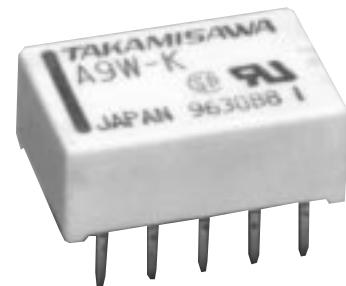


# MINIATURE RELAY

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

**RoHS Compliant****■ FEATURES**

- Extremely low profile and light weight
  - Height: 5 mm
  - Weight: approximately 1.2 g
- UL, CSA recognized
- Conforms to FCC rules and regulations part 68
  - Surge strength 1,500 V
- High reliability—bifurcated contacts
- Wide operating range
- DIL pitch terminals
- Plastic sealed type
- Latching version available
- RoHS compliant since date code: 0437B8  
Please see page 7 for more information

**■ ORDERING INFORMATION**

[Example] 

A	L	-	D	12	W	-	K
(a)	(b)	(*)	(c)	(d)	(e)	(f)	

(a)	Series Name	A : A 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**

UL478, 508 (File No. E45026)

C22.2 No. 14 (File No. LR35579)

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

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

## ■ SPECIFICATIONS

Item		Standard Type	Single Winding Latching Type	Double Winding Latching Type
		A-( ) W-K	AL-( ) W-K	AL-D ( ) W-K
Contact	Arrangement	2 form C (DPDT)		
	Material	Gold overlay silver alloy		
	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 0.85 W	0.15 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	1,000 VAC 1 minute	
	Surge Strength		1,500 V (between coil and contacts)	
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 1.2 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.

# A 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	A-1.5W-K	1.5 VDC	16.1Ω	+1.13 VDC	+0.15 VDC 140 mW
	A- 3 W-K	3 VDC	64.3Ω	+2.25 VDC	+0.3 VDC 140 mW
	A-4.5W-K	4.5 VDC	145Ω	+3.38 VDC	+0.45 VDC 140 mW
	A- 5 W-K	5 VDC	178Ω	+3.75 VDC	+0.5 VDC 140 mW
	A- 6 W-K	6 VDC	257Ω	+4.5 VDC	+0.6 VDC 140 mW
	A- 9 W-K	9 VDC	579Ω	+6.75 VDC	+0.9 VDC 140 mW
	A-12 W-K	12 VDC	1,028Ω	+9.0 VDC	+1.2 VDC 140 mW
	A-18 W-K	18 VDC	1,620Ω	+13.5 VDC	+1.8 VDC 200 mW
	A-24 W-K	24 VDC	2,880Ω	+18.0 VDC	+2.4 VDC 200 mW
	A-48 W-K	48 VDC	7,680Ω	+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.

