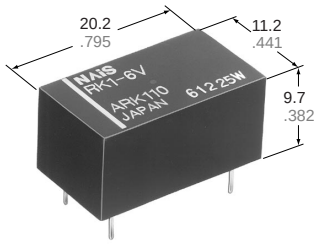
NAiS HIGH FREQUENCY RELAY RK-RELAYS



mm inch

- **Excellent high frequency characteristics**
  Isolation: 60 dB or more (at 1.5 GHz)
  Insertion loss: 0.3 dB or less (at 900 MHz)
- **High sensitivity in small size**
  Size: 20.2 × 11.2 × 9.7 mm .795 × .441 × .382 inch
  Nominal power consumption: 200 mW (single side stable type)
- **Sealed construction for automatic cleaning**
- **Latching types are also available**

SPECIFICATIONS

Contact

Arrangement			1 Form C
Contact material			Gold-clad
Initial contact resistance, max. (By HP4328A)			100 mΩ
Rating	Max. switching power		10 W
	Max. switching voltage		30 V DC
	Max. switching current		0.5 A
	Nominal switching capacity		0.01 A 24 V DC 10 W (at 1.2 GHz, Zo = 50 Ω system)
High frequency characteristics (50 Ω system)	Isolation		Min. 60 dB (at 1.5 GHz)
	Insertion loss		Max. 0.3 dB (at 900 MHz)
	V.S.W.R.		Max. 1.5 (at 900 MHz)
Expected life (min. operations)	Mechanical		5×10^6
	Electrical	0.01 A 24 V DC	3×10^5
		10 W 1.2 GHz	10^5

Coil (at 25°C, 68°F)

	Nominal operating power
Single side stable	200 mW
1 coil latching	200 mW
2 coil latching	400 mW

Characteristics

Initial insulation resistance*1		Min. 100 MΩ at 500 V DC
Initial breakdown voltage*2	Between open contacts	500 Vrms
	Between contact and coil	1,000 Vrms
	Between contact and earth terminal	500 Vrms
Operate time [Set time]*3 (at nominal voltage)		Approx. 6 ms [Approx. 5ms]
Release time (without diode) [Reset time]*3 (at nominal voltage)		Approx. 3 ms [Approx. 5ms]
Temperature rise		Max. 60°Cwith nominal coil voltage across coil and at nominal switching capacity
Shock resistance	Functional*4	Min. 196 m/s² {20 G}
	Destructive*5	Min. 980 m/s² {100 G}
Vibration resistance	Functional*6	10 to 55 Hz at double amplitude of 3 mm
	Destructive	10 to 55 Hz at double amplitude of 5 mm
Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature)	Ambient temp.	–40°C to 60°C –40°F to 140°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 4.4 g .155 oz

Remarks
*1 Measurement at same location as “Initial breakdown voltage” section
*2 Detection current: 10mA
*3 Excluding contact bounce time
*4 Half-wave pulse of sine wave: 11ms, detection time: 10μs
*5 Half-wave pulse of sine wave: 6ms
*6 Detection time: 10μs
*7 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 49)

TYPICAL APPLICATIONS

- Audio visual equipment
  broadcast satellite tuners
  VCRs, CATVs, TVs
- Communication equipment
  automobile telephones
  maritime telephones
- Instrumentation
  test equipment
  measuring equipment

ORDERING INFORMATION

Ex. RK [1] — [L2] — [24V]

Contact arrangement	Operating function	Coil voltage, DC
1: Standard type 1R: R type (See Schematic on next page.)	Nil: Single side stable L: 1 coil latching L2: 2 coil latching	3, 4.5, 5, 6, 9, 12, 24 V

Note: Standard packing; Carton: 50 pcs. Case 500 pcs.

TYPES AND COIL DATA (at 20°C 68°F)

• Single side stable type

Part No.		Nominal voltage, V DC	Pick-up voltage, max. V DC	Drop-out voltage, min. V DC	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Maximum. allowable voltage, V DC (at 60°C)
RK1-3V	RK1R-3V	3	2.25	0.3	45	66.7	200	3.3
RK1-4.5V	RK1R-4.5V	4.5	3.38	0.45	101	44.4	200	4.95
RK1-5V	RK1R-5V	5	3.75	0.5	125	40	200	5.5
RK1-6V	RK1R-6V	6	4.5	0.6	180	33.3	200	6.6
RK1-9V	RK1R-9V	9	6.75	0.9	405	22.2	200	9.9
RK1-12V	RK1R-12V	12	9	1.2	720	16.7	200	13.2
RK1-24V	RK1R-24V	24	18	2.4	2,880	8.3	200	26.4

