## 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 $2,500 \mathrm{~V}$ between coil and contacts (at $2 \times$
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]

$$
\frac{N A}{(\mathrm{a})} \frac{\mathrm{L}}{(\mathrm{~b})}-\frac{\mathrm{D}}{(*)} \frac{12}{(\mathrm{c})} \frac{\mathrm{W}}{(\mathrm{~d})}-\frac{\mathrm{K}}{(\mathrm{e})}-\frac{\mathrm{f})}{(\mathrm{f})}
$$

| (a) | Series Name | NA : NA Series |
| :--- | :--- | :--- |
| (b) | Operation Function | Nil : Standard type <br> $\mathrm{L}:$ Latching type |
| (c) | Number of Coil | Nil : Single winding type <br> $\mathrm{D}:$ 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 | $\begin{array}{lr} \hline 0.5 \mathrm{~A} & 125 \text { VAC } \\ 2 \mathrm{~A} & 30 \text { VDC } \\ 0.3 \mathrm{~A} & 110 \text { VDC } \end{array}$ |

## SPECIFICATIONS

| Item |  |  | Standard Type | Single | ng Latching Type | Double Winding Latching Type |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | NA-( ) W-K |  | ) W-K | NAL-D ( ) W-K |
| Contact | Arrangement |  | 2 form C (DPDT) |  |  |  |
|  | Material |  | Gold overlay silver alloy |  |  |  |
|  | Style |  | Bifurcated |  |  |  |
|  | Resistance (initial) |  | Maximum $50 \mathrm{~m} \Omega$ (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 $20^{\circ} \mathrm{C}$ ) |  | 0.14 to 0.3 W | 0.1 to | 15 W | 0.20 to 0.3 W |
|  | Operate Power (at $20^{\circ} \mathrm{C}$ ) |  | 0.08 to 0.17 W | 0.06 | 0.085 W | 0.115 to 0.17 W |
|  | Operating Temperature |  | $-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ (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 M $\Omega$ |  |  |  |
|  | 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 | $1,500 \mathrm{~V}$ (at $10 \times 700 \mu \mathrm{~s}$ ) |  |  |  |
|  |  | between adjacent contacts | $1,500 \mathrm{~V}$ (at $10 \times 700 \mu \mathrm{~s})$ |  |  |  |
|  |  | between coil and contacts | $2,500 \mathrm{~V}$ (at $2 \times 10 \mu \mathrm{~s}$ ) |  |  | $1,500 \mathrm{~V}$ (at $10 \times 160 \mu \mathrm{~s}$ ) |
| Life | Mechanical |  | $1 \times 10^{8}$ operations minimum $1 \times 10^{7}$ operations minimum |  |  |  |
|  | Electrical |  | $2 \times 10^{5} \mathrm{ops}$. min. (0.5 A 125 VAC ), $5 \times 10^{5} \mathrm{ops}$. 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 <br> Resistance | Misoperation | $500 \mathrm{~m} / \mathrm{s}^{2}(11 \pm 1 \mathrm{~ms})$ |  |  |  |
|  |  | Endurance | $1,000 \mathrm{~m} / \mathrm{s}^{2}(6 \pm 1 \mathrm{~ms})$ |  |  |  |
|  | 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 | $\begin{aligned} & \text { Coil resistance } \\ & \quad( \pm 10 \%) \end{aligned}$ | Must operate voltage*1 | Must release voltage*1 | Nominal power |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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: *1 Specified values are subject to pulse wave voltage. All values in the table are measured at $20^{\circ} \mathrm{C}$.

|  | MODEL | Nominal voltage | Coil resistance ( $\pm 10 \%$ ) | Set voltage | Reset voltage | Nominal power |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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- $5 \mathrm{~W}-\mathrm{K}$ | 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 |
|  | 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: *1 Specified values are subject to pulse wave voltage.
P: Primary coil S: Secondary coil All values in the table are measured at $20^{\circ} \mathrm{C}$.

## CHARACTERISTIC DATA









High Frequency Characteristics



High Frequency Characteristics
(Insertion Loss)


## ■ 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

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