FUJITSU THE POSSIBILITIES ARE INFINITE

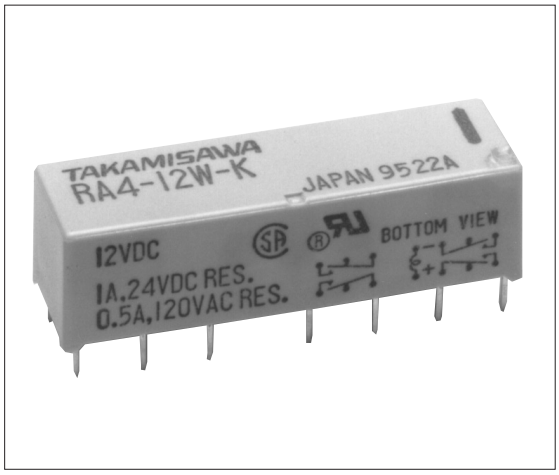
MINIATURE RELAY

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: "18"
  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"".

■ COIL DATA CHART

MODEL		Nominal voltage	Coil resistance (±10%)	Must operate voltage*1	Must release voltage*1	Nominal power
Standard Type	RA4-1.5 W-K	1.5 VDC	11Ω	+1.0 VDC	+0.15 VDC	200 mW
	RA4- 3 W-K	3 VDC	45Ω	+2.1 VDC	+0.3 VDC	200 mW
	RA4-4.5 W-K	4.5 VDC	100Ω	+3.1 VDC	+0.45 VDC	200 mW
	RA- W-K	5 VDC	125Ω	+3.5 VDC	+0.5 VDC	200 mW
	4- W-K	6 VDC	180Ω	+4.2 VDC	+0.6 VDC	200 mW
	RA W	9 VDC	405Ω	+6.3 VDC	+0.9 VDC	200 mW
	RA4- 12 -K	12 VDC	720Ω	+8.4 VDC	+1.2 VDC	200 mW
	RA4- 18 W-K	18 VDC	1,620Ω	+12.6 VDC	+1.8 VDC	200 mW
	RA4- 24 W-K	24 VDC	2,880Ω	+16.8 VDC	+2.4 VDC	200 mW
	RA4- 48 W-K	48 VDC	11,520Ω	+33.6 VDC	+4.8 VDC	200 mW

Note: *1 Specified values are subject to pulse ve voltage.
All values in the table are measured at 20°C

■ COIL DATA CHART

	MODEL	Nominal voltage	Coil resistance (±10%)	Set voltage*1	Reset voltage*1	Nominal power
Single Winding Latching Type	RA4L-1.5 W-K	1.5 VDC	25Ω	+1.0 VDC	–1.0 VDC	90 mW
	RA4L- 3 W-K	3 VDC	100Ω	+2.1 VDC	–2.1 VDC	90 mW
	RA4L-4.5 W-K	4.5 VDC	225Ω	+3.1 VDC	–3.1 VDC	90 mW
	RA4L- -K	5 VDC	278Ω	+3.5 VDC	–3.5 VDC	90 mW
	RA4 6 W	6 VDC	400Ω	+4.2 VDC	–4.2 VDC	90 mW
	R -K	9 VDC	900Ω	+6.3 VDC	–6.3 VDC	90 mW
	RA4L- 12 W	12 VDC	1,600Ω	+8.4 VDC	–8.4 VDC	90 mW
	RA4L- 18 -K	18 VDC	3,600Ω	+12.6 VDC	–12.6 VDC	90 mW
	RA4L- 24 W-K	VDC	6,400Ω	+16.8 VDC	–16.8 VDC	90 mW
	RA4L- 48 W-K	48 VD	25,600Ω	+33.6 VDC	–33.6 VDC	90 mW
Double Winding Latching Type	RA4L-D1.5 W-K	.5 C	P 12.5Ω	+1.0 VDC		180 mW
			12.5Ω		+1.0 VDC	
	RA4L-D 3 W-K	3 VDC	50Ω	+2.1 VDC		180 mW
			50		+2.1 VDC	
	RA4L-D4.5 W-K	4.5 VDC	P Ω	+3.1 VDC		180 mW
			S 113Ω		+3.1 VDC	
	RA4L-D 5 W-K	5 VDC	P 139	+3.5 VDC		180 mW
			S 139Ω		+3.5 VDC	
	RA4L-D 6 W-K	6 VDC	P 200Ω	+4 VDC		180 mW
			S 200Ω		4.2 VDC	
	RA4L-D 9 W-K	9 VDC	P 450Ω	+6.3 VDC		180 mW
			S 450Ω		3 VDC	
	RA4L-D 12 W-K	12 VDC	P 800Ω	+8.4 VDC		180 mW
			S 800Ω		VDC	
	RA4L-D 18 W-K	18 VDC	P 1,800Ω	+12.6 VDC		180 mW
			S 1,800Ω		+12.6 VDC	
	RA4L-D 24 W-K	24 VDC	P 3,200Ω	+16.8 VDC		0 mW
			S 3,200Ω		+16.8 VDC	
	RA4L-D 48 W-K	48 VDC	P 12,800Ω	+33.6 VDC		180 m
			S 12,800Ω		+33.6 VDC	

