

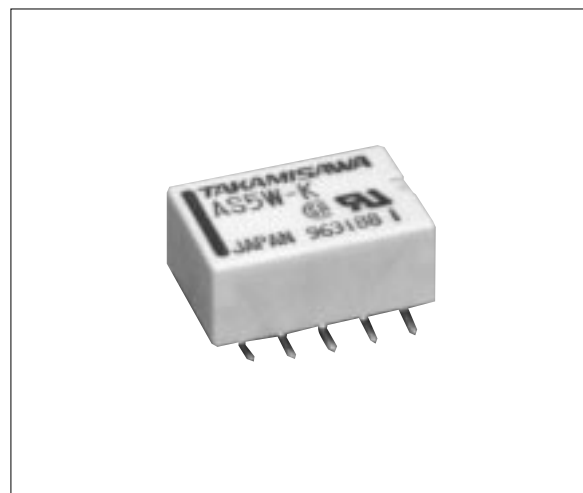
# MINIATURE RELAY

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

### AS SERIES

#### ■ FEATURES

- Flat type relay for surface mounting
- Super small and light weight
  - Height: 6.5 mm
  - Weight: approximately 1.5 g
- UL, CSA recognized
- Conforms to FCC Part 68
  - Surge strength: 500 V
- High sensitivity and low power consumption
- High reliability—bifurcated contacts
- DIL pitch terminals
- Plastic sealed type



#### ■ ORDERING INFORMATION

[Example]      AS   L   -   D   12   W   -   K   -   B   05  
                   (a)   (b)   (c)   (d)   (e)   (\*)   (f)   (g)   (h)

|     |                     |                                                    |
|-----|---------------------|----------------------------------------------------|
| (a) | Series Name         | AS : AS Series                                     |
| (b) | Operation Function  | Nil : Standard type<br>L : Latching type           |
| (c) | Number of Coil      | N : Single winding type<br>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) | Packing Orientation | B : Standard type                                  |
| (h) | Packing Quantity    | 05 : 500 pieces                                    |

Note: Actual marking omits the hyphen (-) of (\*) and "-B05"

## ■ SAFETY STANDARD AND FILE NUMBERS

UL478, 508 (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   | <div> <div>0.5 A 125 VAC</div> <div>2 A 30 VDC</div> <div>0.3 A 110 VDC</div> </div> <div>resistive</div> |

## ■ SPECIFICATIONS

| Item       |                              | Standard Type                                                                                                       | Single Winding Latching Type                                                              | Double Winding Latching Type |
|------------|------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------|
|            |                              | AS-( ) W-K                                                                                                          | ASL-( ) W-K                                                                               | ASL-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)<br>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                                                                           | 0.11 5 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                                                                                               | 750 VAC 1 minute                                                                          |                              |
|            |                              | between adjacent contacts                                                                                           | 1,000 VAC 1 minute                                                                        |                              |
|            |                              | between coil and contacts                                                                                           | 1,000 VAC 1 minute                                                                        |                              |
|            | Surge Strength               |                                                                                                                     | 1,500 V (at 10 × 160 μs) (between coil and contacts)                                      |                              |
| Life       | Mechanical                   |                                                                                                                     | 1 × 10 <sup>8</sup> operations minimum                                                    |                              |
|            | Electrical                   |                                                                                                                     | 1 × 10 <sup>7</sup> operations minimum                                                    |                              |
| Other      | Vibration Resistance         | Misoperation                                                                                                        | 2 × 10 <sup>5</sup> ops. min. (0.5 A 125 VAC), 5 × 10 <sup>5</sup> ops. min. (1 A 30 VDC) |                              |
|            |                              | Endurance                                                                                                           | 10 to 55 Hz (double amplitude of 3.3 mm)                                                  |                              |
|            | Shock Resistance             | Misoperation                                                                                                        | 10 to 55 Hz (double amplitude of 5.0 mm)                                                  |                              |
|            |                              | Endurance                                                                                                           | 500 m/s <sup>2</sup> (11 ±1 ms)                                                           |                              |
|            | Weight                       |                                                                                                                     | 1,000 m/s <sup>2</sup> ( 6 ±1 ms)                                                         |                              |