• 1 coil latching type

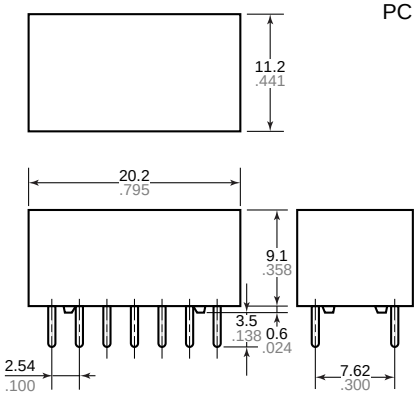
Part No.		Nominal voltage, V DC	Set voltage, max. V DC	Reset voltage, max. V DC	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Maximum. allowable voltage, V DC (at 60°C)
RK1-L-3V	RK1R-L-3V	3	2.25	2.25	45	66.7	200	3.3
RK1-L-4.5V	RK1R-L-4.5V	4.5	3.38	3.38	101	44.4	200	4.95
RK1-L-5V	RK1R-L-5V	5	3.75	3.75	125	40	200	5.5
RK1-L-6V	RK1R-L-6V	6	4.5	4.5	180	33.3	200	6.6
RK1-L-9V	RK1R-L-9V	9	6.75	6.75	405	22.2	200	9.9
RK1-L-12V	RK1R-L-12V	12	9	9	720	16.7	200	13.2
RK1-L-24V	RK1R-L-24V	24	18	18	2,880	8.3	200	26.4

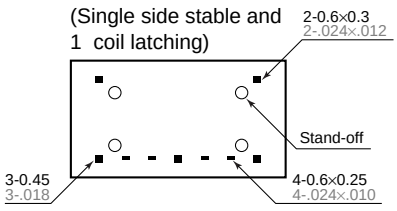
• 2 coil latching type

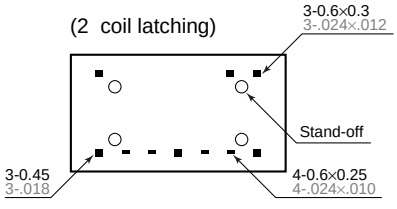
Part No.		Nominal voltage, V DC	Set voltage, max. V DC	Reset voltage, max. V DC	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Maximum. allowable voltage, V DC (at 60°C)
RK1-L2-3V	RK1R-L2-3V	3	2.25	2.25	22.5	133.3	400	3.3
RK1-L2-4.5V	RK1R-L2-4.5V	4.5	3.38	3.38	50.6	88.9	400	4.95
RK1-L2-5V	RK1R-L2-5V	5	3.75	3.75	62.5	80	400	5.5
RK1-L2-6V	RK1R-L2-6V	6	4.5	4.5	90	66.7	400	6.6
RK1-L2-9V	RK1R-L2-9V	9	6.75	6.75	202.5	44.4	400	9.9
RK1-L2-12V	RK1R-L2-12V	12	9	9	360	33.3	400	13.2
RK1-L2-24V	RK1R-L2-24V	24	18	18	1,440	16.7	400	26.4

DIMENSIONS

mm inch

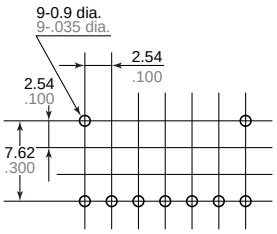


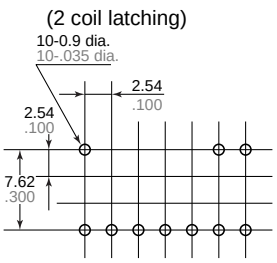




General tolerance: ±0.3 ±.012

PC board pattern (Copper-side view)

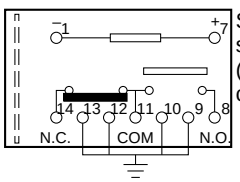




Tolerance: ±0.1 ±.003

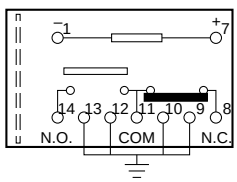
Schematic (Bottom view)

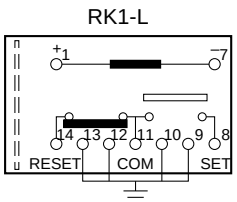
Standard contact arrangement



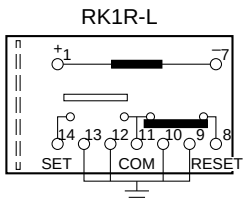
Single side stable (Deenergized condition)

