

mm inch

⚠ Product to be discontinued.

FEATURES

1. Excellent high frequency characteristics

Impedance 50Ω (Initial)	V.S.W.R. (Max.)	1.5 (at 900 MHz)
	Insertion loss (dB. Max.)	0.3 (at 900 MHz)
	Isolation (dB. Min.)	60 (at 1.5 GHz)
Impedance 75Ω (Initial)	V.S.W.R. (Max.)	1.2 (at 900 MHz)
	Insertion loss (dB. Max.)	0.2 (at 900 MHz)
	Isolation (dB. Min.)	60 (at 1.5 GHz)

2. 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)

3. Sealed construction for automatic cleaning

4. Reversed contact types and latching types are also available

TYPICAL APPLICATIONS

• Audio visual equipment

Broadcast satellite tuners VCRs, CATVs, TVs

• Communication equipment

Automobile telephones, maritime telephones, emergency and disaster prevention communications, PCM switches

• Instrumentation

Testing equipment, measuring equipment

SPECIFICATIONS

Contact

Arrangement		1 Form C
Contact material	Stationary	Gold plating
	Movable	Gold clad
Initial contact resistance, max. (By voltage drop 10V DC 10mA)		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) (Initial)	V.S.W.R.	Max. 1.5 (at 900 MHz)
	Insertion loss	Max. 0.3 dB (at 900 MHz)
	Isolation	Min. 60 dB (at 1.5 GHz)
High frequency characteristics (Impedance 75Ω) (Initial)	V.S.W.R.	Max. 1.2 (at 900 MHz)
	Insertion loss	Max. 0.2 dB (at 900 MHz)
	Isolation	Min. 60 dB (at 1.5 GHz)
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)		Max. 10 ms (Approx. 6 ms) [Max. 10 ms [Approx. 5ms]]
Release time (without diode) [Reset time]*3 (at nominal voltage)*2		Max. 6 ms (Approx. 3 ms) [Max. 10 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*7 (Not freezing and condensing at low temperature)	Ambient temp.	−40°C to 70°C −40°F to 158°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

*7 Refer to 5. Conditions for operation, transport and storage conditions in NOTES (Page 6).

ORDERING INFORMATION

Ex. RK

1

L2

24V

Contact arrangement	Operating function	Coil voltage, DC
1: Standard contact type 1R: Reversed contact 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: No part number distinguishment on impedance in RK relays.

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

TYPES AND COIL DATA (at 20°C 68°F)

• Single side stable type

• 50 pcs. in an inner package (carton); 500 pcs. in an outer package

Part No.		Nominal coil voltage, V DC	Pick-up voltage, V DC (max.) (initial)	Drop-out voltage, V DC (min.) (initial)	Coil resistance, Ω ($\pm 10\%$)	Nominal operating current, mA ($\pm 10\%$)	Nominal operating power, mW	Maximum allowable voltage, V DC (at 60°C 140°F)
Standard type	Reversed type							
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	40.7	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

• 50 pcs. in an inner package (carton); 500 pcs. in an outer package

Part No.		Nominal coil voltage, V DC	Set voltage, V DC (max.) (initial)	Reset voltage, V DC (max.) (initial)	Coil resistance, Ω ($\pm 10\%$)	Nominal operating current, mA ($\pm 10\%$)	Nominal operating power, mW	Maximum allowable voltage, V DC (at 60°C 140°F)
Standard type	Reversed type							
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

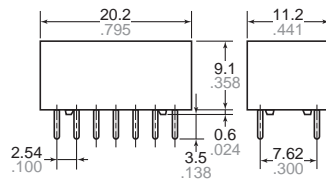
• 50 pcs. in an inner package (carton); 500 pcs. in an outer package

Part No.		Nominal coil voltage, V DC	Set voltage, V DC (max.) (initial)	Reset voltage, V DC (max.) (initial)	Coil resistance, Ω ($\pm 10\%$)	Nominal operating current, mA ($\pm 10\%$)	Nominal operating power, mW	Maximum allowable voltage, V DC (at 60°C 140°F)
Standard type	Reversed type							
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

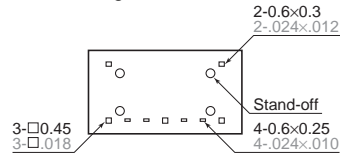
DIMENSIONS mm inch

Download [CAD Data](#) from our Web site.

