

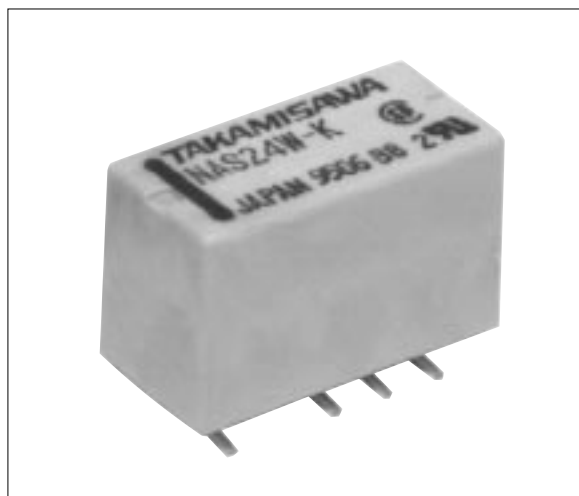
# MINIATURE RELAY (SURFACE MOUNT TYPE)

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

### NAS SERIES

#### ■ FEATURES

- 2 form C small size, surface mounting relay
- 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 μs surge wave)
- UL, CSA recognized
- High sensitivity and low consumption power
  - Operating power: 60 to 70 mW
  - Nominal power: 100 to 300 mW
- High reliability—bifurcated contacts
- DIL pitch terminals
- Plastic sealed type



#### ■ ORDERING INFORMATION

[Example]  $\frac{\text{NAS}}{\text{(a)}} \frac{\text{L}}{\text{(b)}} - \frac{\text{D}}{\text{(c)}} \frac{12}{\text{(d)}} \frac{\text{W}}{\text{(e)}} - \frac{\text{K}}{\text{(f)}} \frac{\text{B}}{\text{(g)}} \frac{05}{\text{(h)}}$

(a)	Series Name	NAS: NAS 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
(g)	Packaging Orientation	B : Standard type
(h)	Packaging Quantity	05 : 500 pieces

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

#### ■ SAFETY STANDARD AND FILE NUMBERS

UL478, 508, 1950 (File No. E45026)

C22.2 No. 14 (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

# NAS SERIES

## ■ SPECIFICATIONS

Item		Standard Type	Single Winding Latching Type	Double Winding Latching Type
		NAS-( ) W-K	NASL-( ) W-K	NASL-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 (at 1 kHz)	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 CHARACTERISING 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 1.8 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.

# NAS SERIES

## ■ 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	NAS-1.5 W-K	1.5 VDC	16.1 $\Omega$	+1.13 VDC	+0.15 VDC	140 mW
	NAS- 3 W-K	3 VDC	64.3 $\Omega$	+2.25 VDC	+0.3 VDC	140 mW
	NAS-4.5 W-K	4.5 VDC	145 $\Omega$	+3.38 VDC	+0.45 VDC	140 mW
	NAS- 5 W-K	5 VDC	178 $\Omega$	+3.75 VDC	+0.5 VDC	140 mW
	NAS- 6 W-K	6 VDC	257 $\Omega$	+4.5 VDC	+0.6 VDC	140 mW
	NAS- 9 W-K	9 VDC	579 $\Omega$	+6.75 VDC	+0.9 VDC	140 mW
	NAS- 12 W-K	12 VDC	1,028 $\Omega$	+9.0 VDC	+1.2 VDC	140 mW
	NAS- 18 W-K	18 VDC	1,620 $\Omega$	+13.5 VDC	+1.8 VDC	200 mW
	NAS- 24 W-K	24 VDC	2,880 $\Omega$	+18.0 VDC	+2.4 VDC	200 mW
	NAS- 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* <sup>1</sup>	Reset voltage* <sup>1</sup>	Nominal power
Single Winding Latching Type	NASL-1.5 W-K	1.5 VDC	22.5 $\Omega$	+1.13 VDC	-1.13 VDC	100 mW
	NASL- 3 W-K	3 VDC	90 $\Omega$	+2.25 VDC	-2.25 VDC	100 mW
	NASL-4.5 W-K	4.5 VDC	203 $\Omega$	+3.38 VDC	-3.38 VDC	100 mW
	NASL- 5 W-K	5 VDC	250 $\Omega$	+3.75 VDC	-3.75 VDC	100 mW
	NASL- 6 W-K	6 VDC	360 $\Omega$	+4.5 VDC	-4.5 VDC	100 mW
	NASL- 9 W-K	9 VDC	810 $\Omega$	+6.75 VDC	-6.75 VDC	100 mW
	NASL- 12 W-K	12 VDC	1,440 $\Omega$	+9.0 VDC	-9.0 VDC	100 mW
	NASL- 18 W-K	18 VDC	2,160 $\Omega$	+13.5 VDC	-13.5 VDC	150 mW
	NASL- 24 W-K	24 VDC	3,840 $\Omega$	+18.0 VDC	-18.0 VDC	150 mW
Double Winding Latching Type	NASL-D1.5 W-K	1.5 VDC	P 11.25 $\Omega$	+1.13 VDC		200 mW
			S 11.25 $\Omega$		+1.13 VDC	
	NASL-D 3 W-K	3 VDC	P 45 $\Omega$	+2.25 VDC		200 mW
			S 45 $\Omega$		+2.25 VDC	
	NASL-D4.5 W-K	4.5 VDC	P 101 $\Omega$	+3.38 VDC		200 mW
			S 101 $\Omega$		+3.38 VDC	
	NASL-D 5 W-K	5 VDC	P 125 $\Omega$	+3.75 VDC		200 mW
			S 125 $\Omega$		+3.75 VDC	
	NASL-D 6 W-K	6 VDC	P 180 $\Omega$	+4.5 VDC		200 mW
			S 180 $\Omega$		+4.5 VDC	
	NASL-D 9 W-K	9 VDC	P 405 $\Omega$	+6.75 VDC		200 mW
			S 405 $\Omega$		+6.75 VDC	
NASL-D 12 W-K	12 VDC	P 720 $\Omega$	+9.0 VDC		200 mW	
		S 720 $\Omega$		+9.0 VDC		
NASL-D 18 W-K	18 VDC	P 1,080 $\Omega$	+13.5 VDC		300 mW	
		S 1,080 $\Omega$		+13.5 VDC		
NASL-D 24 W-K	24 VDC	P 1,920 $\Omega$	+18.0 VDC		300 mW	
		S 1,920 $\Omega$		+18.0 VDC		

