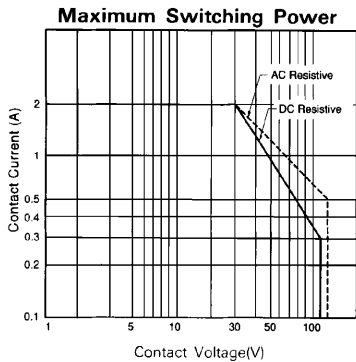
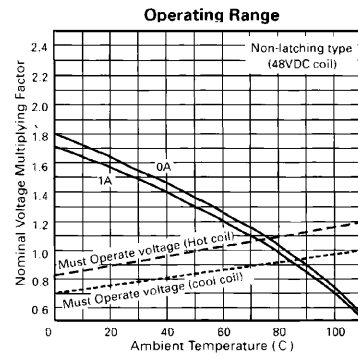
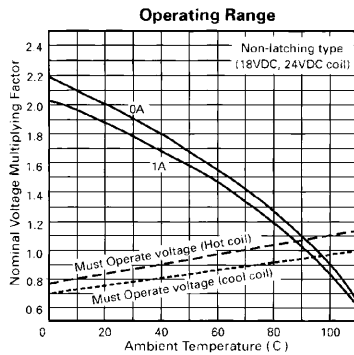
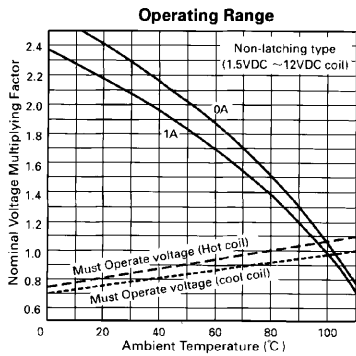
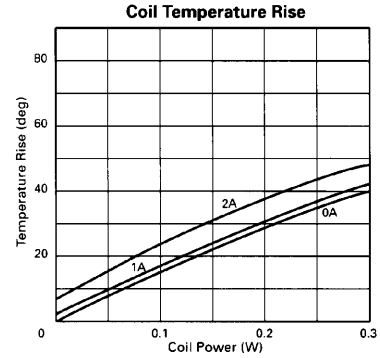
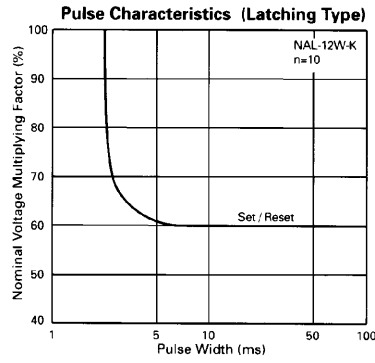
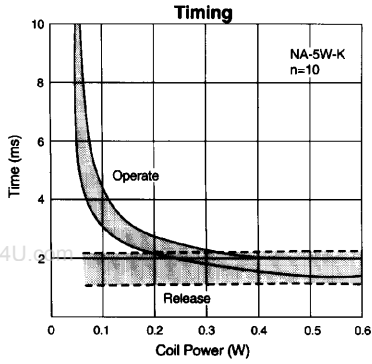
Item	Standard	Single latching	Double latching
Resistance (initial) (500 VDC)	Minimum 1,000 MΩ		
Dielectric Strength	1,000 VAC 1 min. (open contacts / adjacent contents)		
	1,500 VAC 1 min. (coil and contacts)		1,000 VAC 1 min. (coil and contacts)
Surge Voltage	1,500V (open contact and adjacent contact) 10 x 700μs standard wave		
	2,500V (coil and contact) 2 x 10μs standard wave		1,500V (coil and contact) 10 x 160μs standard wave

