■ 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		62.5VA / 30W		
	Max. switching current		2A		
	Min. switching load *		0.01 mA, 10 mVDC		
	Capacitance (at 1kHz, reference)		Approx. 0.5 pF (open contacts, adjacent contacts) 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), Min. 500 x 10^3 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 range		-40 °C to +85 °C (no frost)		
Timing Data	Operate (at nominal voltage, without bounce)		Max. 6 ms	Max. 6 ms (set)	
	Release (at nominal voltage, without bounce)		Max. 4 ms	Max. 6 ms (reset)	
Insulation	Resistance (Initial)		Min. 1,000MΩ 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 55 to 10Hz single amplitude 1.65mm		
		Endurance	10 to 55 to 10Hz single amplitude 2.5mm		
	Shock	Misoperation	500m/s² (11 ± 1ms)		
		Endurance	1,000m/s² (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	140
3	3	64.3	+2.25	+0.3	
4.5	4.5	145	+3.38	+0.45	
5	5	178	+3.75	+0.5	
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	
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	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 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		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
Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

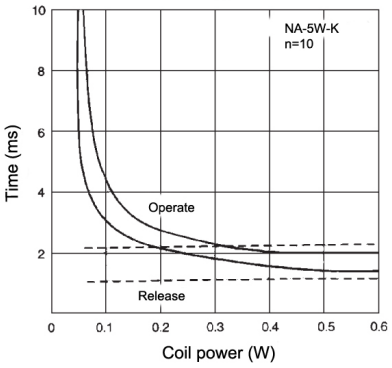
■ SAFETY STANDARDS

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

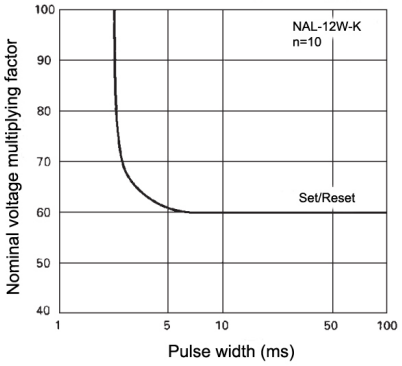
Complies to IEC60950-1; FCC part 68: Telcordia
(Relay is only marked with UL and CSA logo)

■ CHARACTERISTIC DATA

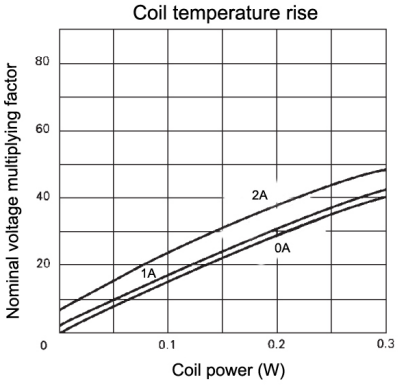
Timing



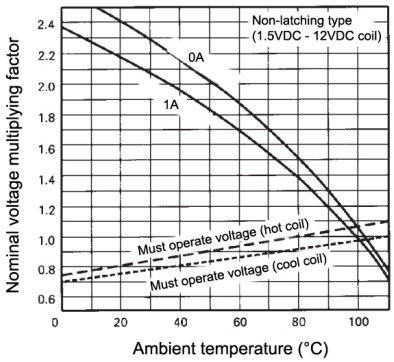
Pulse Characteristics (Latching type)



