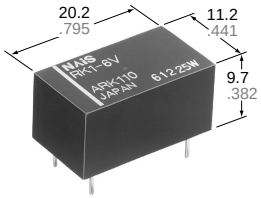
NAiS 1.5 GHz MICROWAVE RELAY RK-RELAYS



mm inch

- **Excellent high frequency characteristics**
  Isolation: Min. 60dB (at 1.5 GHz)
  Insertion loss: Max. 0.3dB (at 900 MHz)
- **V.S.W.R.: Max. 1.5 (at 900MHz)**
- **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, Impedance 50Ω)
High frequency characteristics (Impedance 50Ω)	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 (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

* Specifications will vary with foreign standards certification ratings.
*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

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 ANE 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 140°F)
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 140°F)
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

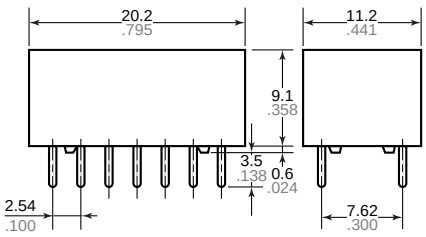
• 2 coil latching type

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 140°F)
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

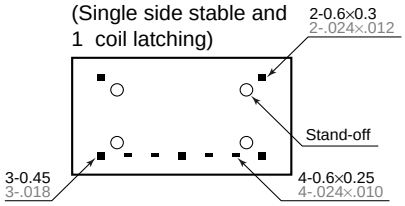
DIMENSIONS

mm inch

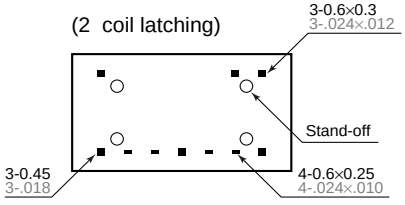
PC board pattern (Copper-side view)



(Single side stable and 1 coil latching)

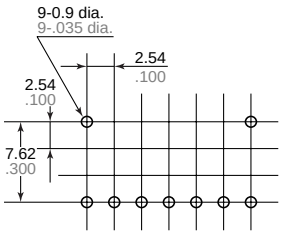


(2 coil latching)

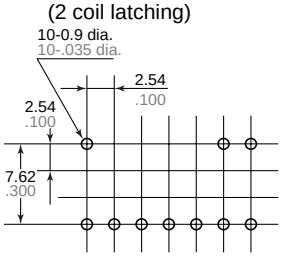


General tolerance: ±0.3 ±.012

(Single side stable and 1 coil latching)



(2 coil latching)

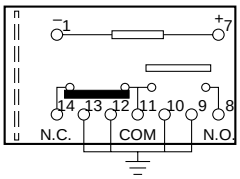


Tolerance: ±0.1 ±.003

Schematic (Bottom view)

Standard contact arrangement

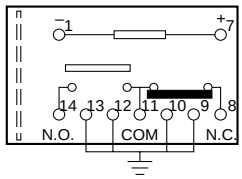
RK1



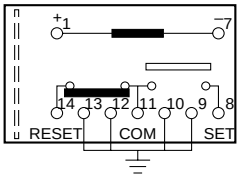
Single side stable (Deenergized condition)

R type contact arrangement

RK1R

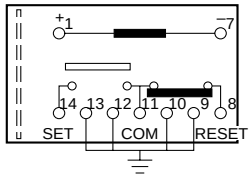


RK1-L

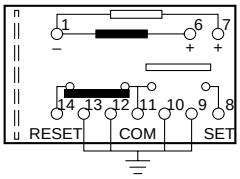


1 coil latching (Reset condition)

RK1R-L

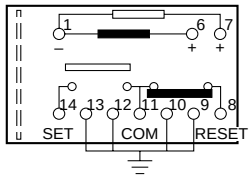


RK1-L2



2 coil latching (Reset condition)

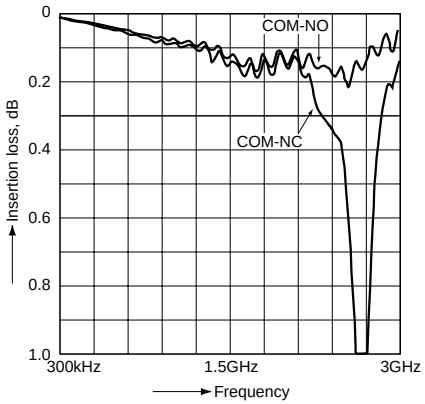
RK1R-L2



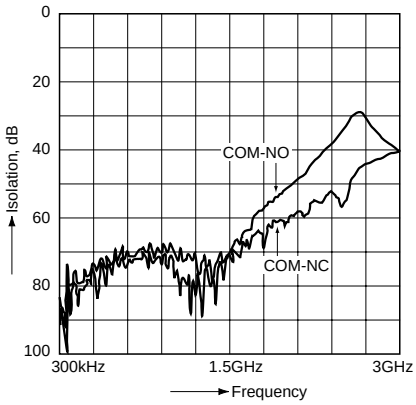
REFERENCE DATA

1.-(1) High frequency characteristics (Impedance 75Ω)
Sample: RK1-12V
Measuring method: Measured with HP network analyzer (HP8753C)

