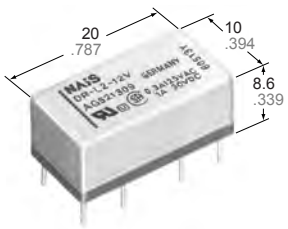
Discontinued

NAiS HIGHLY RELIABLE MINIATURE DIP RELAYS DR-RELAYS

UL File No.: E43149 CSA File No.: LR26550



mm inch

- **High breakdown voltage — Between open contacts: 750 Vrms**
  Between contacts and coil: 1500 Vrms
- **Surge voltage withstand: 1500 V (Based on part 68, FCC standard)**
- **1 coil and 2 coil latching types available**
- **High sensitivity**
- **High contact pressure**
- **Miniature size and low profile — standing only 8.6 mm (.339 inches) including stand-offs on headers**
- **High speed — Operate time: Approx. 1 ms**

SPECIFICATIONS

Contacts

Arrangement			1 Form C
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)			60 mΩ
Initial contact pressure			Approx. 9 g .32 oz
Contact material			Gold cobalt
Electrostatic capacitance	Contact-Contact		Approx. 3 pF
	N.O. contact-Coil		Approx. 4 pF
	N.C. contact-Coil		Approx. 5 pF
Rating (resistive)	Nominal switching capacity		1 A 20 VDC, 0.3 A 110 VAC
	Max. switching power		20 W, 33 VA
	Max. switching voltage		110 V AC, 30 V DC
	Max. switching current		AC 0.3 A, DC 1 A
Expected life (min. operations)	Mechanical (at 50 cps.)		10^9
	Electrical	1 A 20 V DC resistive	10^6
		0.3 A 110 V AC resistive	10^6
		0.2 A 24 V DC resistive	10^7

Coil

Nominal operating power	Single side stable	78 to 160 mW
	1 coil latching	59 to 99 mW
	2 coil latching	111 to 150 mW

Characteristics

Max. operating speed		60 cpm at nominal load 300 cps. at no load
Initial insulation resistance*1		Min. 1,000 MΩ at 500 V DC
Initial breakdown voltage*2	Between open contacts	750 Vrms
	Between live parts and ground	1,000 Vrms
	Between coil and contact	1,500 Vrms
Operate time*3 (at nominal voltage)		Max. 3 ms (Approx. 1 ms)
Release time(without diode)*3 (at nominal voltage)		(Approx. 0.5 ms)
Contact bounce	Single side stable	Approx. 0.5 ms
	1 coil latching	Approx. 0.3 ms
	2 coil latching	Approx. 0.3 ms
Temperature rise (at 20°C)		Max. 20°C (at 120 mW application) Max. 47°C (at 500 mW application)
Shock resistance	Functional*4	Min. 980 m/s² {100 G}
	Destructive*5	Min. 980 m/s² {100 G}
Vibration resistance	Functional*6	196 m/s² {20 G}, 10 to 55 Hz at double amplitude of 3.3 mm
	Destructive	196 m/s² {20 G}, 10 to 55 Hz at double amplitude of 3.3 mm
Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature)	Ambient temp.	–50°C to +85°C –58°F to +185°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 4 g .14 oz

Remarks

*1 Measurement at same location as "Initial breakdown voltage" section
*2 Detection current: 10 mA (excluding 2 coil latching type)
*3 Excluding contact bounce time
*4 Half-wave pulse of sine wave: 6ms; 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

TYPICAL APPLICATIONS

Telecommunications equipment, alarm devices, machine tools, NC machines, automatic warehouse control, conveyors, air-conditioners, pressing machines, textile machinery, elevators, control panels, pin-board programmers, parking meters, industrial robots, detectors, annunciators, optical instruments, business machine, time recorders, cash registers, copiers, vending machines, medical equipment.

