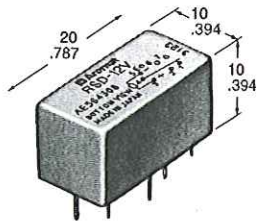


NAIS

HALF SIZE Amber RELAY

R-RELAYS



mm inch

UL File No.: E57521 CSA File No.: LR26550

- Amber sealed construction for automatic wave soldering and cleaning
- Latching types available
- High sensitivity — TTL direct drive possible
- High speed — Up to 500 cycle/sec. operations
- Wide switching range and high welding resistance
- Gold cobalt (AuCo) contact permits
 - Wider switching range from low level up to high current: 10 μ A to 1 A
 - Higher sticking resistance to inrush current
 - Stable contact resistance from initial stage throughout life

5 SPECIFICATIONS

Contact

Arrangement	1 Form C		
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	60 m Ω		
Initial contact pressure	Approx. 5 g .18 oz		
Contact material	Gold cobalt		
Electrostatic capacitance	Contact-Contact	Sealed type	3 pF
		Magnetically sealed type	4 pF
	N.O. contact-coil	Sealed type	4 pF
		Magnetically sealed type	5 pF
	N.C. contact-coil	Sealed type	5 pF
		Magnetically sealed type	6 pF
Rating (resistive)	Nominal switching capacity		1A 20 VDC, 0.3A 110 VAC
	Max. switching power		33 VA, 20 W
	Max. switching voltage		110 V AC, 30 V DC
	Max. switching current		AC 0.3 A, DC 1 A
	Min. switching power		Approx. 100 mV 10 μ A

UL/CSA rating			0.3 A 125 V AC, 1 A 30 V DC
Expected life (min. operations)	Mechanical (at 500 cps.)		10 ⁹
	Electrical (resistive)	1 A 20 V DC/0.3 A 110 V AC	10 ⁶ (at 1 cps.)
		0.5 A 30 V DC/0.1 A 110 V AC	3 \times 10 ⁶ (at 2 cps.)
		0.25 A 30 V DC/0.25 A 30 V AC	5 \times 10 ⁶ (at 5 cps.)
		0.2 A 24 V DC/0.2 A 24 V AC	10 ⁷ (at 25 cps.)
		0.1 A 12 V DC/0.1 A 12 V AC	5 \times 10 ⁷ (at 50 cps.)
	0.1 A 9 V DC/0.1 A 9 V AC	10 ⁸ (at 100 cps.)	

Remarks

- ^{*1} Measurement at same location as "Initial breakdown voltage" section
^{*2} Min. 500M Ω at 100 VDC between coils of 2 coil latching type
^{*3} Detection current: 10mA, Except for between coils of 2 coil latching type
^{*4} Excluding contact bounce time
^{*5} Half-wave pulse of sine wave: 6ms; detection time: 10 μ s
^{*6} Half-wave pulse of sine wave: 6ms
^{*7} Detection time: 10 μ s
^{*8} Although R relays are rated at 10 G/55 cps. vibration resistance, they will withstand up to 60 G/2,000 cps., provided they receive additional support such as anchoring to the PC board with epoxy resin.
^{*9} Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 45)

Coil (polarized) (at 25°C 77°F)

Minimum operating power	Single side stable	72 to 133 mW
	1 coil latching	41 to 45 mW
	2 coil latching	72 to 107 mW
Nominal operating power	Single side stable	147 to 300 mW
	1 coil latching	74 to 153 mW
	2 coil latching	147 to 331 mW

Characteristics (at 25°C 77°F)