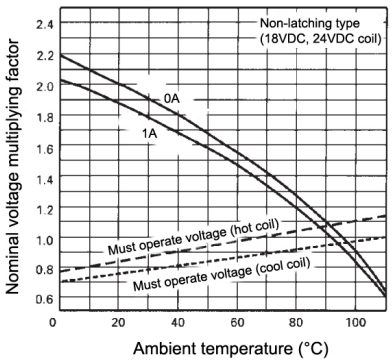
Coil temperature rise



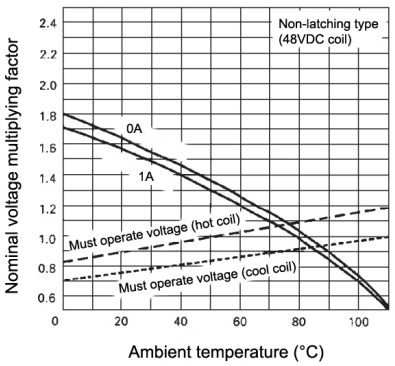
Operating range



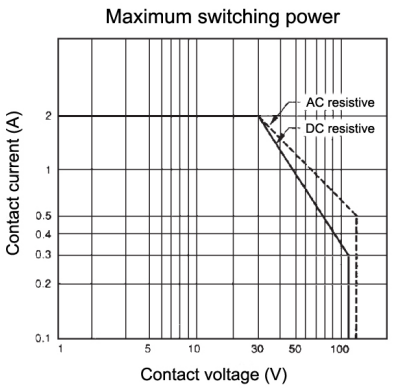
Operating range



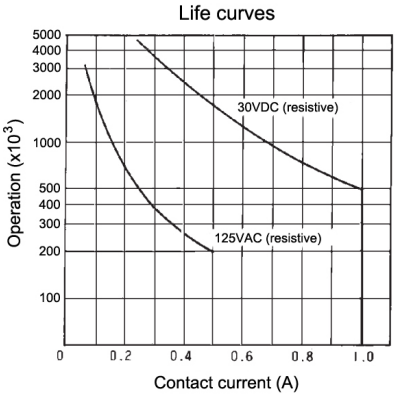
Operating range



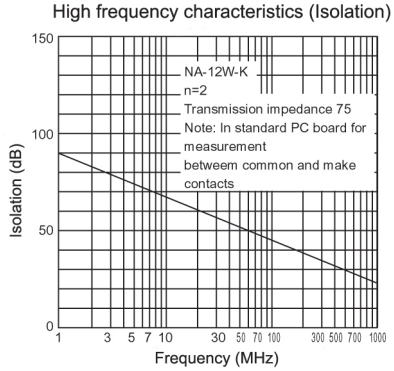
Maximum switching power



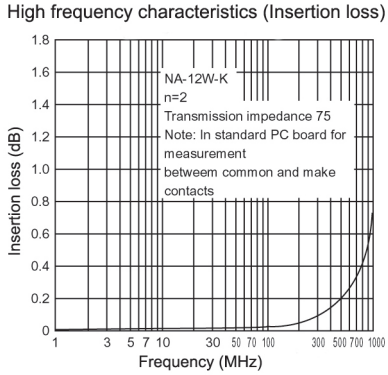
Life curves



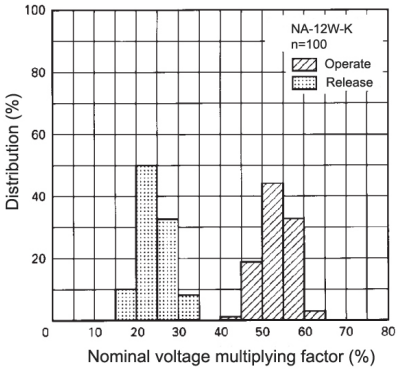
High frequency characteristics (Isolation)



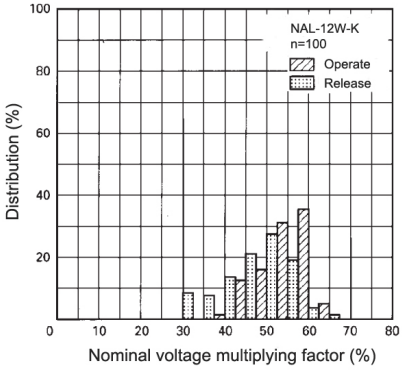
High frequency characteristics (Insertion loss)



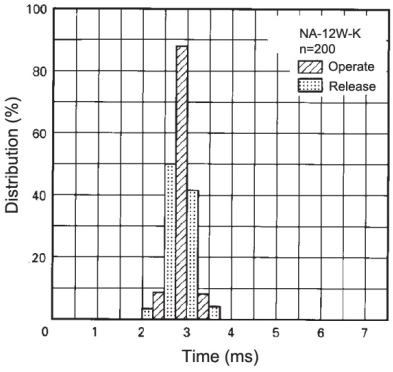
Distribution of operate & release voltage