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

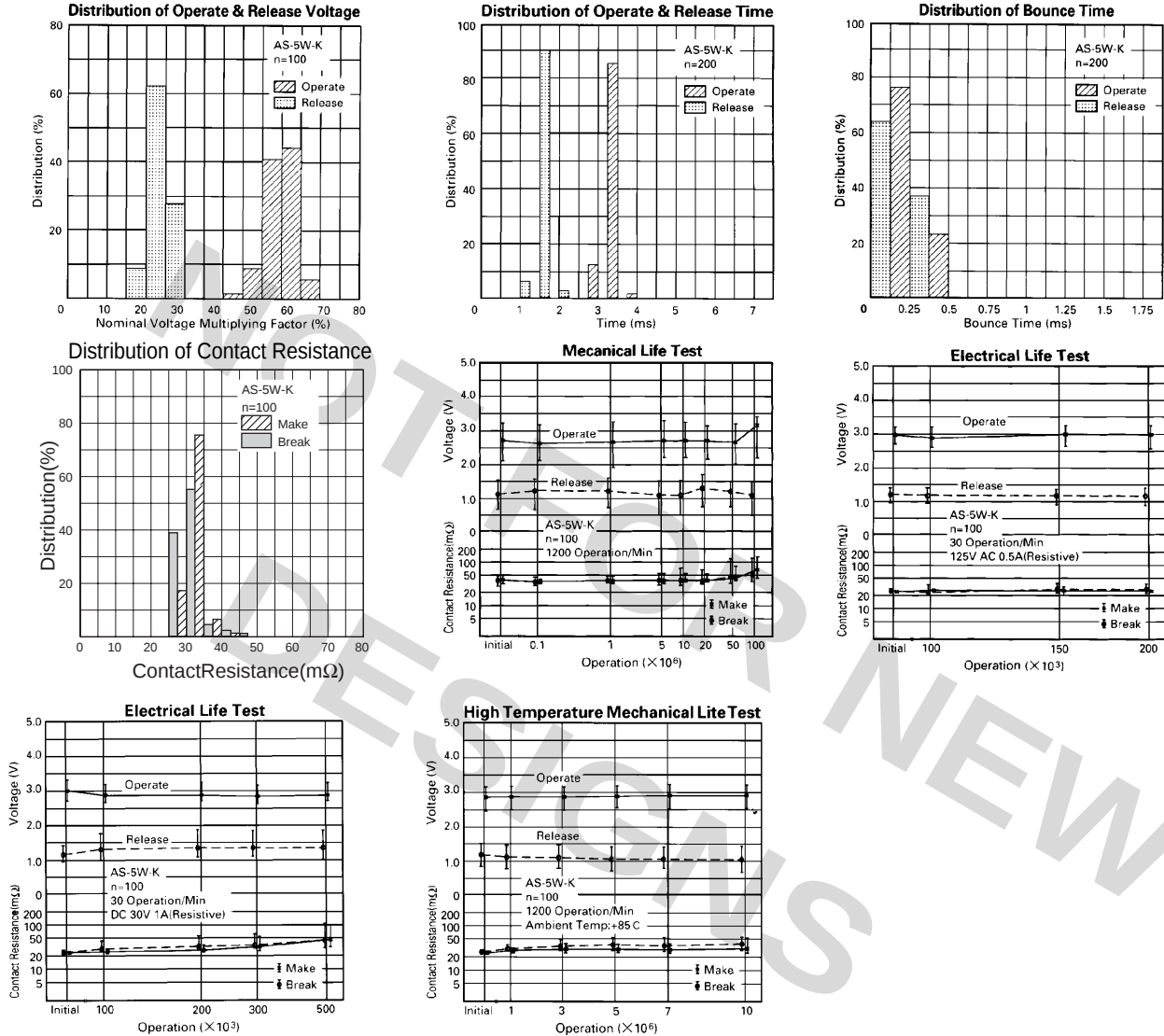
Note: \*<sup>1</sup> Specified values are subject to pulse wave voltage.  
All values in the table are measured at 20°C.

P: Primary coil S: Secondary coil

## ■ CHARACTERISTIC DATA

Please see A relays.

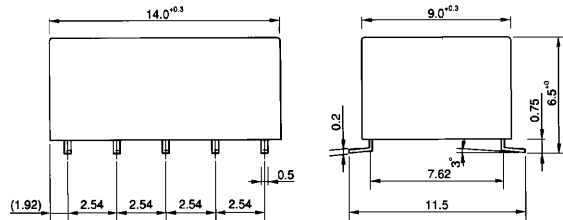
## ■ REFERENCE DATA



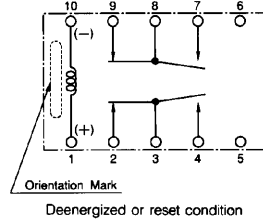
## ■ DIMENSIONS

### ● Dimensions

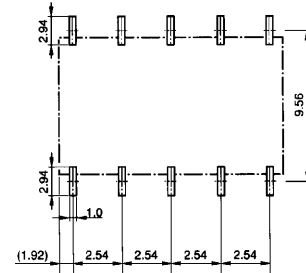
AS, ASL type (Non-latching type, single winding latching type)