Max. operating speed		500 cps. (mechanical)
Initial insulation resistance ^{*1}		Min. 1000 M Ω at 500 V DC ^{*2}
Initial breakdown voltage ^{*3}	Between live parts and ground	1,000 Vrms
	Between open contact	350 Vrms (500 V DC)
	Between contact and coil	1,000 Vrms
Operate time ^{*4} (at nominal voltage)		Max. 3 ms (Approx. 1 ms)
Release time (without diode) ^{*4} (at nominal voltage)		Max. 2 ms (Approx. 0.5 ms)
Contact bounce time	Single side stable	Approx. 0.5 ms
	1-coil /2-coil latching	Approx. 0.3 ms
Temperature rise		Max. 35°C at 0.5 W operating power Max. 65°C at 1 W operating power
Shock resistance	Functional ^{*5}	Min. 980 m/s ² {100 G}
	Destructive ^{*6}	Min. 980 m/s ² {100 G}
Vibration resistance	Functional ^{*7}	98 m/s ² {10 G}, 10 to 55 Hz at double amplitude of 1.6 mm ^{*8}
	Destructive	117.6 m/s ² {12 G}, 10 to 55 Hz at double amplitude of 2 mm
Conditions for operation, transport and storage ^{*9} (Not freezing and condensing at low temperature)		Ambient temp. -55°C to +65°C ^{*10} -67°F to +149°F
		Humidity 5 to 85% R.H.
Unit weight		Approx. 7 g .25 oz

^{*10} Total temperature (ambient temperature plus temperature rise in coil) should not exceed 90°C 194°F for single side stable, and 105°C 221°F for latching relays. See Reference Data for determination of coil voltage versus temperature.

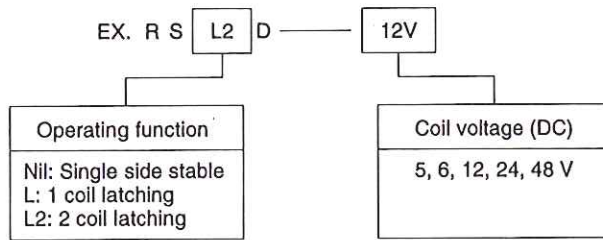
TYPICAL APPLICATIONS

Telecommunications equipment, alarm devices, machine tools, NC machines, automatic warehouse control, conveyors, air-conditioners, pressing machines, tex-

tile machinery, elevators, control panels, pin-board programmers, parking meters, industrial robots, detectors, annunciators, optical instruments, business

machines, time recorders, cash registers, copiers, vending machines, medical equipment.

ORDERING INFORMATION



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

TYPES AND COIL DATA at 25°C 77°F

Single side stable (RSD)

Nominal coil voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Maximum allowable voltage, V DC (40°C)	Coil resistance, Ω ($\pm 10\%$)	Nominal operating power, mW	Inductance, Henrys
5	3.5	0.5	13	170	147	0.050
6	4.7	0.6	14	220	164	0.075
12	9.3	1.2	28	890	162	0.3
24	16	2.4	42	2,000	288	0.66
42	28	4.2	85	8,000	221	2.7

5

1 coil latching (RSLD)

Nominal coil voltage, V DC	Pick-up voltage, V DC (max.)	Maximum allowable voltage, V DC (40°C)	Coil resistance, Ω ($\pm 10\%$)	Nominal operating power, mW	Inductance, Henrys
5	3.5	18	340	74	0.12
6	4.3	20	450	80	0.16
12	8.0	30	1,500	96	0.66
24	17	75	6,000	96	2.4
42	23	110	12,000	147	3.9

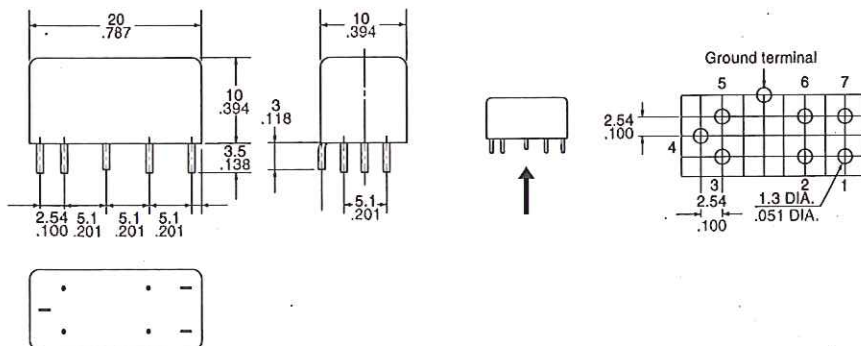
2 coil latching (RSL2D)

