

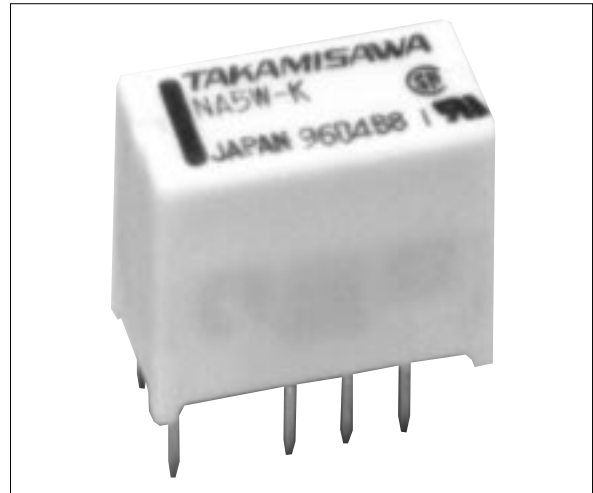
# MINIATURE RELAY

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

### NA SERIES

#### ■ 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)
- UL, CSA recognized
- High sensitivity and low consumption power
- Maximum switching capacity—4.2 A 700 VAC
- High reliability—bifurcated contacts
- DIL pitch terminals
- Plastic sealed type



#### ■ ORDERING INFORMATION

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

(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 (\*)

#### ■ SAFETY STANDARD AND FILE NUMBERS

UL508, 1950, 478 (File No. E45026)

C22.2 No. 0, No. 14, No. 950 (File No. LR35579)

Only UL/CSA approval markings are marked on the cover.

Nominal voltage	Contact rating
1.5 to 48 VDC	0.5 A 125 VAC
	2 A 30 VDC
	0.3 A 110 VDC
	— resistive

**■ 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)	0.14 to 0.3 W	0.1 to 0.15 W	0.20 to 0.3 W
	Operate Power (at 20°C)	0.08 to 0.17 W	0.06 to 0.085 W	0.115 to 0.17 W
	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)	
Insulation	Resistance (at 500 VDC)	Minimum 1,000 MΩ		
	Dielectric Strength	between open contacts	1,000 VAC 1 minute	
		between adjacent contacts	1,000 VAC 1 minute	
		between coil and contacts	1,500 VAC 1 minute	1,000 VAC 1 minute
	Surge Strength	between open contacts	1,500 V (at 10 × 700 μs)	
		between adjacent contacts	1,500 V (at 10 × 700 μs)	
between coil and contacts		2,500 V (at 2 × 10 μs)	1,500 V (at 10 × 160 μs)	
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.