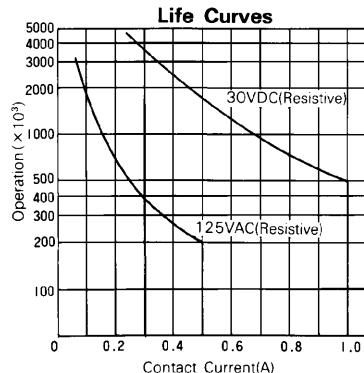
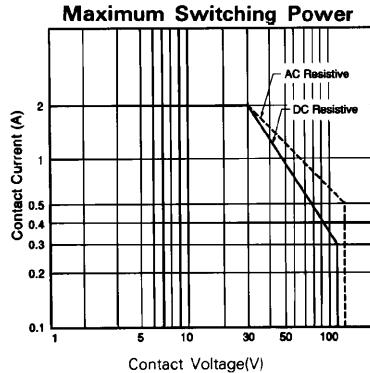
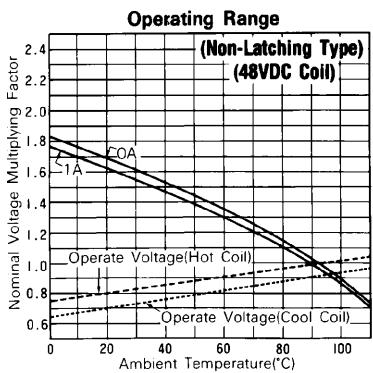
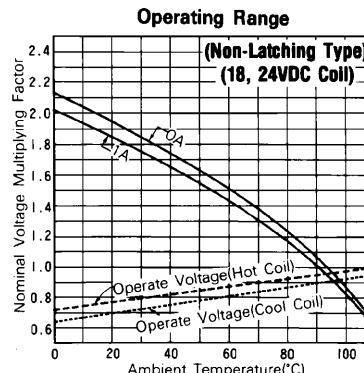
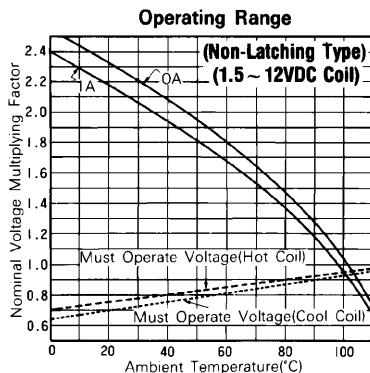
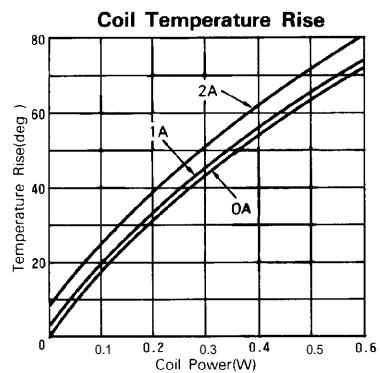
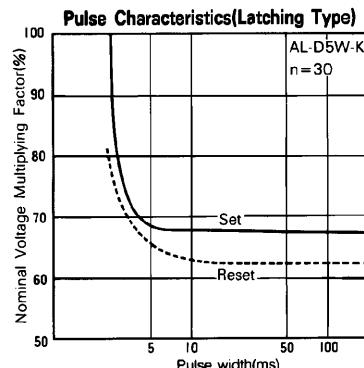
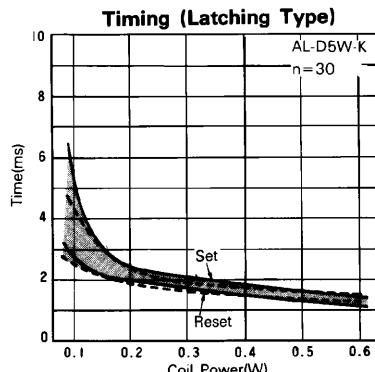
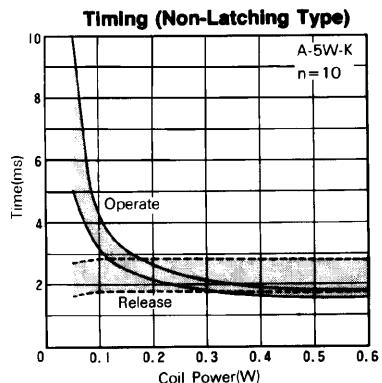
MODEL	Nominal voltage	Coil resistance ( $\pm 10\%$ )	Set voltage <sup>*1</sup>	Reset voltage <sup>*1</sup>	Nominal power
Single Winding Latching Type	AL-1.5W-K	1.5 VDC	22.5Ω	+1.13 VDC	-1.05 VDC 100 mW
	AL- 3 W-K	3 VDC	90Ω	+2.25 VDC	-2.1 VDC 100 mW
	AL-4.5W-K	4.5 VDC	203Ω	+3.38 VDC	-3.15 VDC 100 mW
	AL- 5 W-K	5 VDC	250Ω	+3.75 VDC	-3.5 VDC 100 mW
	AL- 6 W-K	6 VDC	360Ω	+4.5 VDC	-4.2 VDC 100 mW
	AL- 9 W-K	9 VDC	810Ω	+6.75 VDC	-6.3 VDC 100 mW
	AL-12 W-K	12 VDC	1,440Ω	+9.0 VDC	-8.4 VDC 100 mW
	AL-18 W-K	18 VDC	2,160Ω	+13.5 VDC	-12.6 VDC 150 mW
	AL-24 W-K	24 VDC	3,840Ω	+18.0 VDC	-16.8 VDC 150 mW
	AL-D1.5W-K	1.5 VDC	P 11.25Ω S 11.25Ω	+1.13 VDC +1.05 VDC	200 mW
Double Winding Latching Type	AL-D 3 W-K	3 VDC	P 45Ω S 45Ω	+2.25 VDC +2.1 VDC	200 mW
	AL-D4.5W-K	4.5 VDC	P 101Ω S 101Ω	+3.38 VDC +3.15 VDC	200 mW
	AL-D 5 W-K	5 VDC	P 125Ω S 125Ω	+3.75 VDC +3.5 VDC	200 mW
	AL-D 6 W-K	6 VDC	P 180Ω S 180Ω	+4.50 VDC +4.2 VDC	200 mW
	AL-D 9 W-K	9 VDC	P 405Ω S 405Ω	+6.75 VDC +6.3 VDC	200 mW
	AL-D12 W-K	12 VDC	P 720Ω S 720Ω	+9.0 VDC +8.4 VDC	200 mW
	AL-D18 W-K	18 VDC	P 1,080Ω S 1,080Ω	+13.5 VDC +12.6 VDC	300 mW
	AL-D24 W-K	24 VDC	P 1,920Ω S 1,920Ω	+18.0 VDC +16.8 VDC	300 mW

