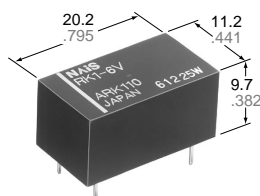


NAIS

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°C with nominal coil voltage across coil and at nominal switching capacity
Shock resistance	Functional* ⁴	Min. 196 m/s ² {20 G}
	Destructive* ⁵	Min. 980 m/s ² {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

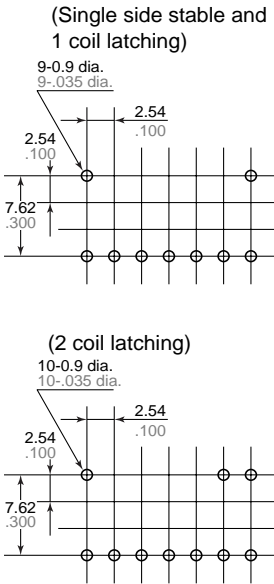
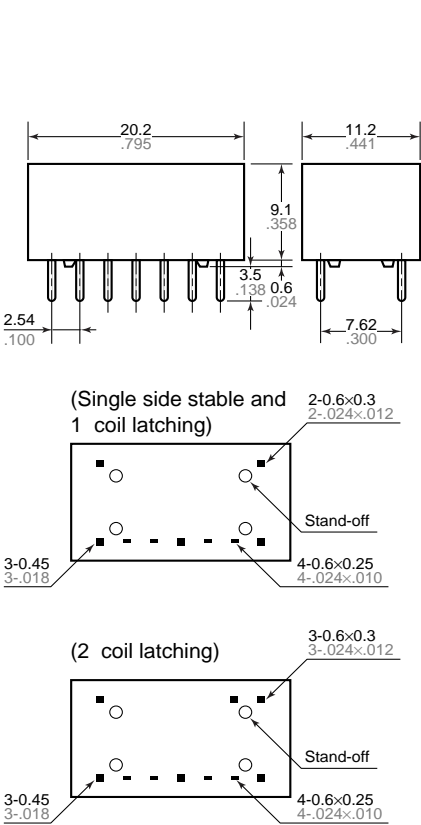
Part No.		Nominal voltage, V DC	Set voltage, max. V DC	Reset voltage, max. V DC	Coil resistance, Ω (±10%)	Nominal operating current, mA	Nominal operating power, mW	Maximum allowable voltage, V DC (at 60°C 140°F)
RK1-L2-3V	RK1R-L2-3V	3	2.25	2.25	22.5	133.3	400	3.3
RK1-L2-4.5V	RK1R-L2-4.5V	4.5	3.38	3.38	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)

Schematic (Bottom view)

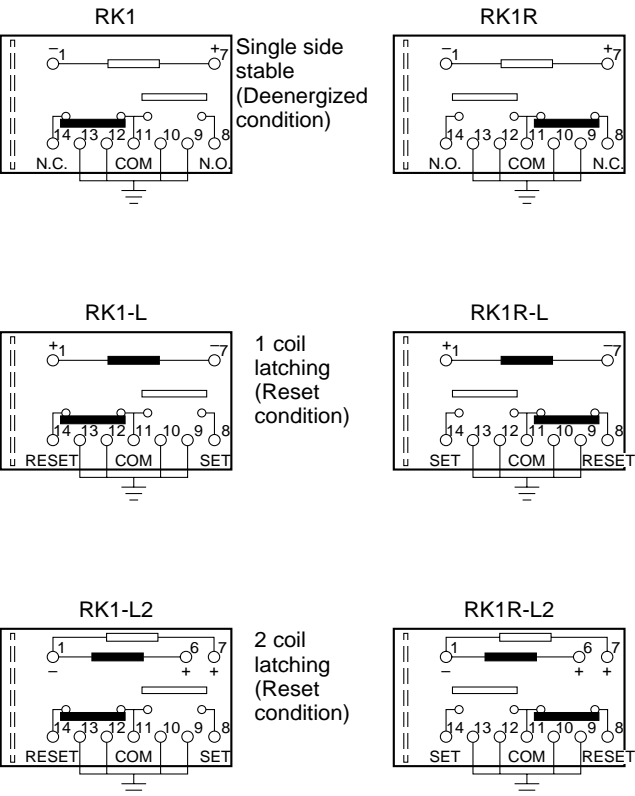


Tolerance: ±0.1 ±.003

General tolerance: ±0.3 ±.012

Standard contact arrangement

R type contact arrangement



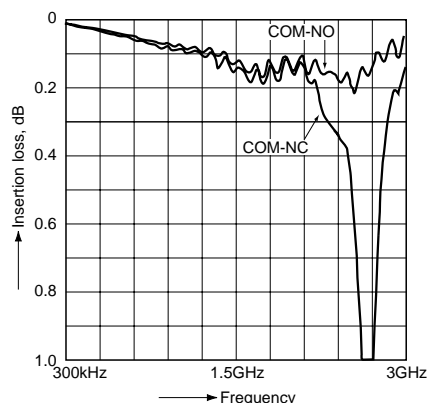
REFERENCE DATA

1.-(1) High frequency characteristics (Impedance 75Ω)