ORDERING INFORMATION

Ex. DR — L2 — 24V

Operating function	Coil voltage
Nil: Single side stanble L: 1 coil latching L2: 2 coil latching	3, 5, 6, 12, 24, 48 V

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

Discontinued

TYPES AND COIL DATA at 20°C 68°F

Single side stable	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Maximum allowable voltage, V DC	Coil resistance, Ω (± 10%)	Nominal Operating power, mW
DR-3V	2.4	0.3	6.8	94	96
DR-5V	4.0	0.3	10.9	320	78
DR-6V	4.8	0.6	12.8	330	109
DR-12V	9.6	1.2	26.4	1,400	103
DR-24V	17.0	2.4	42.4	3,600	160
DR-48V	33.6	4.8	74.1	11,000	209

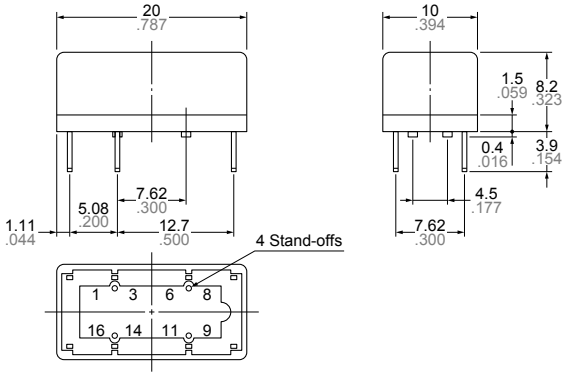
1 coil latching	Pick-up voltage, V DC (max.)	Maximum allowable voltage, V DC	Coil resistance, Ω (± 10%)	Nominal Operating power, mW
DR-L-3V	2.4	8.9	160	56
DR-L-5V	4.0	14.5	420	59
DR-L-6V	4.8	17.4	610	59
DR-L-12V	9.6	33.9	2,300	63
DR-L-24V	17.0	53.8	5,800	99
DR-L-48V	33.6	102.7	21,100	110

2 coil latching	Pick-up voltage, V DC (max.)	Maximum allowable voltage, V DC	Coil resistance, Ω (± 10%) Set coil & Reset coil	Nominal Operating power, mW
DR-L2-3V	2.4	6.3	80	112
DR-L2-5V	4.0	10.6	225	111
DR-L2-6V	4.8	12.0	290	124
DR-L2-12V	9.6	24.6	1,210	119
DR-L2-24V	18.0	43.6	3,840	150
DR-L2-48V	33.6	63.0	7,950	290

DIMENSIONS

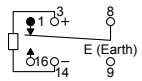
mm inch

Single side stable
1 coil latching



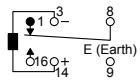
Schematic (Bottom view)

Single side stable



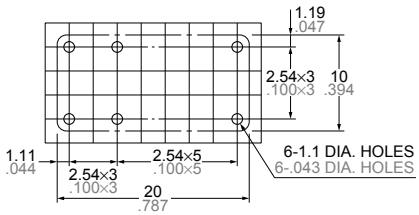
(Deenergized condition)

1 coil latching



(Reset condition)

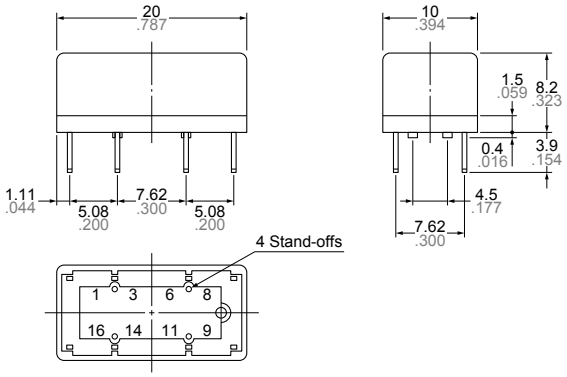
PC board pattern (Bottom view)



General tolerance: ±0.3 ±.012

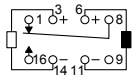
Tolerance: ±0.1 ±.004

2 coil latching



Schematic (Bottom view)

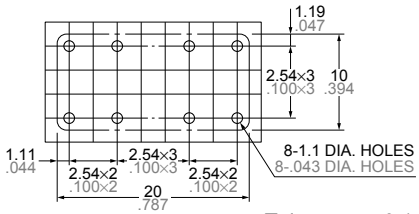
2 coil latching



(Reset condition)

Note: With the 2-coil latching type, use with one of the following combinations: No. 3 (+) and No. 14 (–) as the set coil, and No. 6 (+) and No. 1 (–) as the reset coil, or No. 6 (–) and No. 11 (+) as the set coil, and No. 3 (–) and No. 14 (+) as the reset coil.