Nominal coil voltage, V DC	Pick-up voltage, V DC (max.)	Maximum allowable voltage, V DC (40°C)	Coil resistance, Ω ($\pm 10\%$)		Nominal operating power, mW	Inductance, Henrys
			Set coil	Reset coil		
5	3.5	13.0	170	170	147	0.024
6	4.3	14.0	225	225	160	0.04
12	8.0	26.0	650	650	230	0.14
24	17.0	50.0	2,700	2,700	213	0.35
42	23.0	75.0	5,500	5,500	321	0.8

- (Notes) 1. Maximum allowable operating power: 1000 mW at 25°C 77°F.
2. Change rate of pick-up voltage vs. temperature is described in Data on page xx

DIMENSIONS

mm inch



Terminal dimensions (Except soldering)

Terminal No.	Thickness	Width
1, 7	0.5 .020	0.6 .024
4	0.3 .012	0.7 .028
2, 3, 5, 6, ground terminal	0.5 DIA. .020 DIA.	

Soldering: 0.3 .012 max.

General tolerance: $\pm 0.5 \pm .020$ Tolerance: $\pm 0.2 \pm .008$

SCHEMATIC

1. Single side stable (2, 6: free terminals)

Same operation as the conventional magnetic relays.
 (a) During deenergization, terminals **No. 4 (COM)** and **No. 1 (N.C.)** are on "make".



(b) During energization with the indicated polarity, terminals **No. 4** and **No. 7 (N.O.)** are on "make".

Note:
 Energization with an opposite polarity does not switch the contact. Apply proper polarity to switch the contact.

2. Latching type

Once energized, the **COM** contact is kept under the same condition without further energizing continuously.

To switch over the contact, energy with an opposite polarity should be applied to the coil.

1 coil latching (2, 6: free terminals)

(a) When terminals **No. 5 (-)** and **No. 3 (+)** are energized, terminals **No. 4** and **No. 7** are switched to "make". (or stay on "make"). when the coil current is switched off, terminals **No. 4** and **No. 7** are held on "make."

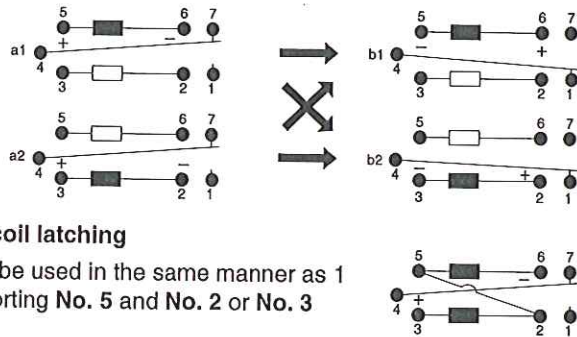


(b) When energized with reverse polarity terminals **No. 4** and **No. 1** are switched to "make" and held on "make" until energized again with an opposite polarity.

2 coil latching

(a) When terminals **No. 5 (+)** and **No. 6 (-)** or terminals **No. 3 (+)** and **No. 2 (-)** are energized terminals **No. 4** and **No. 7** are switched to "make". (or remain on "make"). When the coil current is switched off, these terminals are held on "make".

(b) When terminals **No. 5 (-)** and **No. 6 (+)** or terminals **No. 3 (-)** and **No. 2(+)** are energized in the reverse of condition (a), terminals **No. 4** and **No. 1** are switched to "make" and held on "make" until energized in an opposite polarity once again.



Special use of 2 coil latching

2 coil latching can be used in the same manner as 1 coil latching by shorting **No. 5** and **No. 2** or **No. 3** and **No. 6**

1. The latching type of R relay can be used as the memory element to be operated by a pulse supplied from one or two different sources.

2. With the 2 coil latching type, when simultaneously applying one polarity to one coil and the opposite polarity to the other, the previously energized coil will take priority of operation and will maintain the contact condition.

3. In practical use, switching either from a1 to b2 or from a2 to b1 is recommendable.

DIFFERENCES BETWEEN R RELAYS AND REED RELAYS

	R relays	Reed relays
Structure		
Contact arrangement	1 Form C	1 Form A or 1 Form B
Contact capacity	20 W (high contact pressure)	5 to 15 W
Operating function	Single side stable Latching	Single side stable
"Getter" hole	Yes	No

"Getter" holes are formed on both pole shoes to obtain uniform contact resistance throughout life. Film-forming phenomena on contacts is thus fully prevented.