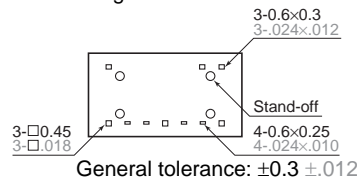
CAD Data



Single side stable and
1 coil latching

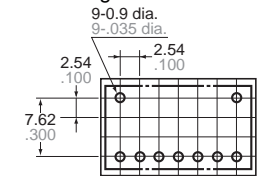


2 coil latching

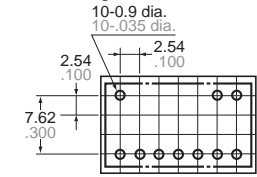


PC board pattern (Bottom view)

Single side stable and
1 coil latching



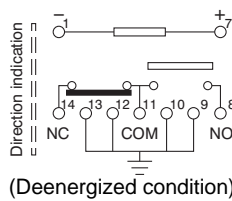
2 coil latching



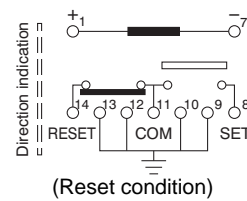
Tolerance: $\pm 0.1 \pm .003$

Schematic (Bottom view)

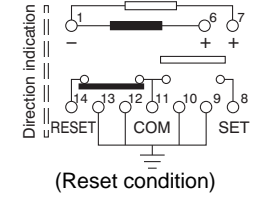
Single side stable



1 coil latching



2 coil latching



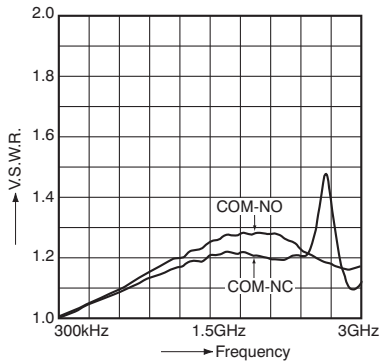
REFERENCE DATA

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

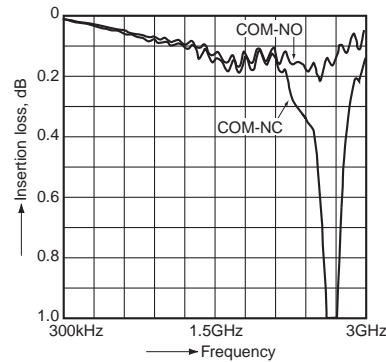
Sample: RK1-12V

Measuring method: Measured with HP network analyzer (HP8753C)

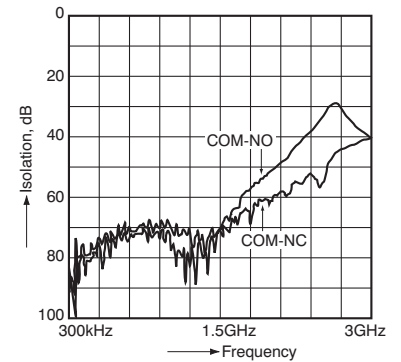
• V.S.W.R. characteristics



• Insertion loss characteristics



• Isolation characteristics

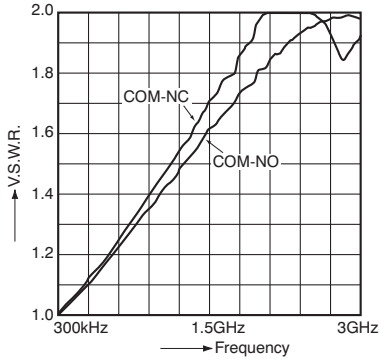


1.-(2) High frequency characteristics (Impedance 50Ω)

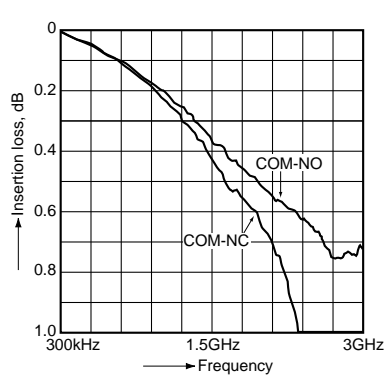
Sample: RK1-5V

Measuring method: Measured with HP network analyzer (HP8753C)