PC board pattern (Bottom view)



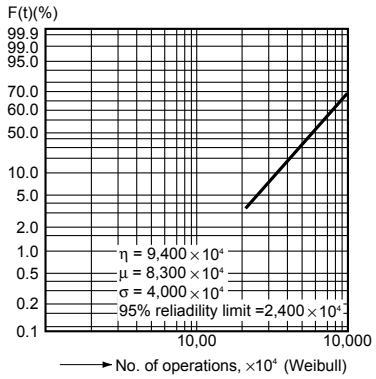
General tolerance: ±0.3 ±.012

Tolerance: ±0.1 ±.004

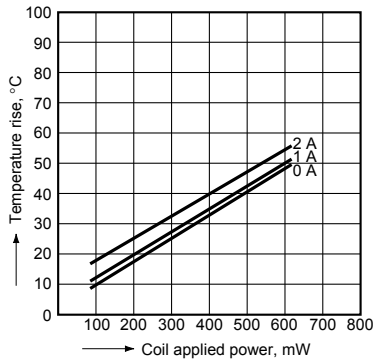
REFERENCE DATA

1. Contact reliability test

Sample: DR-12V, 10 pcs.
Load: 10 μA 100 mV DC, 50 cps
Detection level: 100 Ω

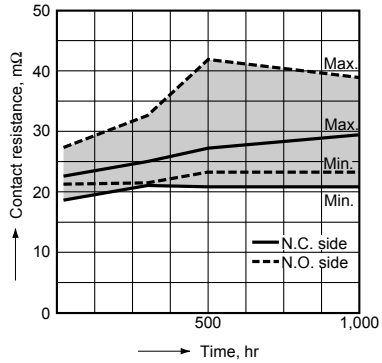


2. Coil temperature rise



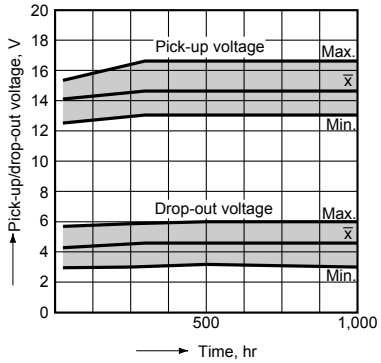
3.-(1) Leaving at high temperature (Change of contact resistance)

Tested Sample: DR-24V, 10pcs
Ambient temperature: 85°C 185°F
Coil applied voltage: 24V DC (Nominal voltage)
Contact carrying current: No current



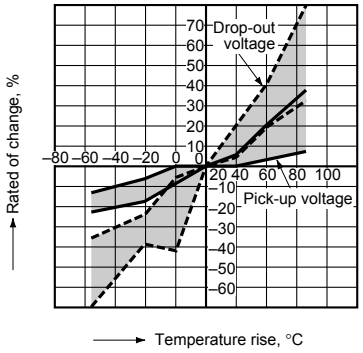
3.-(2) Leaving at high temperature (Change of pick-up and drop-out voltages)

Tested Sample: DR-24V, 10pcs
Ambient temperature: 85°C 185°F
Coil applied voltage: 24V DC (Nominal voltage)
Contact carrying current: No current



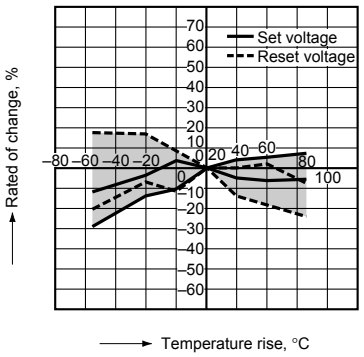
4.-(1) Pick-up/drop-out voltage vs. temperature (Single side stable)

Sample: DR-5V, 5 pcs.