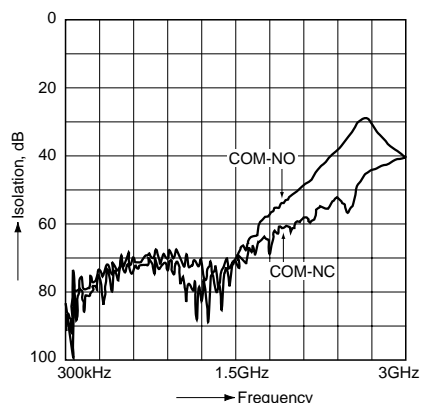
Sample: RK1-12V

Measuring method: Measured with HP network analyzer (HP8753C)

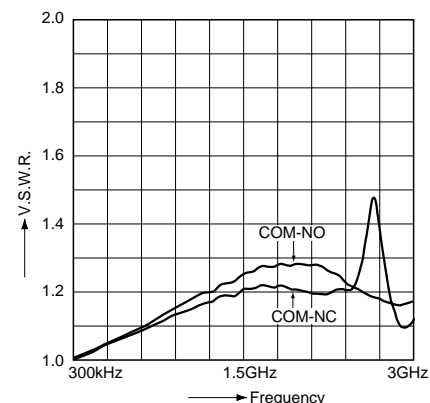
• Insertion loss characteristics



• Isolation characteristics



• V.S.W.R. characteristics

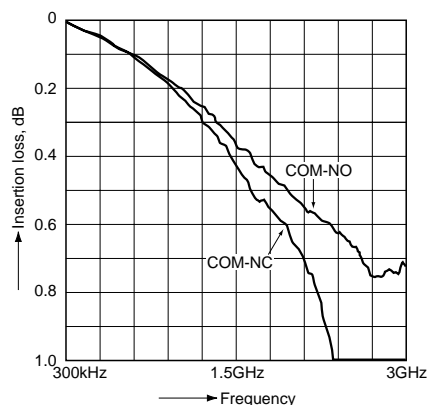


1.-(2) High frequency characteristics (Impedance 50Ω)

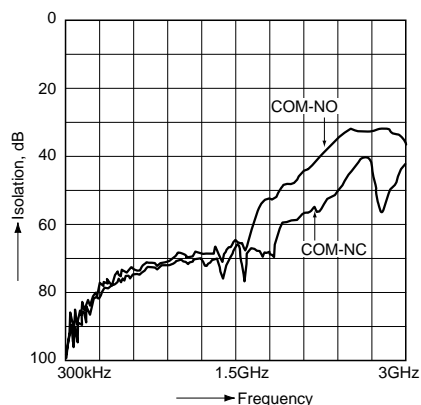
Sample: RK1-5V

Measuring method: Measured with HP network analyzer (HP8753C)

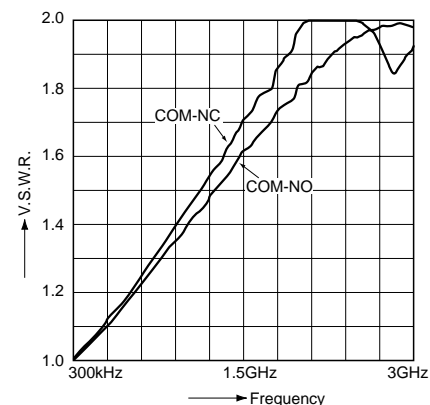
• Insertion loss characteristics



• Isolation characteristics



• V.S.W.R. characteristics



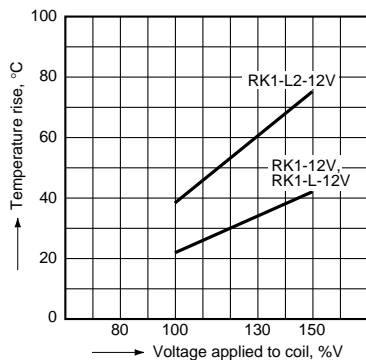
2. Coil temperature rise

Sample: RK1-12V, RK1-L-12V, RK1-L2-12V

No. of samples: n = 6

Carrying current: 10 mA

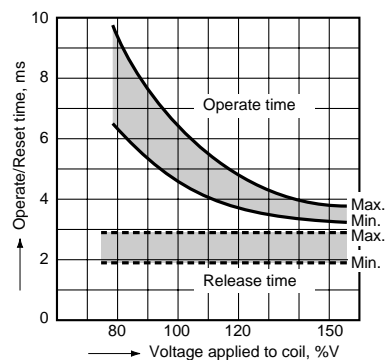
Ambient temperature: 25°C 77°F



3.-(1) Operate/Release time

(Single side stable)

