

# MINIATURE RELAY

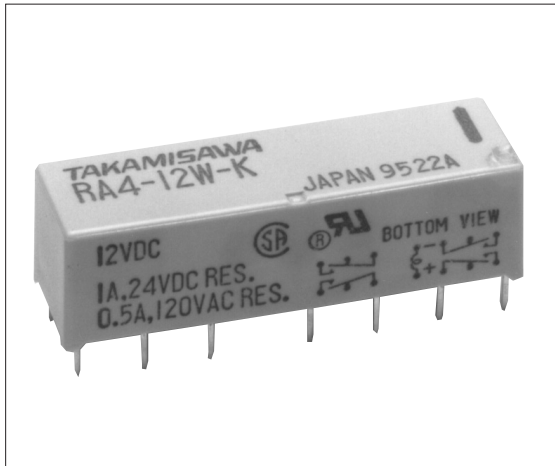
## 4 POLES—1 to 2 A (FOR SIGNAL SWITCHING)

### RA4 SERIES

RoHS compliant

#### ■ FEATURES

- Ultra high sensitivity
- High reliability-bifurcated contacts
- Conforms to FCC rules and regulations Part 68
  - Dielectric strength 1,500 VAC between coil and contacts
  - Surge strength 1,500 V
- UL, CSA recognized
- Wide operating range
- DIL pitch terminals
- Plastic sealed type
- Latching type available
- RoHS compliant since date code: 0418H  
Please see page 7 for more information



#### ■ ORDERING INFORMATION

RA4 L - D 12 W - K  
 [Example] (a) (b) (c) (d) (e) (f)

(a)	Series Name	RA4 : RA4 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: For movable and stationary contact with gold overlay type, add suffix “-OH”.

# RA4 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	RA4-1.5 W-K	1.5 VDC	11 $\Omega$	+1.0 VDC	+0.15 VDC	200 mW
	RA4- 3 W-K	3 VDC	45 $\Omega$	+2.1 VDC	+0.3 VDC	200 mW
	RA4-4.5 W-K	4.5 VDC	100 $\Omega$	+3.1 VDC	+0.45 VDC	200 mW
	RA4- 5 W-K	5 VDC	125 $\Omega$	+3.5 VDC	+0.5 VDC	200 mW
	RA4- 6 W-K	6 VDC	180 $\Omega$	+4.2 VDC	+0.6 VDC	200 mW
	RA4- 9 W-K	9 VDC	405 $\Omega$	+6.3 VDC	+0.9 VDC	200 mW
	RA4- 12 W-K	12 VDC	720 $\Omega$	+8.4 VDC	+1.2 VDC	200 mW
	RA4- 18 W-K	18 VDC	1,620 $\Omega$	+12.6 VDC	+1.8 VDC	200 mW
	RA4- 24 W-K	24 VDC	2,880 $\Omega$	+16.8 VDC	+2.4 VDC	200 mW
	RA4- 48 W-K	48 VDC	11,520 $\Omega$	+33.6 VDC	+4.8 VDC	200 mW