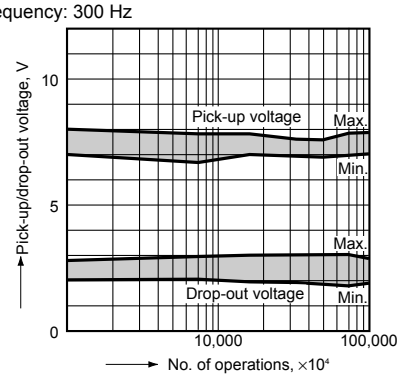
4.-(2) Pick-up/drop-out voltage vs. temperature (1-coil latching)

Sample: DR-L-5V, 5 pcs.



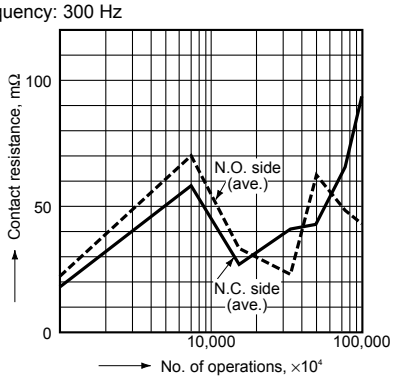
5.-(1) Mechanical life

Change of pick-up and drop-out voltage
Sample: DR-12V, 5 pcs.
Frequency: 300 Hz



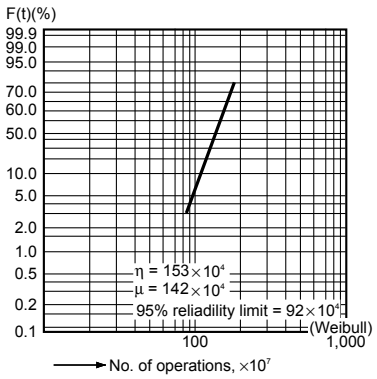
5.-(2) Mechanical life

Change of contact resistance
Sample: DR-12V, 5 pcs.
Frequency: 300 Hz



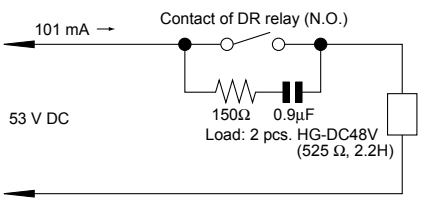
6.-(1) Electrical life

Sample: DR-12V, 10 pcs.
Load: 1 A 20 V DC resistive

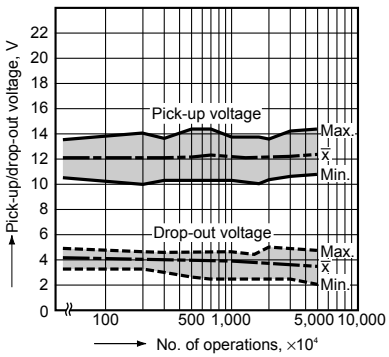


6.-(2) Electrical life test

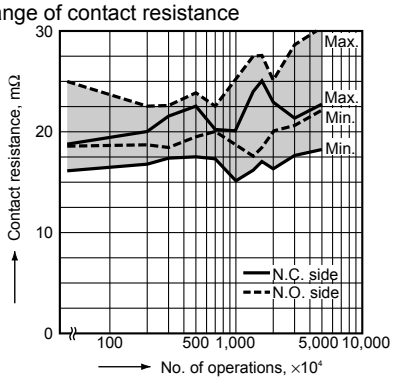
Sample 10 pcs. DR-12V
Load: 101 mA 53 V DC relay coil
2 pcs. HG4-DC48V coils in parallel



Change of pick-up and drop-out voltage



Change of contact resistance



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