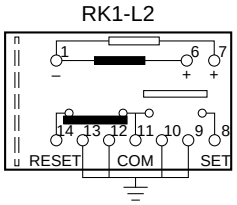
R type contact arrangement



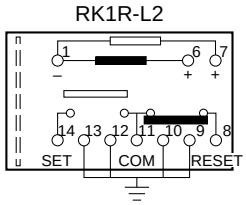


1 coil latching (Reset condition)





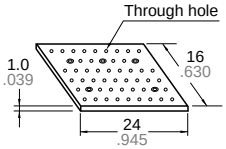
2 coil latching (Reset condition)

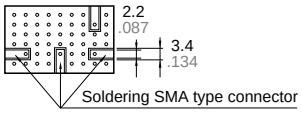


REFERENCE DATA

mm inch

1. High frequency characteristics
Sample: RK1-12V
No. of samples: n = 10 (10 × 2 contacts)

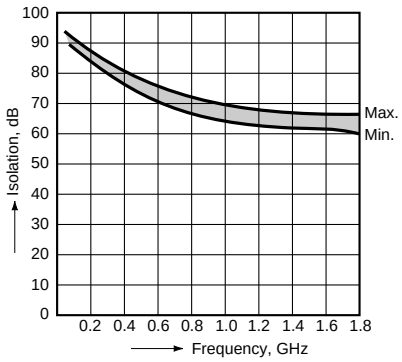




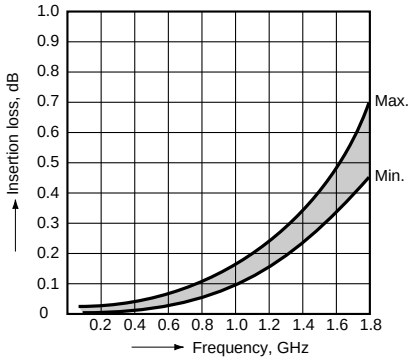
(Wiring diagram)

PC board
- Double-sided through hole
- Material: Glass-epoxy resin

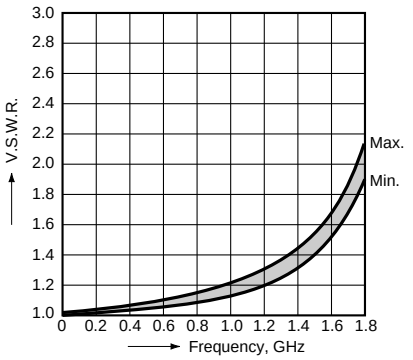
• Isolation



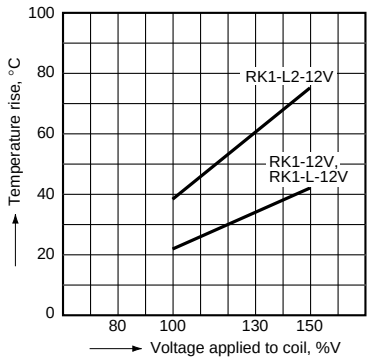
• Insertion loss



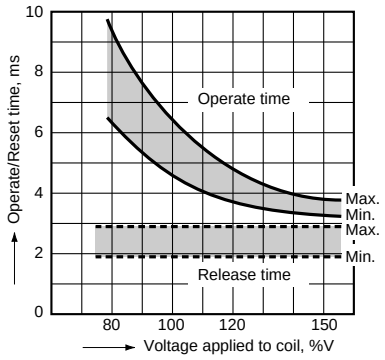
• V.S.W.R.



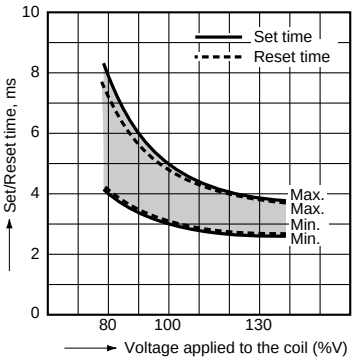
2. Coil temperature rise
Sample: RK1-12V, RK1-L-12V, RK1-L2-12V
No. of samples: n = 6
Carrying current: 10 mA
Ambient temperature: 25°C 77°F



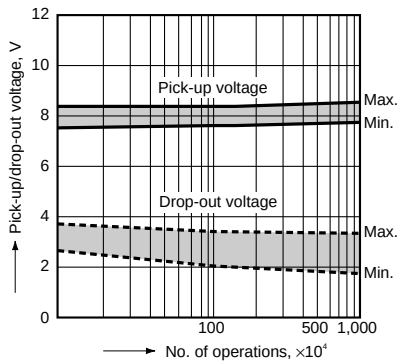
3.-(1) Operate/Release time
(Single side stable)
Sample: RK1-12V; No. of samples: n = 6