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

# RA4 SERIES

## COIL DATA CHART

MODEL		Nominal voltage	Coil resistance ( $\pm 10\%$ )	Set voltage* <sup>1</sup>	Reset voltage* <sup>1</sup>	Nominal power
Single Winding Latching Type	RA4L-1.5 W-K	1.5 VDC	25 $\Omega$	+1.0 VDC	-1.0 VDC	90 mW
	RA4L- 3 W-K	3 VDC	100 $\Omega$	+2.1 VDC	-2.1 VDC	90 mW
	RA4L-4.5 W-K	4.5 VDC	225 $\Omega$	+3.1 VDC	-3.1 VDC	90 mW
	RA4L- 5 W-K	5 VDC	278 $\Omega$	+3.5 VDC	-3.5 VDC	90 mW
	RA4L- 6 W-K	6 VDC	400 $\Omega$	+4.2 VDC	-4.2 VDC	90 mW
	RA4L- 9 W-K	9 VDC	900 $\Omega$	+6.3 VDC	-6.3 VDC	90 mW
	RA4L- 12 W-K	12 VDC	1,600 $\Omega$	+8.4 VDC	-8.4 VDC	90 mW
	RA4L- 18 W-K	18 VDC	3,600 $\Omega$	+12.6 VDC	-12.6 VDC	90 mW
	RA4L- 24 W-K	24 VDC	6,400 $\Omega$	+16.8 VDC	-16.8 VDC	90 mW
	RA4L- 48 W-K	48 VDC	25,600 $\Omega$	+33.6 VDC	-33.6 VDC	90 mW
Double Winding Latching Type	RA4L-D1.5 W-K	1.5 VDC	P 12.5 $\Omega$	+1.0 VDC		180 mW
			S 12.5 $\Omega$		+1.0 VDC	
	RA4L-D 3 W-K	3 VDC	P 50 $\Omega$	+2.1 VDC		180 mW
			S 50 $\Omega$		+2.1 VDC	
	RA4L-D4.5 W-K	4.5 VDC	P 113 $\Omega$	+3.1 VDC		180 mW
			S 113 $\Omega$		+3.1 VDC	
	RA4L-D 5 W-K	5 VDC	P 139 $\Omega$	+3.5 VDC		180 mW
			S 139 $\Omega$		+3.5 VDC	
	RA4L-D 6 W-K	6 VDC	P 200 $\Omega$	+4.2 VDC		180 mW
			S 200 $\Omega$		+4.2 VDC	
	RA4L-D 9 W-K	9 VDC	P 450 $\Omega$	+6.3 VDC		180 mW
			S 450 $\Omega$		+6.3 VDC	
	RA4L-D 12 W-K	12 VDC	P 800 $\Omega$	+8.4 VDC		180 mW
			S 800 $\Omega$		+8.4 VDC	
	RA4L-D 18 W-K	18 VDC	P 1,800 $\Omega$	+12.6 VDC		180 mW
			S 1,800 $\Omega$		+12.6 VDC	
	RA4L-D 24 W-K	24 VDC	P 3,200 $\Omega$	+16.8 VDC		180 mW
			S 3,200 $\Omega$		+16.8 VDC	
RA4L-D 48 W-K	48 VDC	P 12,800 $\Omega$	+33.6 VDC		180 mW	
		S 12,800 $\Omega$		+33.6 VDC		

P: Primary coil S: Secondary coil

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

# RA4 SERIES

## ■ SPECIFICATIONS

Item		Standard Type	Single Winding Latching Type	Double Winding Latching Type
		RA4-( ) W-K	RA4L-( ) W-K	RA4L-D ( ) W-K
Contact	Arrangement	4 form C (4PDT)		
	Material	Gold overlay silver palladium		
	Style	Bifurcated (cross bar)		
	Resistance (initial)	Maximum 100 mΩ (at 1 A 6 VDC)		
	Rating (resistive)	0.5 A 120 VAC or 1 A 24 VDC		
	Maximum Carrying Current	2 A		
	Maximum Switching Power	60 VA, 24 W		
	Maximum Switching Voltage	250 VAC, 220 VDC		
	Maximum Switching Current	2 A		
	Minimum Switching Load*1	0.01 mA 10 mVDC		
	Capacitance (10 MHz)	Approximately 1.4 pF (between open contacts), 1.3 pF (adjacent contacts) Approximately 2.4 pF (between coil and contacts)		
Coil	Nominal Power (at 20°C)	200 mW	90 mW	180 mW
	Operate Power (at 20°C)	100 mW	45 mW	90 mW
	Operating Temperature	-40°C to +80°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)	
Life	Mechanical	2 × 10 <sup>7</sup> operations minimum		
	Electrical	2 × 10 <sup>5</sup> ops. min. (0.5 A 120 VAC), 5 × 10 <sup>5</sup> ops. min. (1 A 24 VDC)		
Other	Vibration Misoperation	10 to 55 Hz (double amplitude of 3.3 mm)		
	Resistance Endurance	10 to 55 Hz (double amplitude of 5.0 mm)		
	Shock Misoperation	300 m/s <sup>2</sup> (11 ±1 ms)		
	Resistance Endurance	1,000 m/s <sup>2</sup> ( 6 ±1 ms)		
	Weight	Approximately 6.4 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.