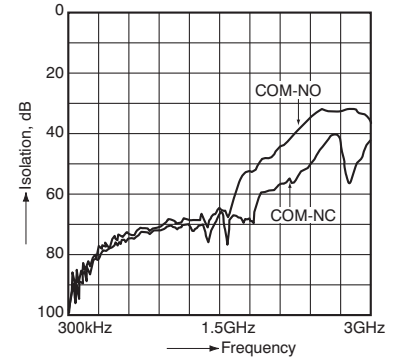
• V.S.W.R. characteristics



• Insertion loss characteristics



• Isolation characteristics



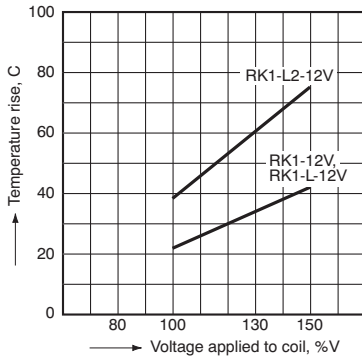
2. Coil temperature rise

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

No. of samples: n = 6

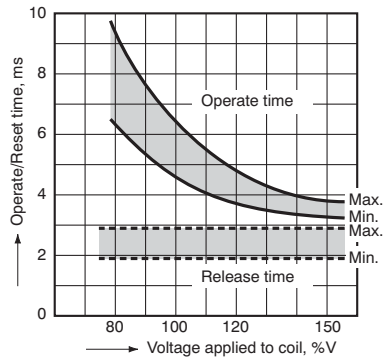
Carrying current: 10 mA

Ambient temperature: 25°C 77°F



3.-(1) Operate/Release time
(Single side stable)

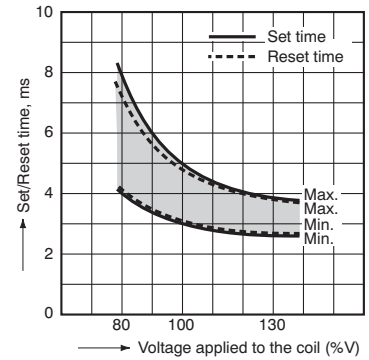
Sample: RK1-12V; No. of samples: n = 6



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

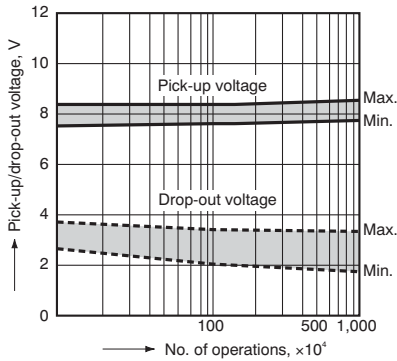
Sample: RK1-L-12V, RK1-L2-12V

No. of samples: n = 12



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

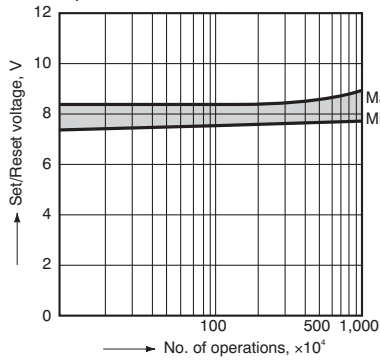
Sample: RK1-12V; No. of samples: n = 12



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

Sample: RK1-L2-12V

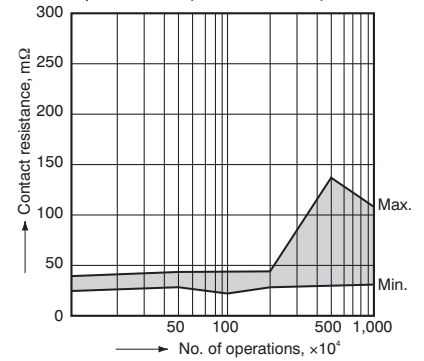
No. of samples: n = 12



4.-(3) Mechanical life test

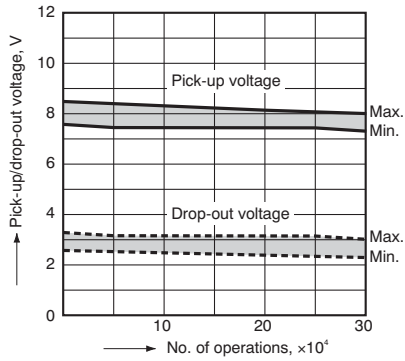
Sample: RK1-12V

No. of samples: n = 20 (20 \times 2 contacts)