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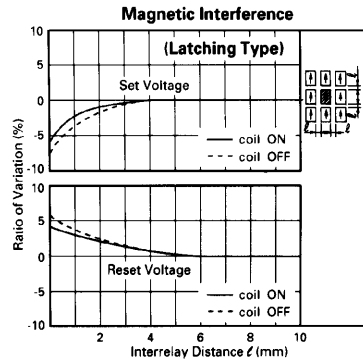
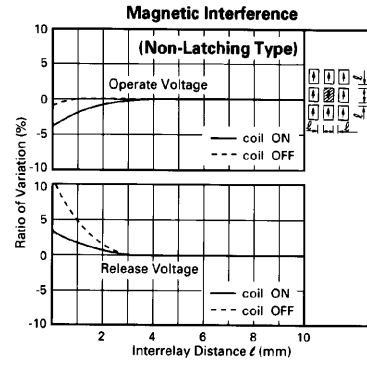
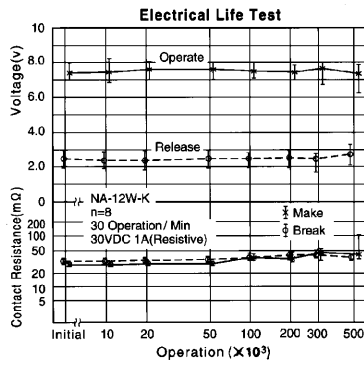
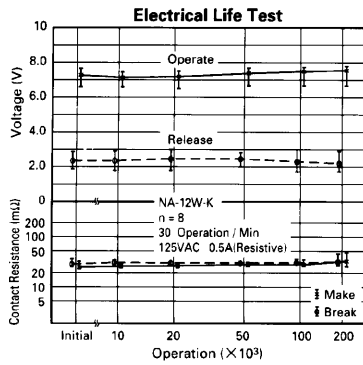
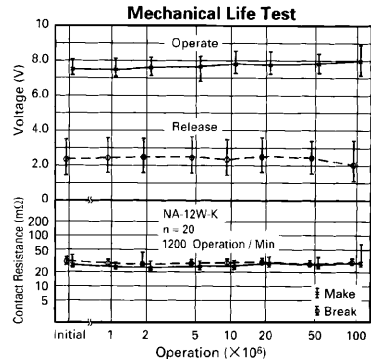
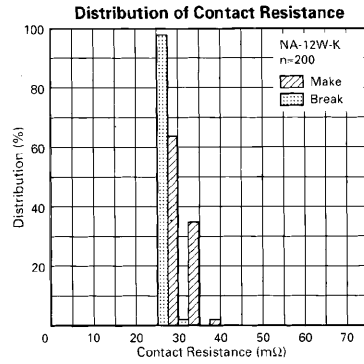
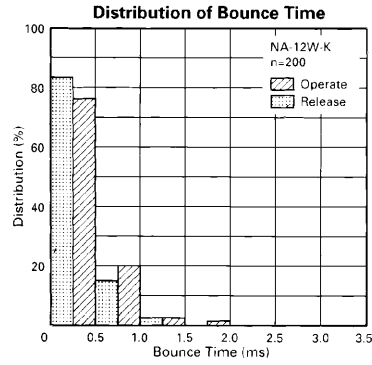
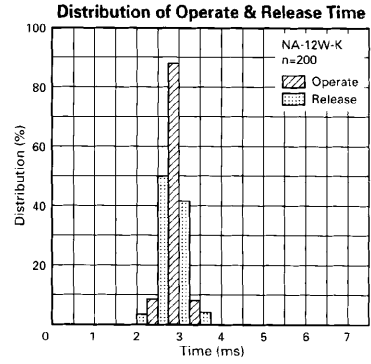
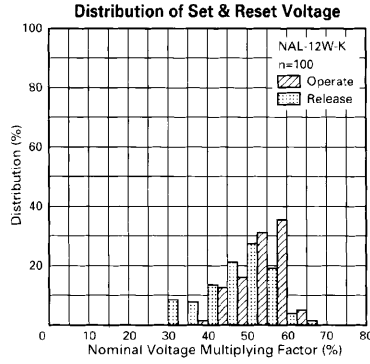
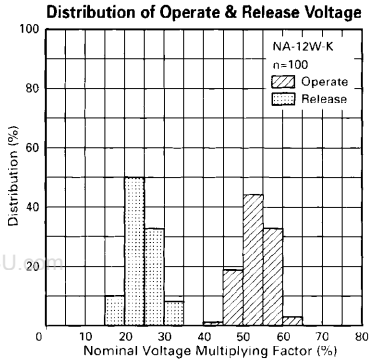
## ■ SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 508, UL 1950	Flammability: UL 94-V0 (plastics) 0.5A, 125VAC (general use) 2A, 30VDC (resistive) 0.3A, 110VDC (resistive)
	E45026	
CSA	C22.2 No. 14, No. 950 LR 35579	

## CHARACTERISTIC DATA



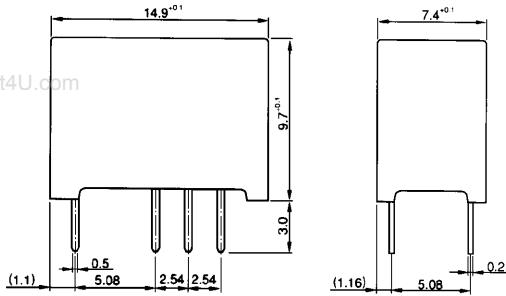
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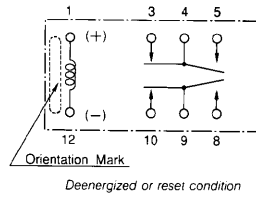
## ■ DIMENSIONS

- Dimensions

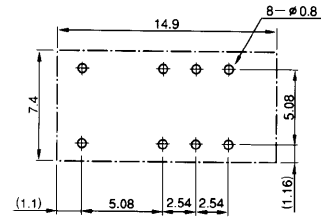
NA, NAL type (Non-latching type, single winding latching type)



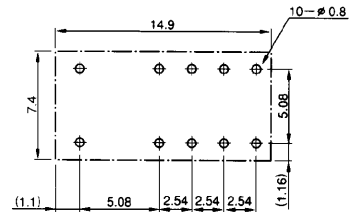
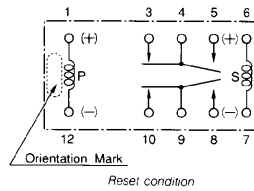
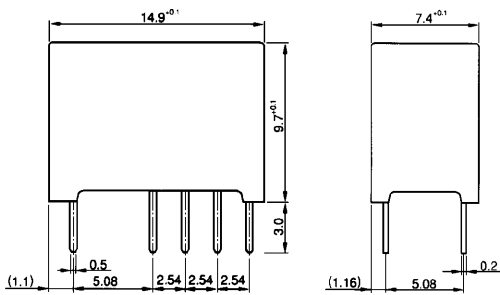
- Schematics (Bottom View)



- PC board mounting hole layout (Bottom View)



NAL-D type (double winding latching type)



Unit: mm

## RoHS Compliance and Lead Free Relay Information

### 1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. All of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

### 2. Recommended Lead Free Solder Profile

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

#### Reflow Solder condition

**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.

### 4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. No considerable length whisker was found by our in house test.



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