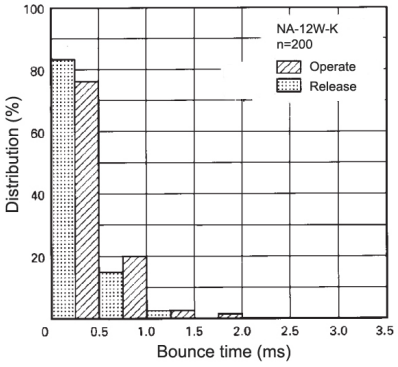
Distribution of set & reset voltage



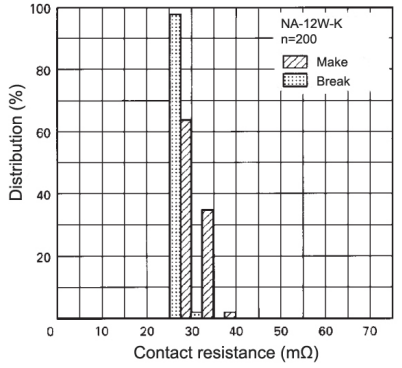
Distribution of operate & release time



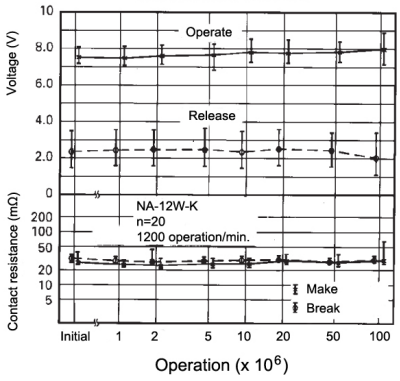
Distribution of bounce time



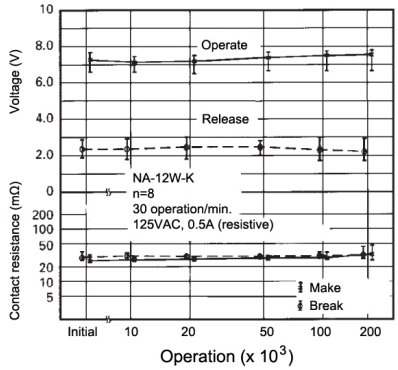
Distribution of contact resistance



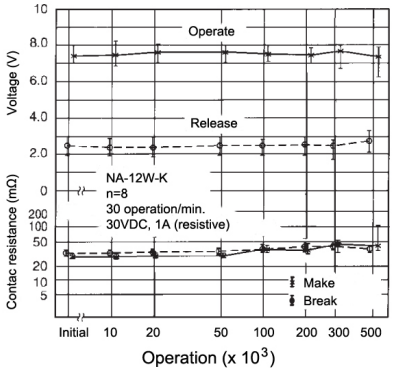
Mechanical life test



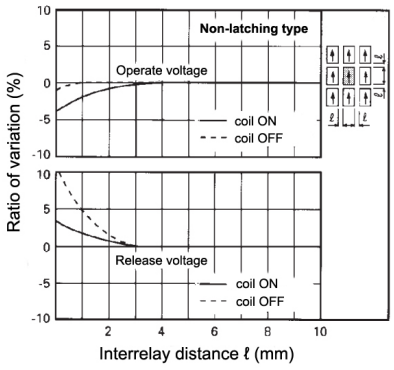
Electrical life test



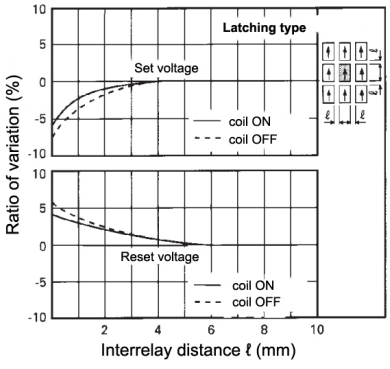
Electrical life test



Magnetic interference



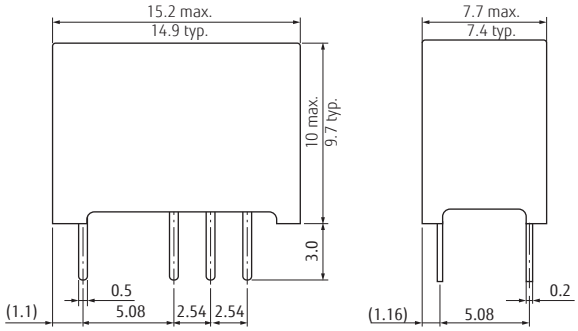
Magnetic interference



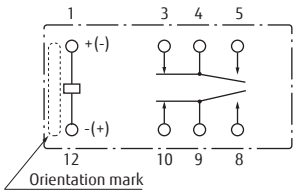
■ DIMENSIONS

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

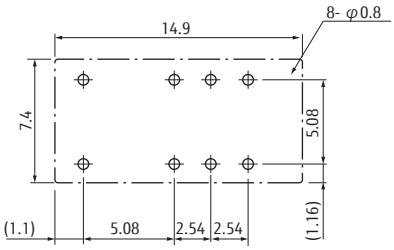
- **Dimensions**



- **Schematics** (BOTTOM VIEW)