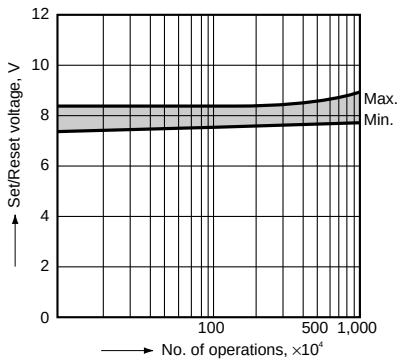
3.-(2) Set/Reset time (Latching)
Sample: RK1-L-12V, RK1-L2-12V
No. of samples: n = 12



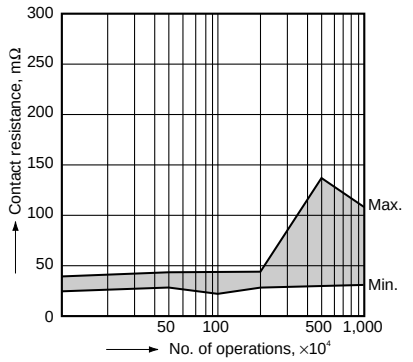
4.-(1) Mechanical life test
(Single side stable)
Sample: RK1-12V; No. of samples: n = 12



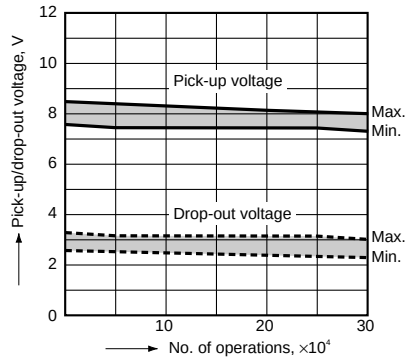
4.-(2) Mechanical life test (Latching)
Sample: RK1-L2-12V
No. of samples: n = 12



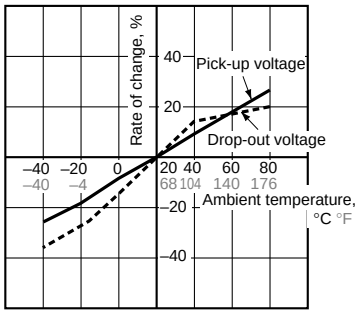
4.-(3) Mechanical life test
Sample: RK1-12V
No. of samples: n = 20 (20 × 2 contacts)



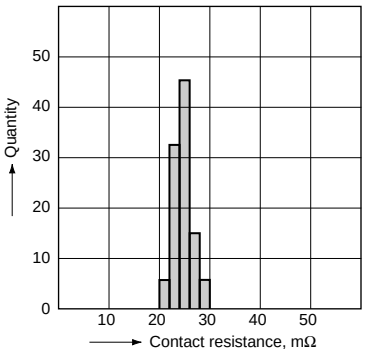
5. Electrical life test (0.01 A 24 V DC)
Sample: RK1-12V; No. of samples: n = 6



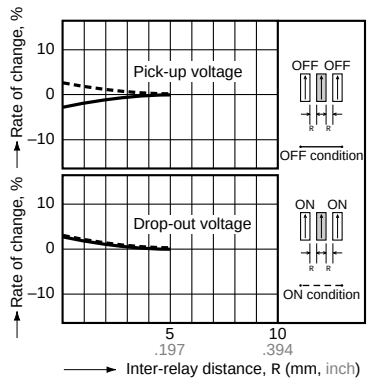
6. Ambient temperature characteristics
Sample: RK1-12V; No. of samples: n = 6



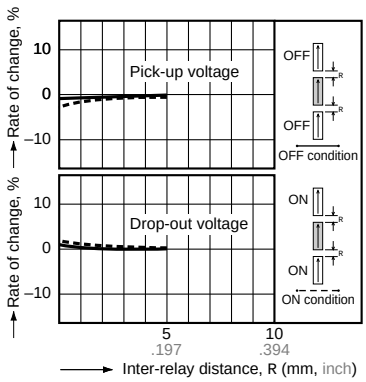
7. Contact resistance deviation (initial)
Sample: RK1-12V
No. of samples: n = 50 (50 × 2 contacts)



8.-(1) Influence of adjacent mounting
Sample: RK1-12V; No. of sample: n = 10



8.-(2) Influence of adjacent mounting
Sample: RK1-12V; No. of samples: n = 10



NOTE

1. Soldering

Perform soldering under the conditions below.

•Within 10 s at 260°C 500°F
•Within 3 s at 350°C 662°F