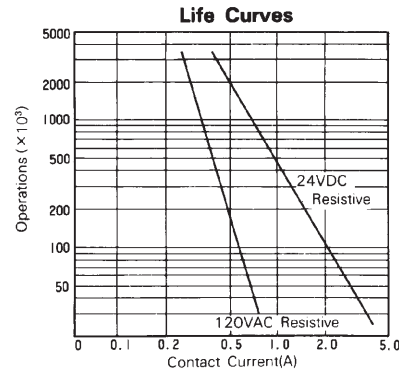
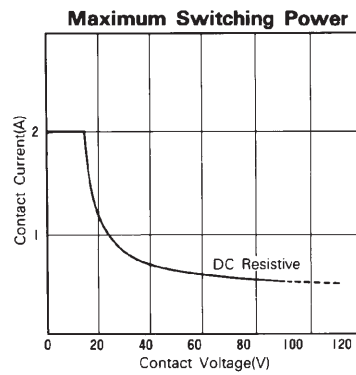
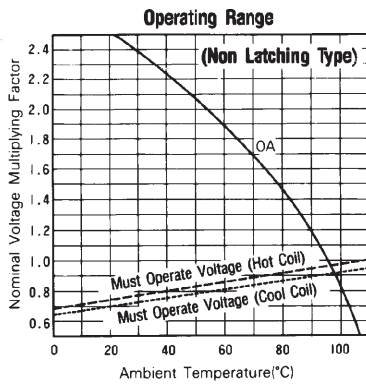
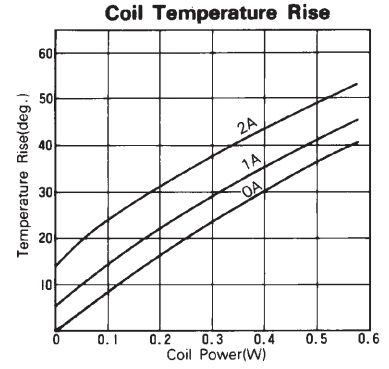
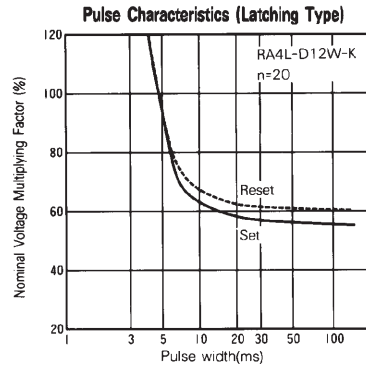
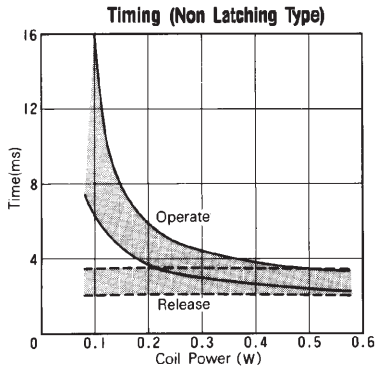
## ■ INSULATION

Item	Standard	Single latch	Double latch
Isolation (initial)	Minimum 1,000 MΩ (at 500VDC)		
Dielectric Strength	open contacts	1,500VAC 1 min.	
	coil and contacts/ adjacent contact	1,500VAC 1 min.	
Surge Voltage	1500V (coil-contact) (10/160 μs standard wave)		