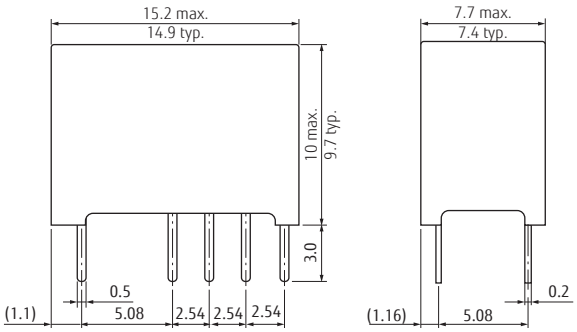


- **PC board mounting hole layout** (BOTTOM VIEW)

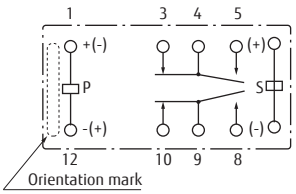


NAL-D (double winding latching type)

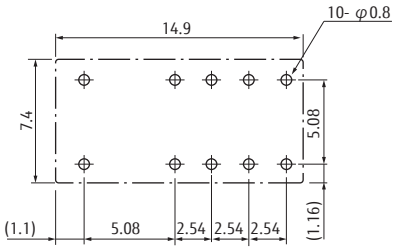
- **Dimensions**



- **Schematics** (BOTTOM VIEW)



- **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 Temperature:	30-60W 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.

Fujitsu Components International Headquarter Offices

Japan
FUJITSU COMPONENT LIMITED
Shinagawa Seaside Park Tower 19F,
12-4, Higashi-shinagawa 4-chome, Shinagawa-ku,
Tokyo,140-0002, Japan
Tel: (81-3) 3450-1682
Fax: (81-3) 3474-2385
Email: fcl-contact@cs.jp.fujitsu.com
Web: www.fujitsu.com/jp/fcl/

North and South America
FUJITSU COMPONENTS AMERICA, INC
2290 North First Street, Suite 212
San Jose, CA 95131, USA
Tel: (1-408) 745-4900
Fax: (1-408) 745-4970
Email: components@us.fujitsu.com
Web: us.fujitsu.com/components

Europe
FUJITSU COMPONENTS EUROPE B.V.
Diamantlaan 25
2132 WV Hoofddorp
Netherlands
Tel: (31-23) 5560910
Fax: (31-23) 5560950
Email: info@fceu.fujitsu.com
Web: www.fujitsu.com/uk/components

Asia Pacific
FUJITSU COMPONENTS ASIA, LTD.
102E Pasir Panjang Road
#01-01 Citilink Warehouse Complex
Singapore 118529
Tel: (65) 6375-8560
Fax: (65) 6273-3021
Email: fcal@sg.fujitsu.com
Web: www.fujitsu.com/sg/products/devices/components

China
FUJITSU ELECTRONIC COMPONENTS (SHANGHAI) CO., LTD.
Unit 4306, InterContinental Center
100 Yu Tong Road, Shanghai 200070,
China
Tel: (86-21) 3253 0998
Fax: (86-21) 3253 0997
Email: fcsh@cn.fujitsu.com
Web: www.fujitsu.com/cn/products/devices/components/

Hong Kong
FUJITSU COMPONENTS HONG KONG CO., LTD
Unit 506, Inter-Continental Plaza
No.94 Granville Road, Tsim Sha Tsui, Kowloon,
Hong Kong
Tel: (852) 2881-8495
Tex: (852) 2894-9512
Email: fcal@sg.fujitsu.com
Web: www.fujitsu.com/sg/products/devices/components/

Korea
FUJITSU COMPONENTS KOREA LIMITED
Alpha Tower #403, 645 Sampyeong-dong,
Bundang-gu, Seongnam-si, Gyeonggi-do,
13524 Korea
Tel: (82) 31-708-7108
Fax: (82) 31-709-7108
Email: fcal@sg.fujitsu.com
www.fujitsu.com/sg/products/devices/components/