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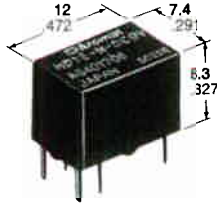
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# NAIS

ULTRA-MINIATURE SINGLE POLE RELAY

# HD-RELAYS

3



mm inch

UL File No.: E57521

CSA File No.: LR26550

- Ideal for portable devices! Only 1.7 g.
- Dimensions:  
8.3 mm height × 12 mm length × 7.4 mm width  
.327 inch height × .472 inch length × .291 inch width
- High sensitivity: 280 mW nominal operating power
- Gold-clad bifurcated contact for high reliability
- Sealed construction

## SPECIFICATIONS

Contact			
Arrangement	1 Form C		
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	100 mΩ		
Contact material	Gold-clad silver		
Rating (resistive)	Max. switching power	30 W, 50 VA	
	Max. switching voltage	60 V DC, 125 V AC	
	Max. switching current	1 A DC, AC	
	Max. carrying current	2 A DC, AC	
UL/CSA rating	1 A 30 V DC		
Expected life (min. operations)	Mechanical (at 180 cpm)	5×10 <sup>6</sup>	
	Electrical (at 20 cpm)	1 A 30 V DC	10 <sup>5</sup>
		0.5 A 100 V AC	10 <sup>5</sup>
Coil (at 25°C 77°F)			
Minimum operating power	179 to 192 mW		
Nominal operating power	280 to 330 mW		

## Characteristics (at 25°C 77°F, 50% Relative humidity)

Max. operating speed	20 cpm (at nominal voltage)	
Initial insulation resistance* <sup>1</sup>	Min. 100 MΩ at 500 V DC	
Initial break-down voltage* <sup>2</sup>	Between open contacts	500 Vrms
	Between contact and coil	500 Vrms
Operate time (without diode)* <sup>3</sup> (at nominal voltage)	Max. 10 ms (Approx. 3 ms)	
Release time (without diode)* <sup>3</sup> (at nominal voltage)	Max. 5 ms (Approx. 3 ms)	
Temperature rise (at nominal voltage)	Max. 50°C with nominal coil voltage and at maximum switching current	
Shock resistance	Functional* <sup>4</sup>	Min. 98 m/s <sup>2</sup> {10 G}
	Destructive* <sup>5</sup>	Min. 980 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional* <sup>6</sup>	58.8 m/s <sup>2</sup> {6 G}, 10 to 55 Hz at double amplitude of 1 mm
	Destructive	117.6 m/s <sup>2</sup> {12 G}, 10 to 55 Hz at double amplitude of 2 mm
Conditions for operation, transport and storage* <sup>7</sup> (Not freezing and condensing at low temperature)	Ambient temp.	-25°C to +60°C -13°F to +140°F
	Humidity	5 to 85% R.H.
Unit weight	1.7 g .06 oz	

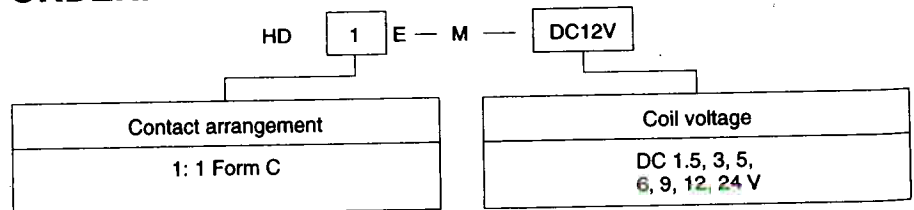
### Remarks

- \*<sup>1</sup> Measurement at same location as "Initial breakdown voltage" section
- \*<sup>2</sup> Detection current: 10mA
- \*<sup>3</sup> Excluding contact bounce time
- \*<sup>4</sup> Half-wave pulse of sine wave: 11ms; detection time: 10μs
- \*<sup>5</sup> Half-wave pulse of sine wave: 6ms
- \*<sup>6</sup> Detection time: 10μs
- \*<sup>7</sup> Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 45)

## TYPICAL APPLICATION

1. Low voltage signal change-over in portable VCR, camera, audio, and other small household devices.
2. Use in lap top computers and other small computer and peripheral devices (printers, plotters, etc.).

## ORDERING INFORMATION



Note: Standard packing; Carton: 100 pcs. Case: 500 pcs.

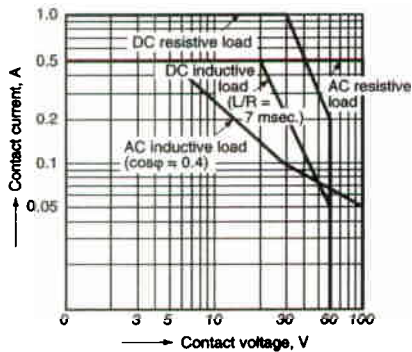
**TYPES AND COIL DATA** (at 20°C 68°F)