Note: \*<sup>1</sup> Specified values are subject to pulse wave voltage.

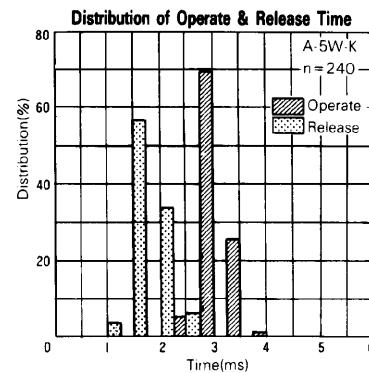
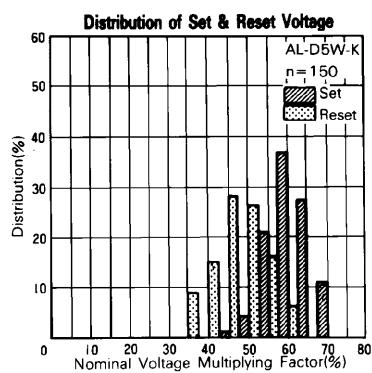
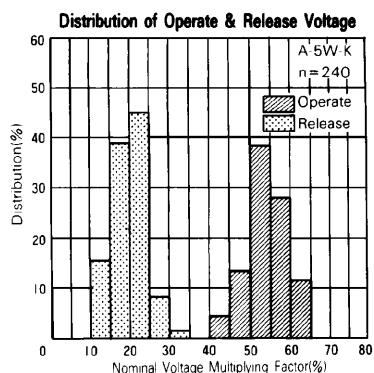
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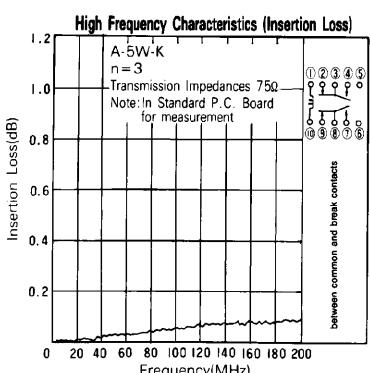
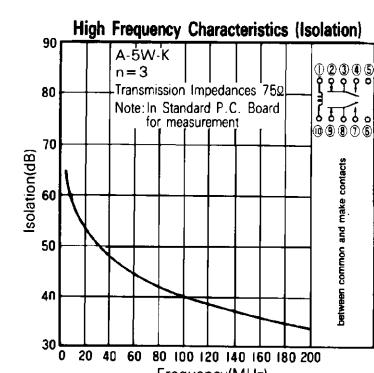
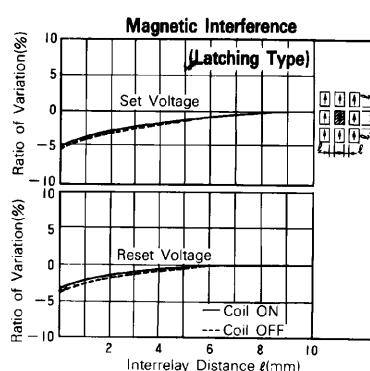
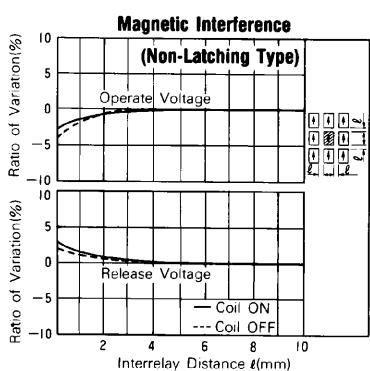
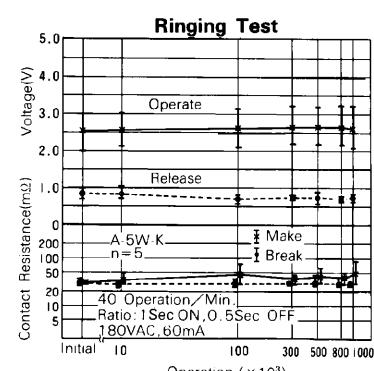