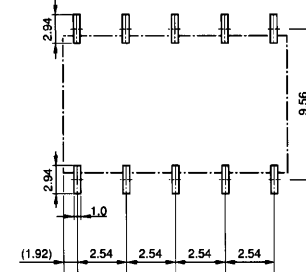
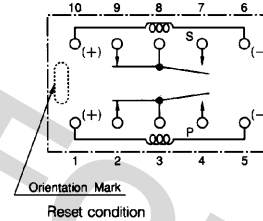
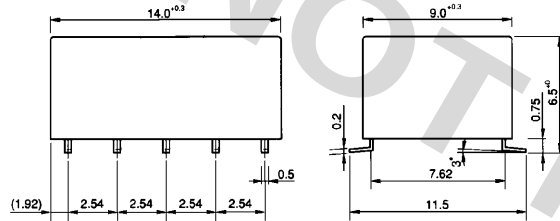
### ● Schematics (TOP VIEW)



### ● PC board mounting pad layout (TOP VIEW)



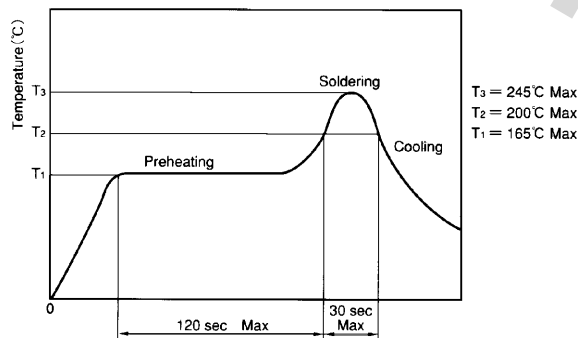
ASL-D type (Double winding latching type)



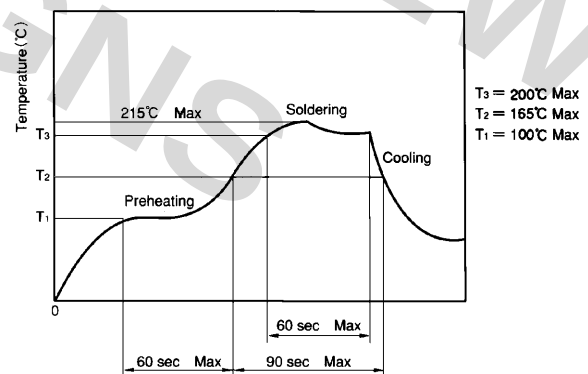
Unit: mm

## ■ RECOMMENDED SOLDERING CONDITIONS (TEMPERATURE PROFILE)

### IRS (Infrared Reflow Soldering)



### VPS (Vapor Phase Soldering)



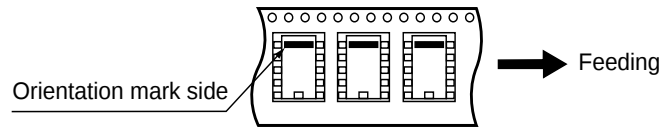
- Note:
1. Temperature profiles show the temperature of the PC board surface.
  2. Please perform soldering test with your actual PC board before mass production, since the temperatures of PC board surfaces vary according to the size of PC board, status of parts mounting and heating method.

## ■ PACKING

### (1) PACKING METHOD (ONLY TAPE PACKING IS AVAILABLE)

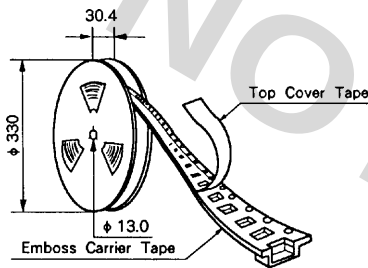
- Taping standards : JIS C 0806 and RC - 1009B (EIAJ)
- Tape type : TB2416 or TE2416
- Reel type : R24D
- Quantity of 1 reel : 500 pieces

- Packing orientation code : B

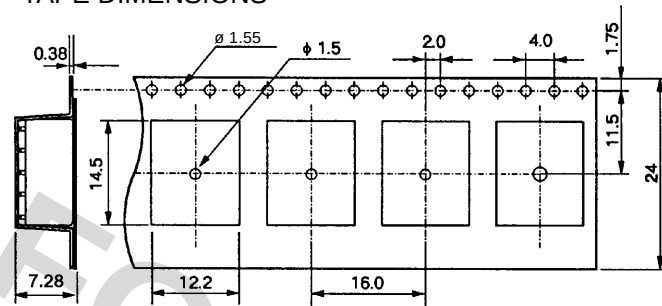


### (2) DIMENSIONS (in mm)

#### • REEL DIMENSIONS



#### • TAPE DIMENSIONS



Note: Relays are sold in packs of 500 pieces, please order 500 pieces as one unit.

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