Part No.	Nominal voltage V DC	Pick-up voltage, VDC (max.)	Drop-out voltage, V DC (min.)	Coil resistance $\Omega$ ( $\pm 10\%$ )	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, V DC (at 60°C 140°C)
HD1E-M-DC1.5V	1.5	1.2	0.15	8	187.5	280	1.65
HD1E-M-DC3V	3	2.4	0.3	32	93.7	280	3.3
HD1E-M-DC5V	5	4.0	0.5	89	56.1	280	5.5
HD1E-M-DC6V	6	4.8	0.6	128	46.8	280	6.6
HD1E-M-DC9V	9	7.2	0.9	270	33.3	280	9.9
HD1E-M-DC12V	12	9.6	1.2	515	23.5	280	13.2
HD1E-M-DC24V	24	19.2	2.4	2,060	11.6	280	26.4

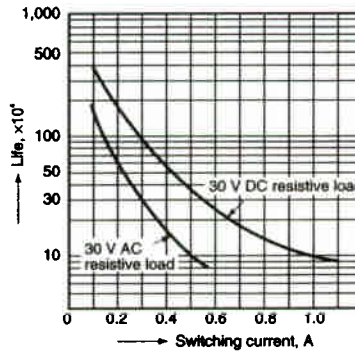
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**REFERENCE DATA**

1. Maximum switching power

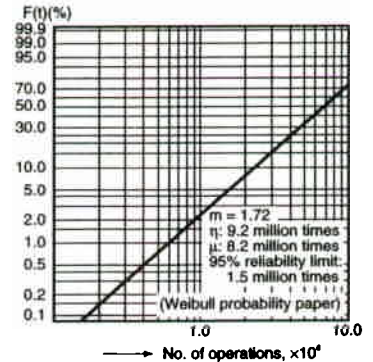


2. Life curve

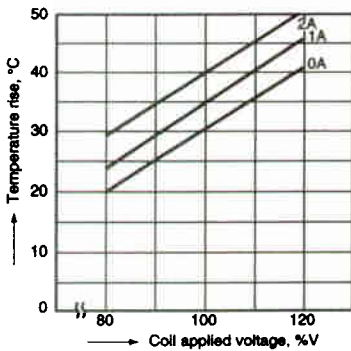


3. Contact reliability test

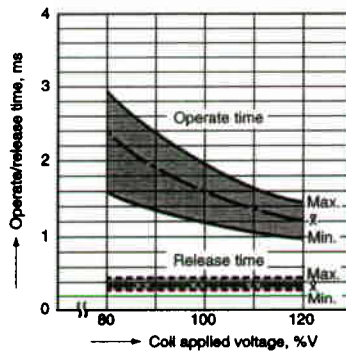
Condition: 1 V, 1 mA, 1 kHz AC  
 Detection level (5  $\Omega$ )  
 Sample: HD1E-M-9VDC, 10 pcs.



4. Coil temperature rise

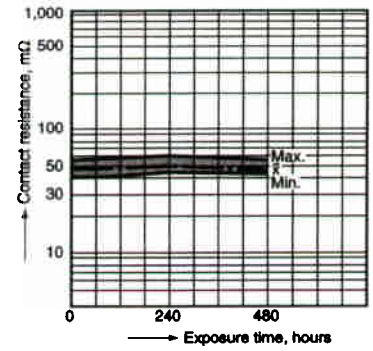


5. Operate/release time

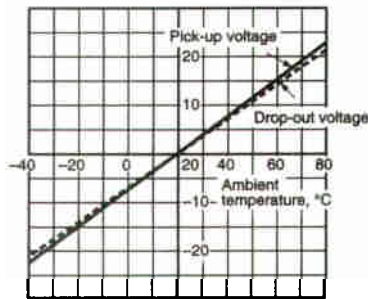


6. H<sub>2</sub>S gas test

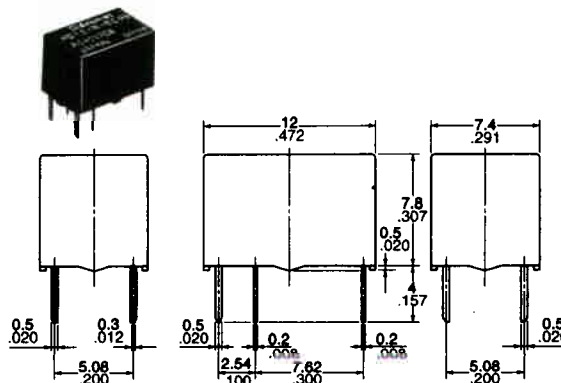
Gas density: 2 to 5 ppm  
 Ambient temperature 35 to 37°C 95 to 99°F  
 Humidity: 35 to 85% RH



7. Ambient temperature characteristics

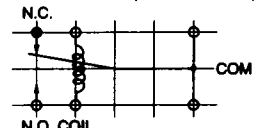


**DIMENSIONS**

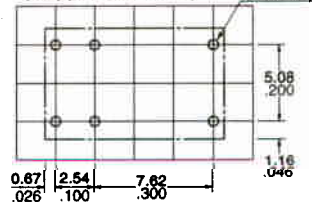


mm inch

Schematic (Bottom view)



PC board pattern (Copper-side view)



General tolerance:  $\pm 0.3 \pm 0.12$

Tolerance:  $\pm 0.1 \pm 0.04$

For Cautions for Use, see Relay Technical Information (Page 32 to 60).