**■ COIL DATA CHART**

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

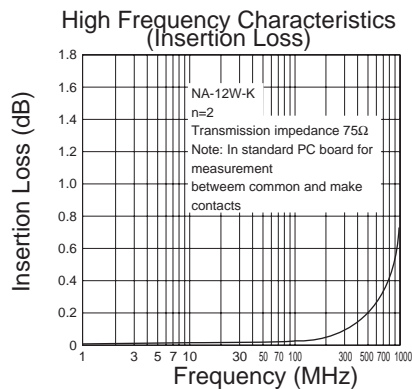
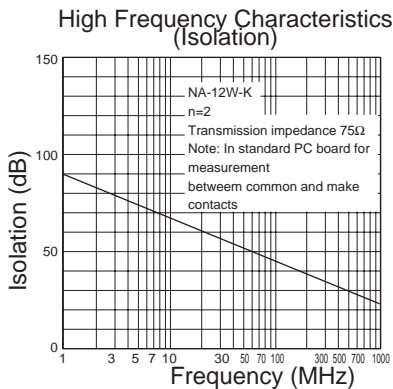
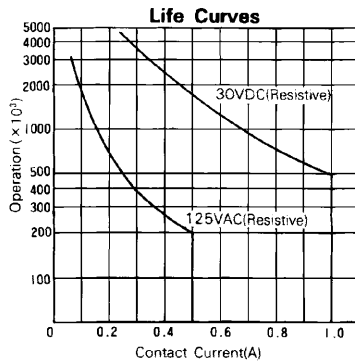
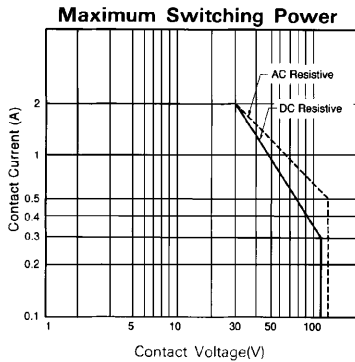
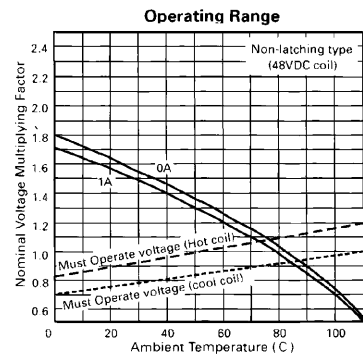
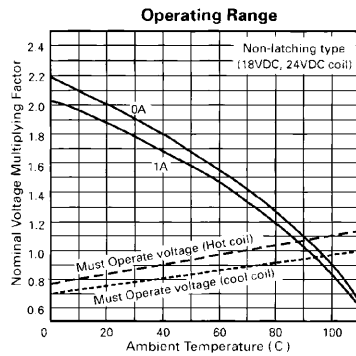
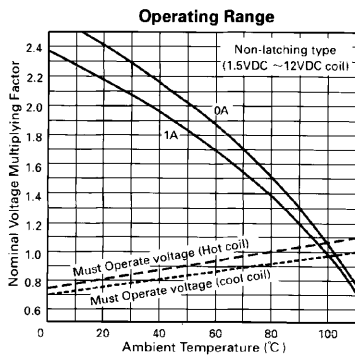
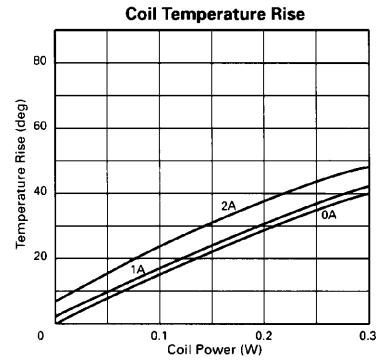
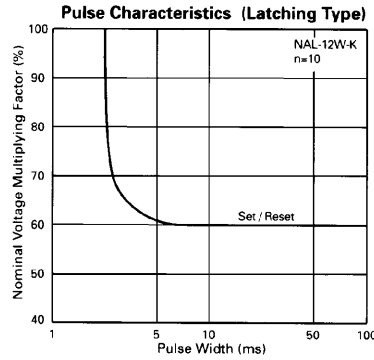
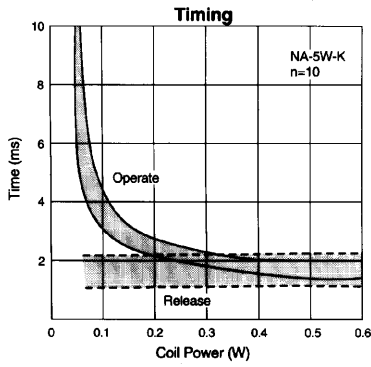
Note: \*<sup>1</sup> Specified values are subject to pulse wave voltage.  
All values in the table are measured at 20°C.