P: Primary coil S: Secondary coil

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

■ 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)	200 mW	45 mW	90 mW
	Operating Temperature	−40°C to +80°C (no frost) (refer to the CHARATERISTIC DATA)		
Time Value	Operate (at nominal voltage)	Maximum 5 ms	Maximum 6 ms (set)	
	Release (at nominal voltage)	Maximum 4 ms	Maximum 6 ms (reset)	
Life	Mechanical	2×10^7 operations, minimum		
	Electrical	2×10^5 ops. min. (0.5 A 120 VAC), 5×10^5 ops. min. (1 A 24 VDC)		
Other	Vibration Resistance Misoperation	10 to 55 Hz (double amplitude of 3.3 mm)		
	Vibration Resistance Endurance	10 to 55 Hz (double amplitude of 5.0 mm)		
	Shock Resistance Misoperation	300 m/s^2 (11 ±1 ms)		
	Shock Resistance Endurance	1,000 m/s^2 (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

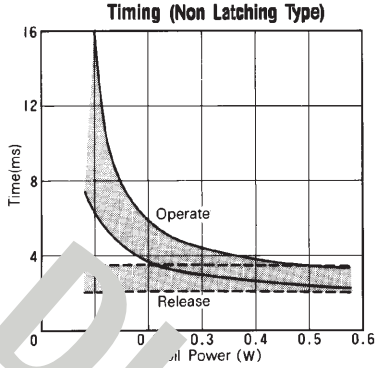
Item		Standard	Single latch	Double latch
Isolation (initial)		Minimum 1,000 MΩ (at 500VDC)		
Dielectric Strength	open contacts	1,500VAC 1 min.		
	coil and contacts/ adjacent contact	1,500VAC 1 min.		
Surge Voltage		1500V (coil-contact) (10/160 μs standard wave)		

■ SAFETY STANDARDS

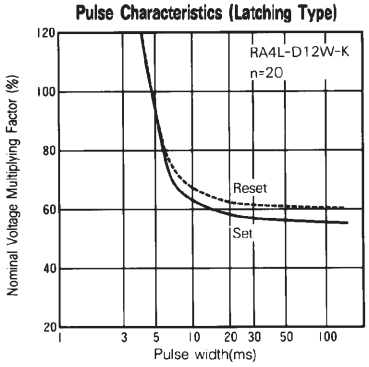
Type	Compliance	Contact rating
UL	UL 478, UL 508 E 45026	Flammability: UL 94-V0 (plastics) 0.5A, 120VAC (resistive) 2A, 30VDC (resistive) 0.5A, 60VDC (resistive)
CSA	C22.2 No. 14 LR 35579	

■ CHARACTERISTIC DATA

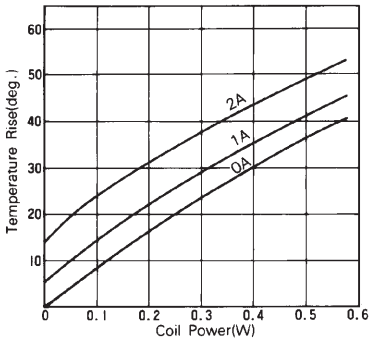
Timing (Non Latching Type)

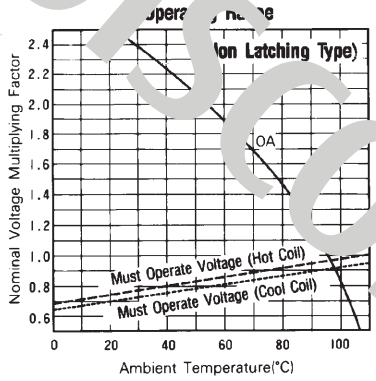


Pulse Characteristics (Latching Type)