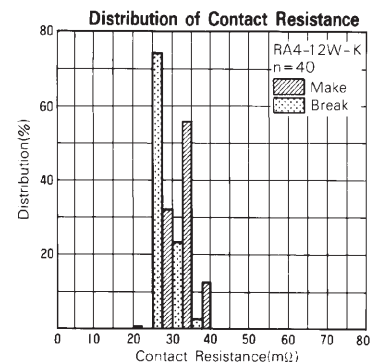
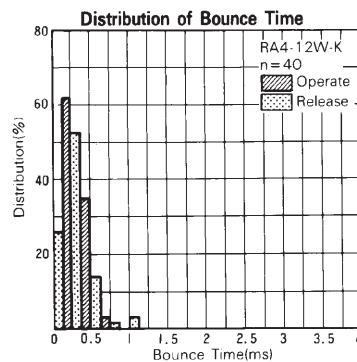
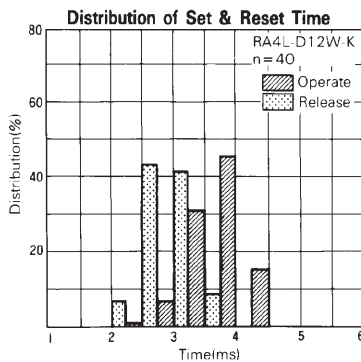
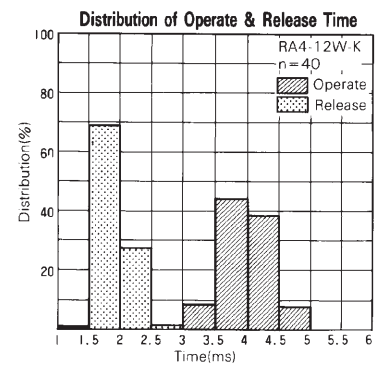
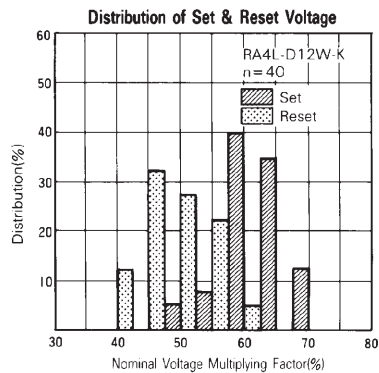
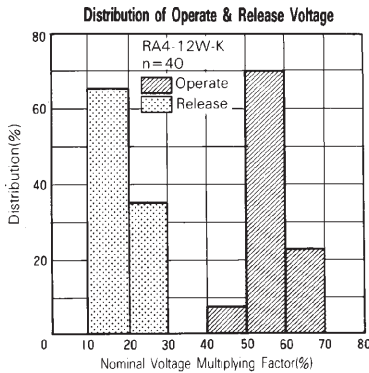
## ■ SAFETY STANDARDS

Type	Compliance	Contact rating
UL	UL 478, UL 508 E 45026	Flammability: UL 94-V0 (plastics) 0.5A, 120VAC (resistive) 2A, 30VDC (resistive) 0.5A, 60VDC (resistive)
CSA	C22.2 No. 14 LR 35579	

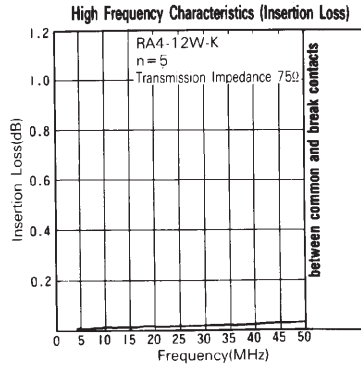
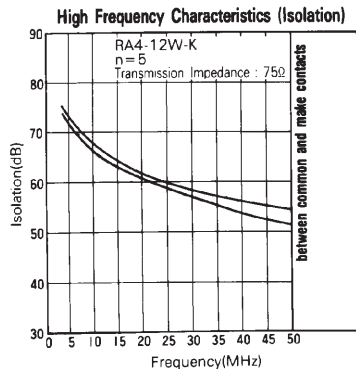
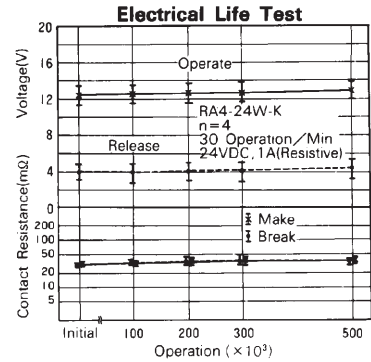
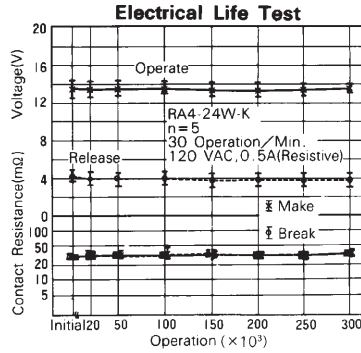
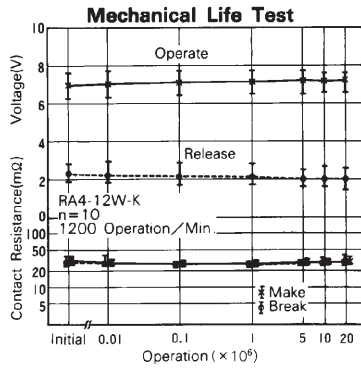
## CHARACTERISTIC DATA