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

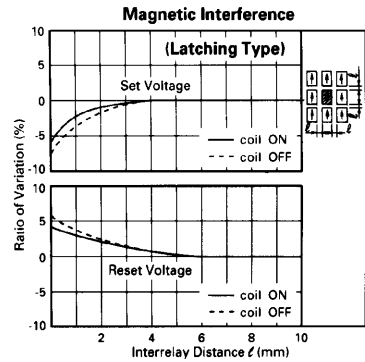
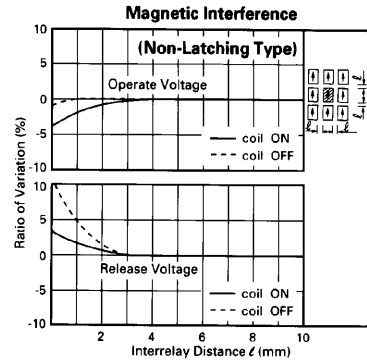
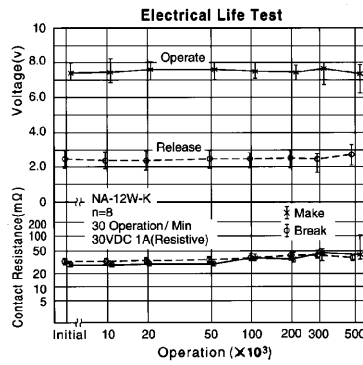
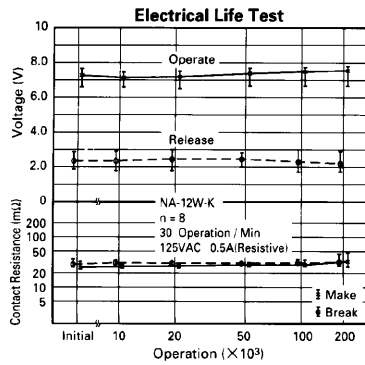
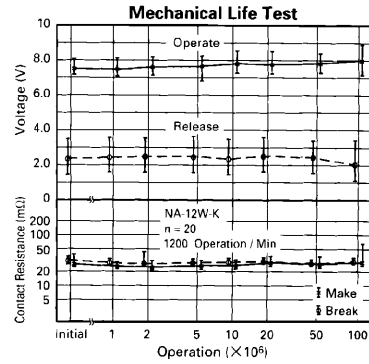
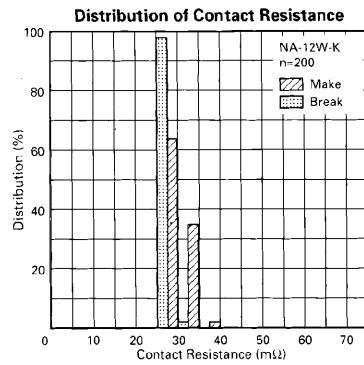
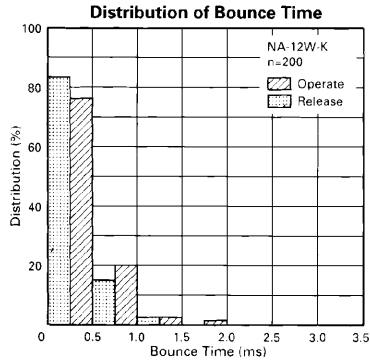
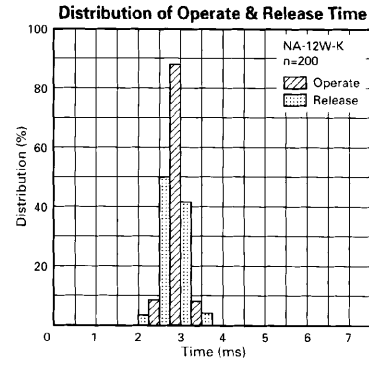
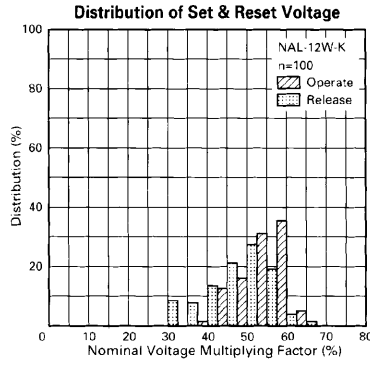
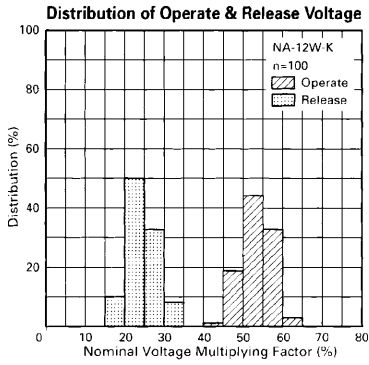
Note: \*<sup>1</sup> Specified values are subject to pulse wave voltage.  
All values in the table are measured at 20°C.