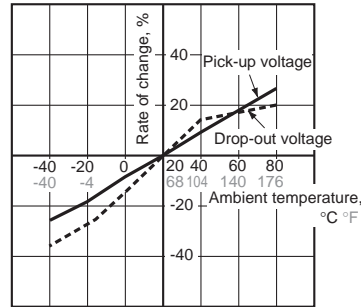
5. Electrical life test (0.01 A 24 V DC)

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



6. Ambient temperature characteristics

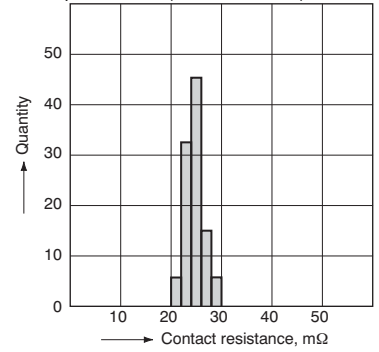
Sample: RK1-12V; No. of samples: n = 6



7. Contact resistance distribution (initial)

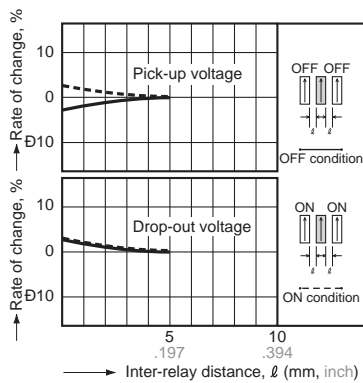
Sample: RK1-12V

No. of samples: n = 50 (50 × 2 contacts)



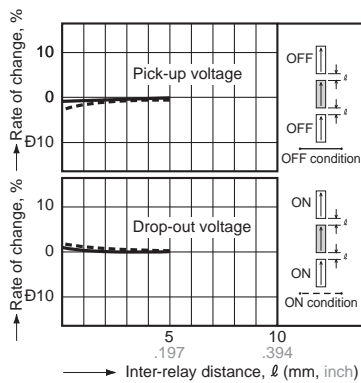
8.-(1) Influence of adjacent mounting

Sample: RK1-12V; No. of sample: n = 10



8.-(2) Influence of adjacent mounting

Sample: RK1-12V; No. of samples: n = 10



NOTES

1. Coil operating power

Pure DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%. However, check it with the actual circuit since the characteristics may be slightly different. The nominal operating voltage should be applied to the coil for more than 20 ms to set/reset the latching type relay.

2. Coil connection

When connecting coils, refer to the wiring diagram to prevent mis-operation or malfunction.

3. External magnetic field

Since RK relays are highly sensitive polarized relays, their characteristics will be affected by a strong external magnetic field. Avoid using the relay under that condition.

4. Soldering and cleaning

1) Perform manual soldering under the conditions below.

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

Preheat according to the following conditions.

Temperature	120°C 248°F or less
Time	Within 2 minute

Soldering should be done at 260±5°C 500±9°F within 6 s.

2) For automatic cleaning, the boiling method is recommended. Avoid ultrasonic cleaning which subjects the relays to high frequency vibrations, which may cause the contacts to stick. It is recommended that alcoholic solvents be used.

5. Conditions for operation, transport and storage conditions

1) Ambient temperature, humidity, and atmospheric pressure during usage, transport, and storage of the relay:

(1) Temperature:

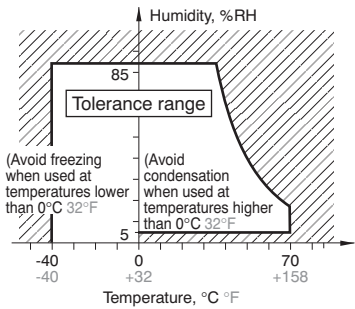
–40 to +70°C –40 to +158°F

(2) Humidity: 5 to 85% RH

(Avoid freezing and condensation.)

The humidity range varies with the temperature. Use within the range indicated in the graph below.

(3) Atmospheric pressure: 86 to 106 kPa
Temperature and humidity range for usage, transport, and storage:



2) Condensation

Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.

3) Freezing

Condensation or other moisture may freeze on the relay when the temperature is lower than 0°C 32°F. This causes problems such as sticking of movable parts or operational time lags.

4) Low temperature, low humidity environments

The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

6. 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](#).