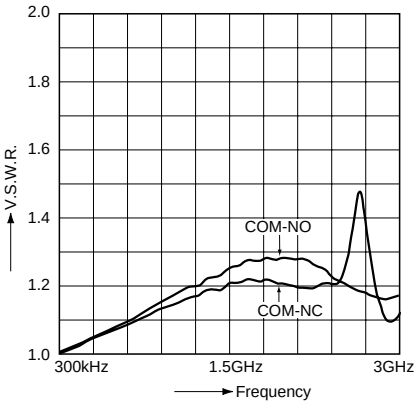
• Insertion loss characteristics



• Isolation characteristics

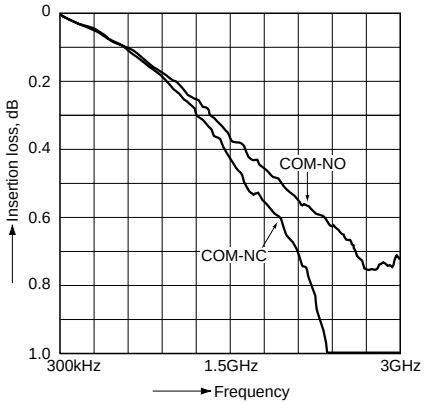


• V.S.W.R. characteristics

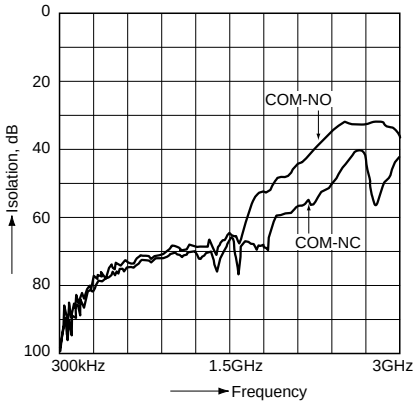


1.-(2) High frequency characteristics (Impedance 50Ω)
Sample: RK1-5V
Measuring method: Measured with HP network analyzer (HP8753C)

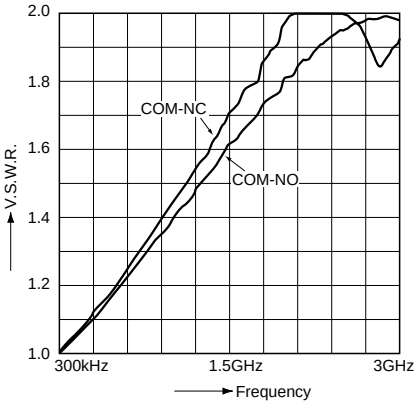
• Insertion loss characteristics



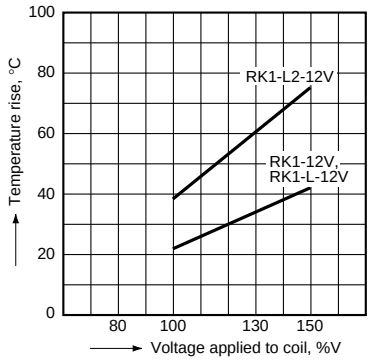
• Isolation characteristics



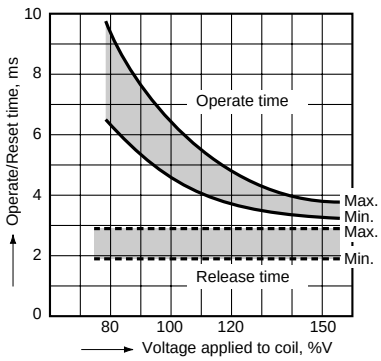
• V.S.W.R. characteristics



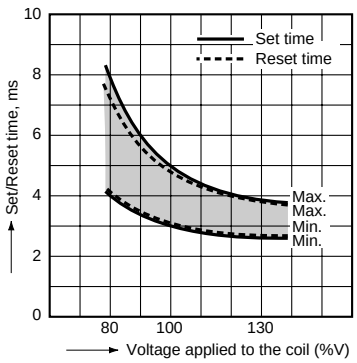
2. Coil temperature rise
Sample: RK1-12V, RK1-L-12V, RK1-L2-12V
No. of samples: n = 6
Carrying current: 10 mA
Ambient temperature: 25°C 77°F