## REFERENCE DATA



# RA4 SERIES



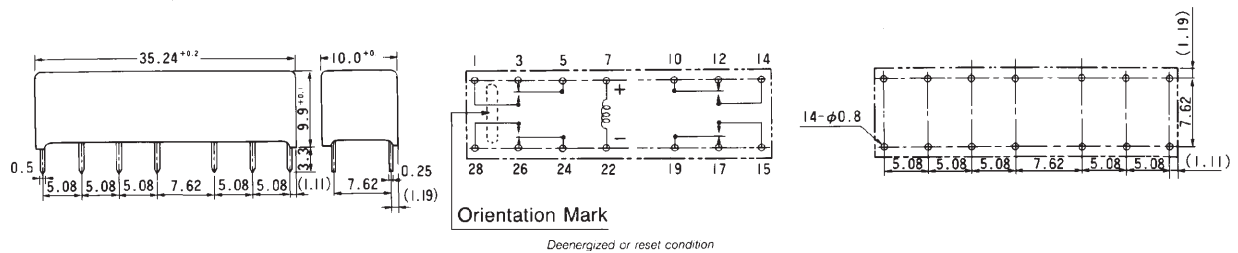
## ■ DIMENSIONS

- Dimensions

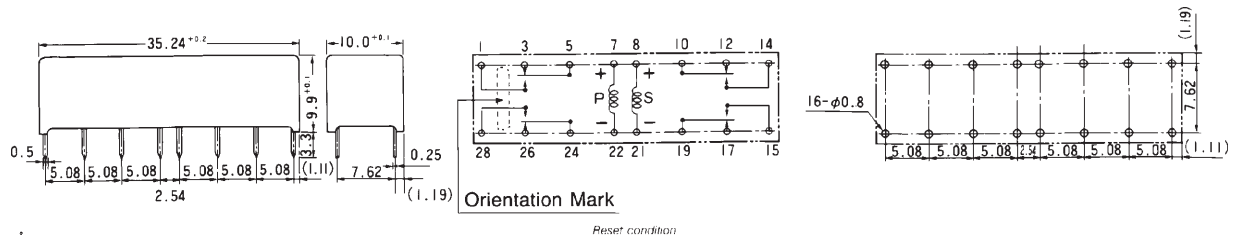
- Schematics (Bottom View)

- PC board mounting hole layout (Bottom view)

RA4, RA4L type (Non-latching type, single winding latching type)



RA4L-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.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and most power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, 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.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

### 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

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

## Fujitsu Components International Headquarter Offices

### Japan

Fujitsu Component Limited  
Gotanda-Chuo Building  
3-5, Higashigotanda 2-chome, Shinagawa-ku  
Tokyo 141, Japan  
Tel: (81-3) 5449-7010  
Fax: (81-3) 5449-2626  
Email: [promothq@ft.ed.fujitsu.com](mailto:promothq@ft.ed.fujitsu.com)  
Web: [www.fcl.fujitsu.com](http://www.fcl.fujitsu.com)

### North and South America

Fujitsu Components America, Inc.  
250 E. Caribbean Drive  
Sunnyvale, CA 94089 U.S.A.  
Tel: (1-408) 745-4900  
Fax: (1-408) 745-4970  
Email: [components@us.fujitsu.com](mailto:components@us.fujitsu.com)  
Web: <http://www.fujitsu.com/us/services/edevices/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](mailto:info@fceu.fujitsu.com)  
Web: [emea.fujitsu.com/components/](http://emea.fujitsu.com/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@fcal.fujitsu.com](mailto:fcal@fcal.fujitsu.com)  
Web: <http://www.fujitsu.com/sg/services/micro/components/>

©2008 Fujitsu Components America, Inc. All rights reserved. All trademarks or registered trademarks are the property of their respective owners.

Fujitsu Components America or its affiliates do not warrant that the content of datasheet is error free. In a continuing effort to improve our products Fujitsu Components America, Inc. or its affiliates reserve the right to change specifications/datasheets without prior notice.  
Rev. January 23, 2008.