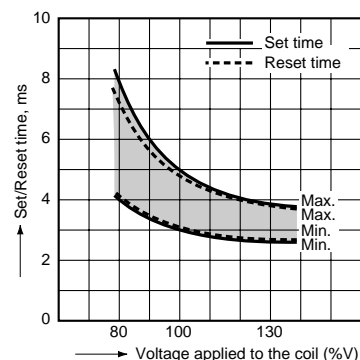
Sample: RK1-12V; No. of samples: n = 6



3.-(2) Set/Reset time (Latching)

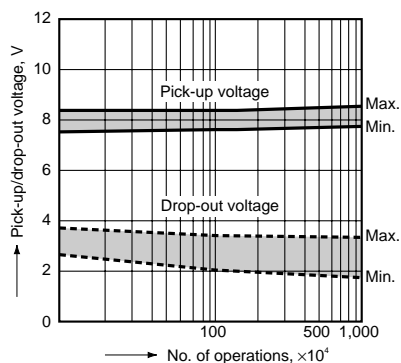
Sample: RK1-L-12V, RK1-L2-12V

No. of samples: n = 12



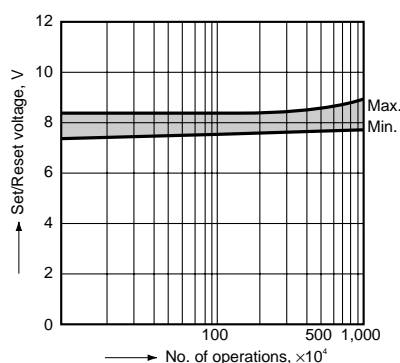
4.-(1) Mechanical life test (Single side stable)

Sample: RK1-12V; No. of samples: n = 12



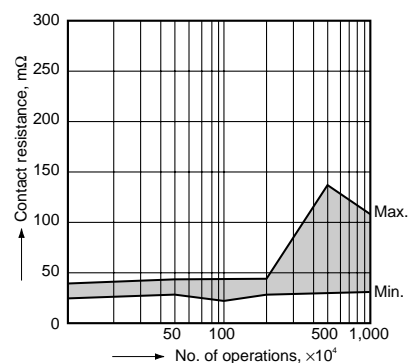
4.-(2) Mechanical life test (Latching)

Sample: RK1-L2-12V
No. of samples: n = 12



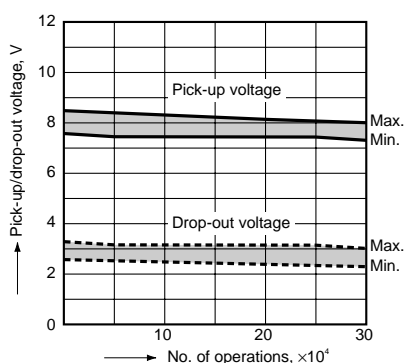
4.-(3) Mechanical life test

Sample: RK1-12V
No. of samples: n = 20 (20 × 2 contacts)



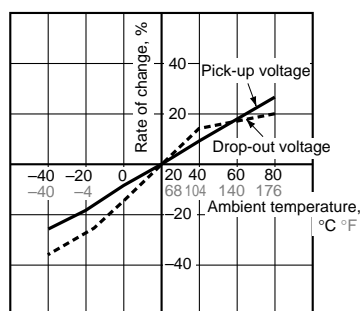
5. Electrical life test (0.01 A 24 V DC)

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



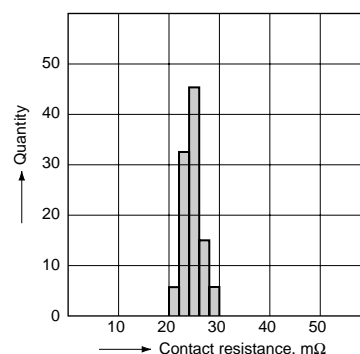
6. Ambient temperature characteristics

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



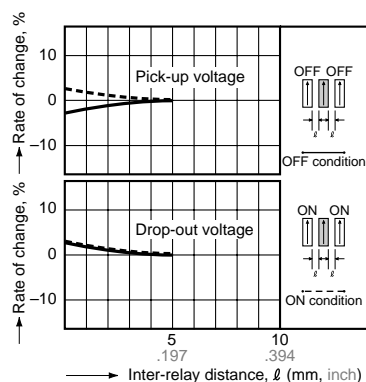
7. Contact resistance distribution (initial)

Sample: RK1-12V
No. of samples: n = 50 (50 × 2 contacts)



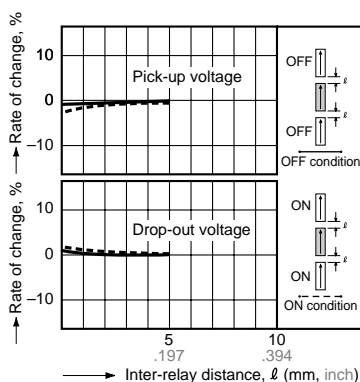
8.-(1) Influence of adjacent mounting

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).