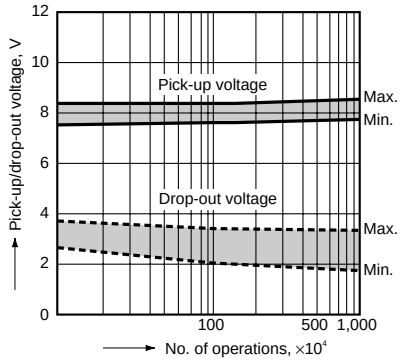
3.-(1) Operate/Release time
(Single side stable)
Sample: RK1-12V; No. of samples: n = 6



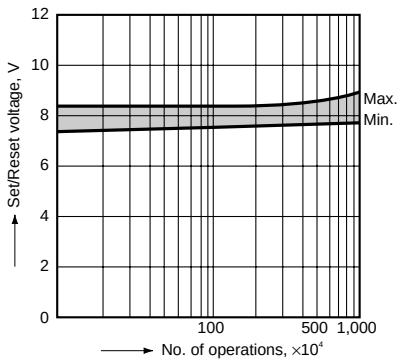
3.-(2) Set/Reset time (Latching)
Sample: RK1-L-12V, RK1-L2-12V
No. of samples: n = 12



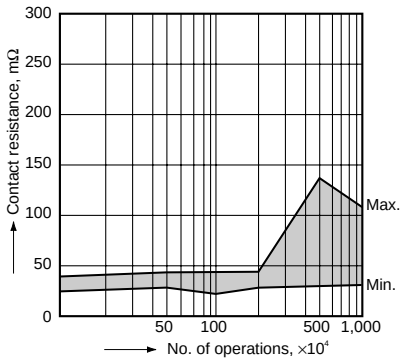
4.-(1) Mechanical life test (Single side stable)
Sample: RK1-12V; No. of samples: n = 12



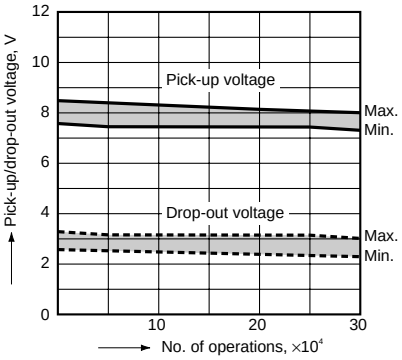
4.-(2) Mechanical life test (Latching)
Sample: RK1-L2-12V
No. of samples: n = 12



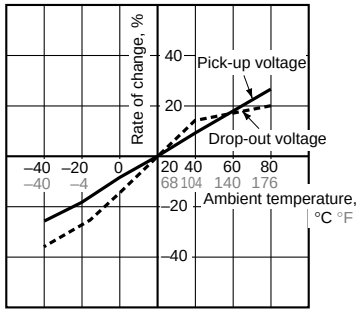
4.-(3) Mechanical life test
Sample: RK1-12V
No. of samples: n = 20 (20 × 2 contacts)



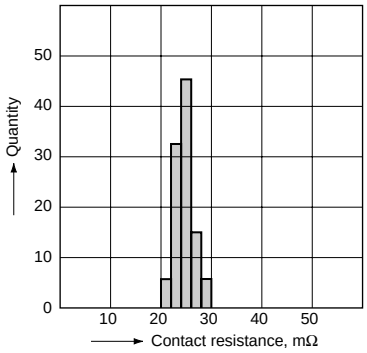
5. Electrical life test (0.01 A 24 V DC)
Sample: RK1-12V; No. of samples: n = 6



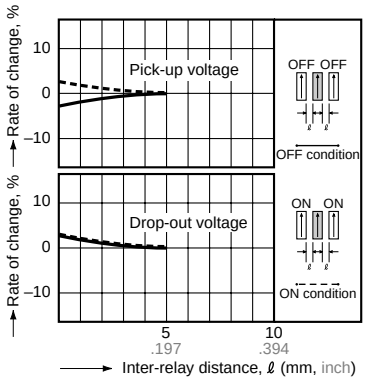
6. Ambient temperature characteristics
Sample: RK1-12V; No. of samples: n = 6



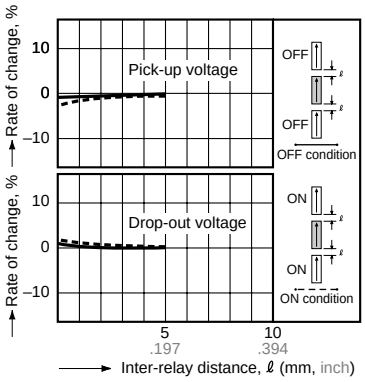
7. Contact resistance distribution (initial)
Sample: RK1-12V
No. of samples: n = 50 (50 × 2 contacts)



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



NOTES

1. Soldering
Perform soldering under the conditions below.
• Within 10 s at 260°C 500°F
• Within 3 s at 350°C 662°F

2. Latching relay
In order to assure proper operating regardless of changes in the ambient usage temperature and usage conditions, nominal operating voltage should be applied to the coil for more than 30 ms to set/reset the latching type relay.

For Cautions for Use, see Relay Technical Information (Page 48 to 76).

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