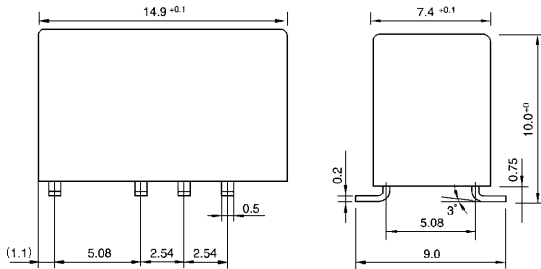
Note: \*<sup>1</sup> Specified values are subject to pulse wave voltage.  
All values in the table are measured at 20°C.

P: Primary coil S: Secondary coil

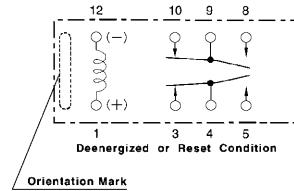
## ■ DIMENSIONS

### ● Dimensions

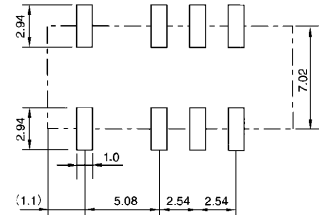
NAS, NASL type (Non-latching type, single winding latching type)



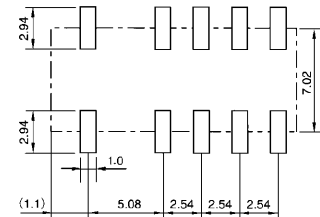
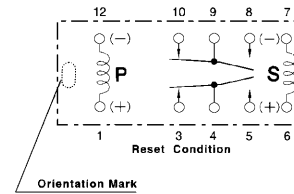
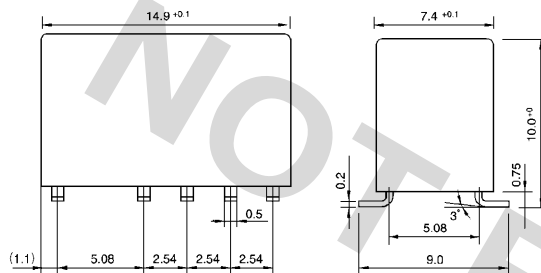
### ● Schematics (top view)



### ● PC board mounting pad layout (top view)



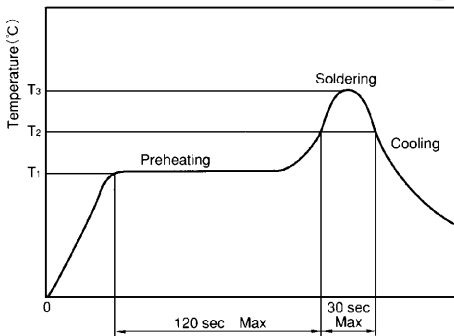
NASL-D type (Double winding latching type)



Unit: mm

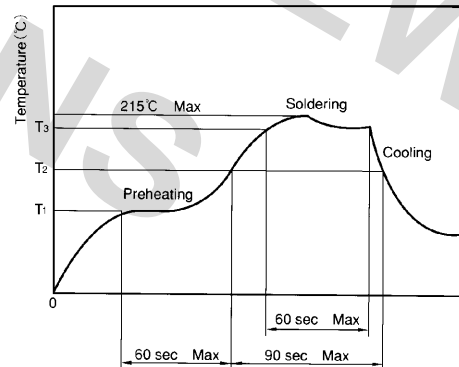
## ■ RECOMMENDED SOLDERING CONDITIONS (TEMPERATURE PROFILE)

### IRS (Infrared Reflow Soldering)



T<sub>3</sub> = 245°C Max  
T<sub>2</sub> = 200°C Max  
T<sub>1</sub> = 165°C Max

### VPS (Vapor Phase Soldering)



T<sub>3</sub> = 200°C Max  
T<sub>2</sub> = 165°C Max  
T<sub>1</sub> = 100°C Max

- Note:
1. Temperature profiles show the temperature of PC board surface.
  2. Please perform soldering test with your actual PC board before mass production, since the temperatures of PC board surfaces vary according to the size of PC board, status of parts mounting and heating method.

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