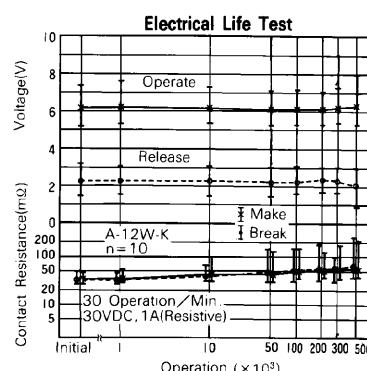
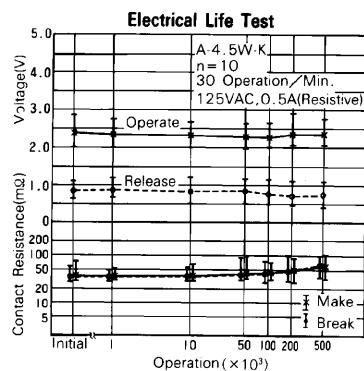
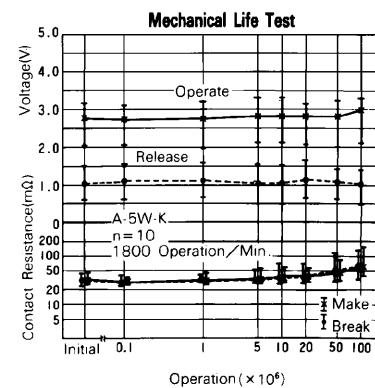
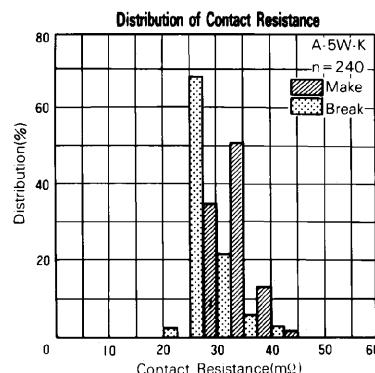
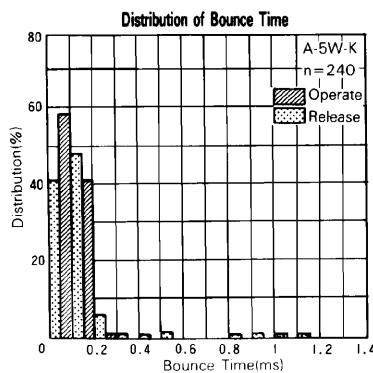
P: Primary coil S: Secondary coil

## ■ CHARACTERISTIC DATA



## ■ REFERENCE DATA

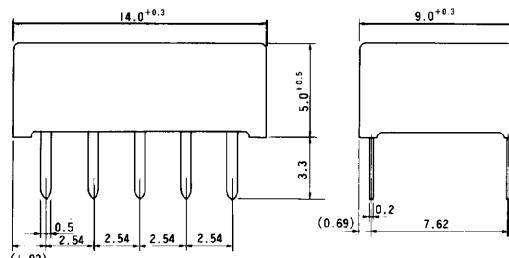




## ■ DIMENSIONS

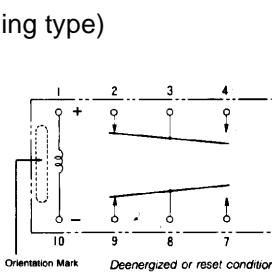
### ● Dimensions

A, AL type (Non-latching type, single winding latching type)