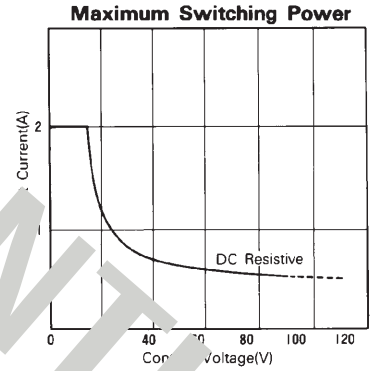


Coil Temperature Rise

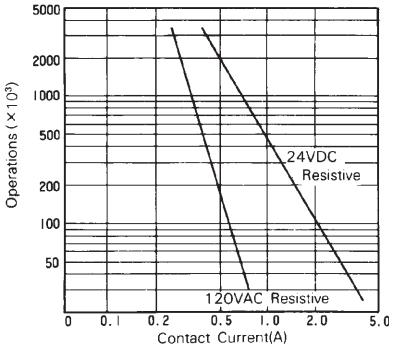




Maximum Switching Power

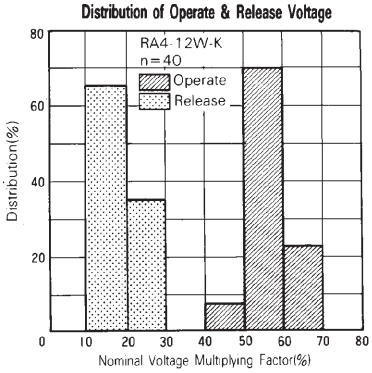


Life Curves

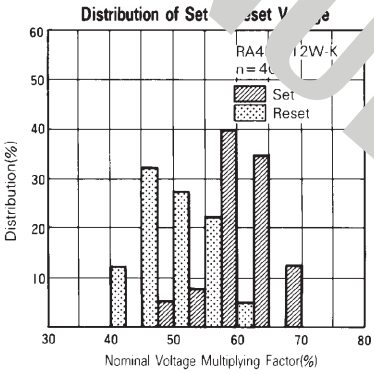


■ REFERENCE DATA

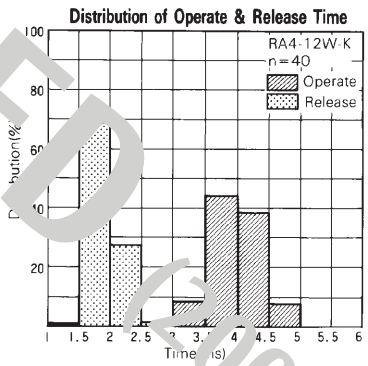
Distribution of Operate & Release Voltage