P: Primary coil S: Secondary coil

## CHARACTERISTIC DATA



## ■ REFERENCE DATA



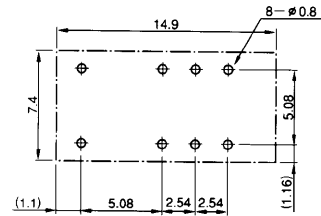
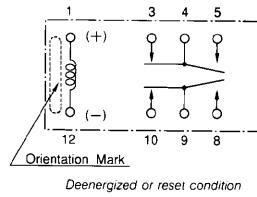
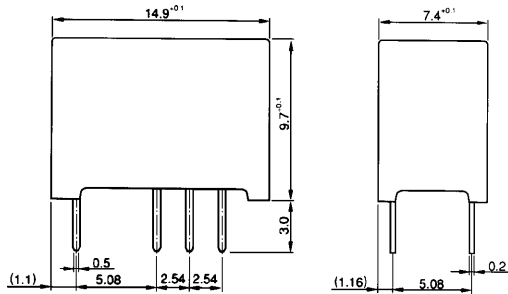
## ■ DIMENSIONS

### ● Dimensions

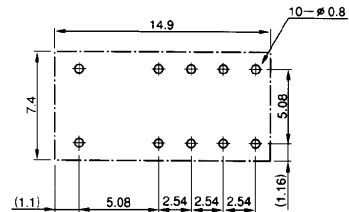
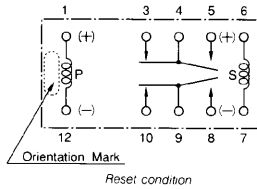
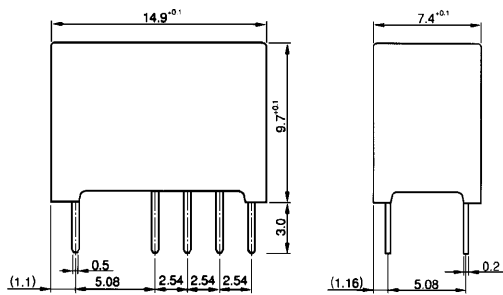
### ● Schematics (Bottom View)

### ● PC board mounting hole layout (Bottom View)

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



NAL-D type (double winding latching type)



Unit: mm

## Fujitsu Takamisawa International Headquarter Offices

[www.fujitsu.takamisawa.com](http://www.fujitsu.takamisawa.com)

### Japan

Fujitsu Takamisawa Component Limited  
Global Marketing and Sales  
Gotanda-Chuo Building  
3-5, Higashigotanda 2-chome, Shinagawa-ku  
Tokyo 141, Japan  
Tel: (81-3) 5449-7010  
Fax: (81-3) 5449-2626

### North and South America

Fujitsu Takamisawa America, Inc.  
250 E. Caribbean Drive  
Sunnyvale, CA 94089 U.S.A.  
Tel: (1-408) 745-4900  
Fax: (1-408) 745-4970

### Europe

Fujitsu Takamisawa Europe B.V.  
Diamantlaan 25  
2132 WV Hoofddorp  
Netherlands  
Tel: (31-23) 5560910  
Fax: (31-23) 5560950

### Asia Pacific

Fujitsu Takamisawa Asia Pacific Pte. Ltd.  
102E Pasir Panjang Road  
#04-01 Citilink Warehouse Complex  
Singapore 118529  
Tel: (65) 375-8560  
Fax: (65) 273-3021