### ● Schematics

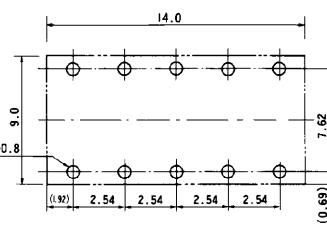
(Bottom View)



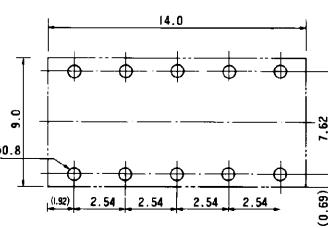
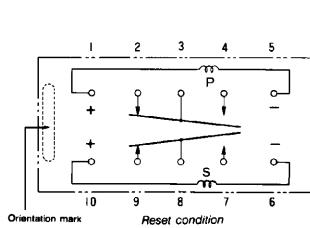
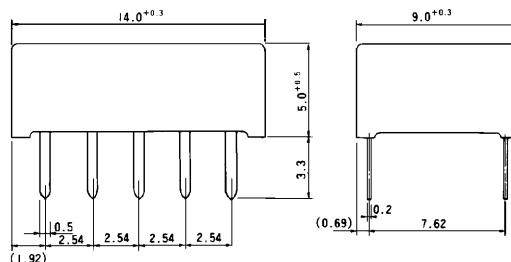
### ● PC board mounting

hole layout

(Bottom View)



AL-D type (Double winding latching type)



Unit: mm

# RoHS Compliance and Lead Free Relay Information

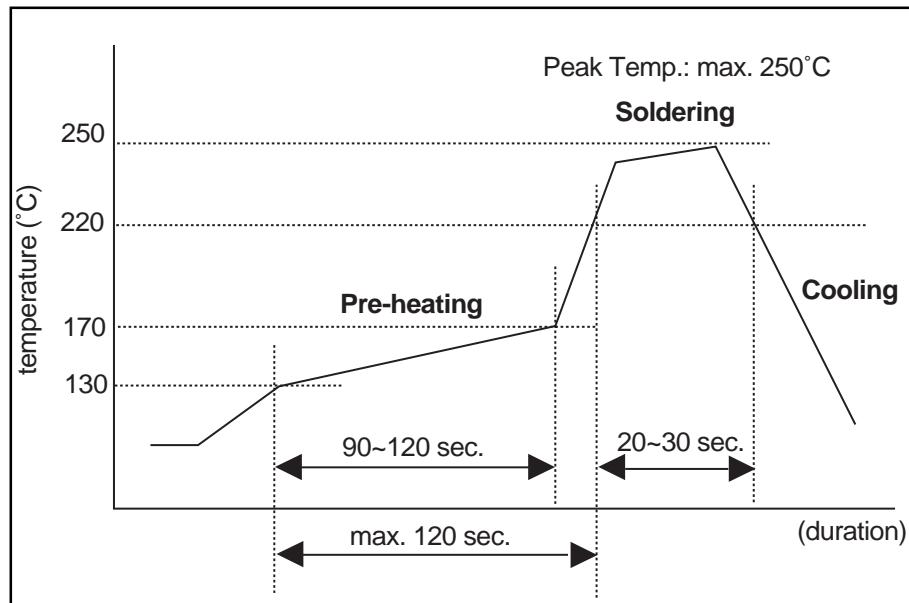
## 1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. Most of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fcaj.fujitsu.com/pdf/LeadFreeLetter.pdf>)
- Lead free solder paste used in relays is Sn-3.0Ag-0.5Cu
- Most signal and some power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 6 hazardous materials that are restricted by RoHS directive (lead, mercury, cadmium, chromium IV, PBB, PBDE). It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- “LF” is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office. We will ship leaded relays as long as the leaded relay inventory exists.

## 2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu

### Reflow Solder condition



### Flow Solder condition:

Pre-heating: maximum 120°C  
 Soldering: dip within 5 sec. at 260°C solder bath

### Solder by Soldering Iron:

Soldering Iron  
 Temperature: maximum 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.

## 4. Tin Whisker

- SnAgCu solder is known as low risk of tin whisker. No considerable length whisker was found by our in-house test.

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