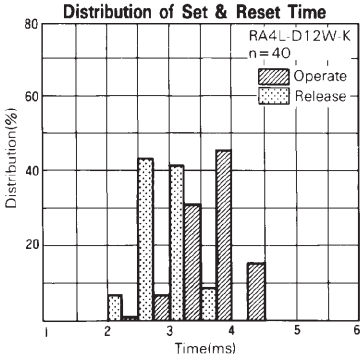
Distribution of Set & Reset Voltage



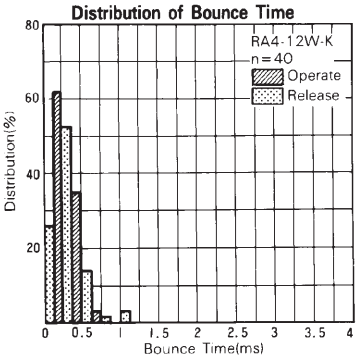
Distribution of Operate & Release Time



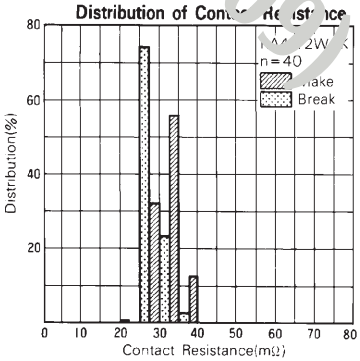
Distribution of Set & Reset Time

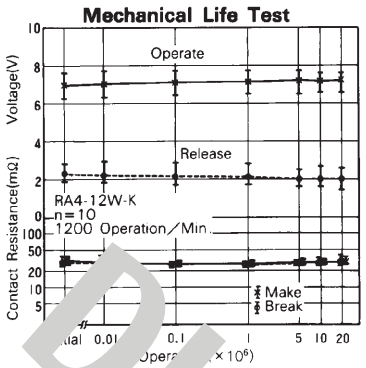


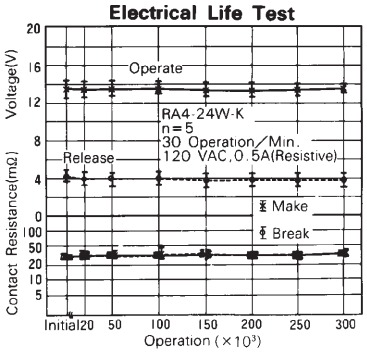
Distribution of Bounce Time

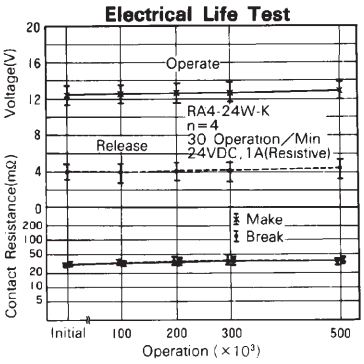


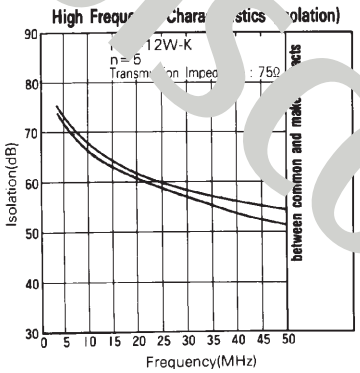
Distribution of Contact Resistance

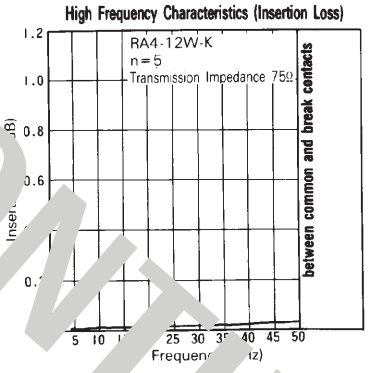








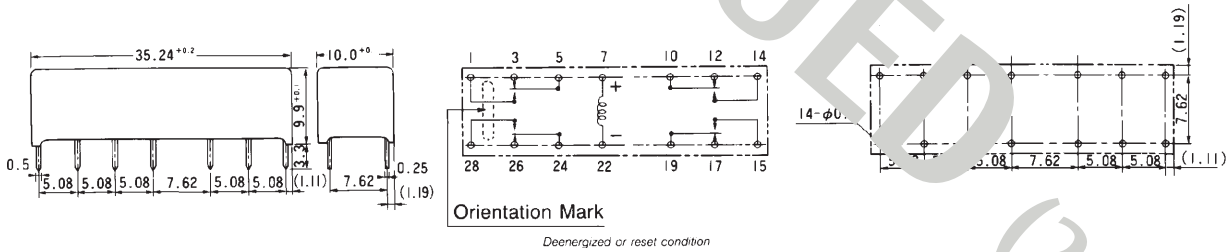




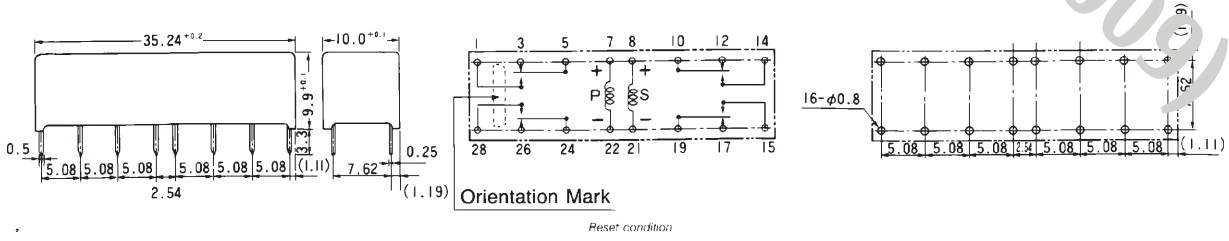
■ DIMENSIONS

- **Dimensions**
- **Schematic** (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 condtion

Flow Solder condtion:

Pre-heating:	maximum 120˚C
Soldering:	dip within 5 sec. at 260˚C soler 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 realys.

4. Tin Whisker

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

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