HR12-V MINIATURE HIGH INSULATION REED RELAY



c UL us

File No.: E133481

Features

- Width is only 6.2mm，Ultra narrow width for compact installation
- Dielectric strength between open contacts⩾3000VDC
  Optional ⩾4000VDC specification
- Dielectric strength between coil & contacts⩾5000VDC
- High insulation with 600V reinforced insulation level
- High switching voltage at 1500VDC/1000VAC
- Combined injection molding structure for high vibration resistance
- Built in magnetic shield & freewheeling diode optional

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance	150mΩ max.(10mA 30mVDC)
Contact material	Rhodium alloy
Contact rating(Res. load)	10mA 900VDC 10mA 1500VDC 1A 30VDC
Max. switching voltage	1500VDC/1000VAC
Max. switching current	1.5A
Maximum making current	2.5A
Max. switching power	100W
Min. applicable load[2)]	10mV 10μA
Mechanical endurance	1×10^8OPS
Electrical endurance	10mA 600VDC (1×10^5OPS, 105℃,1s on/9s off) 10mA 900VDC (1×10^5OPS, 105℃,1s on/9s off) 10mA 1000VDC (5×10^4OPS, 105℃,1s on/9s off) 10mA 1500VDC (5×10^4OPS, 105℃, 1s on/9s off) 10mA 1000VAC (5×10^4OPS, 105℃, 1s on/9s off)

Notes: 1) The data shown above are initial values.
2) Min. applicable load is reference value. Please perform the confirmation test with the actual load before production since reference value may change according to switching frequencies, environmental conditions and expected contact resistance and reliability.

CHARACTERISTICS

Insulation resistance		10000MΩ(500VDC) Typ.: 10^{12}Ω(500VDC)
Dielectric strength	Between open contacts	Standard type: 3000VDC 1min High voltage[2)]: 4000VDC 1min
	Between coil & contacts	5000VDC 1min
Impulse voltage	Between open contacts	6000V(1.2/50μs)
	Between coil & contacts	6000V(1.2/50μs)
Operate time (Rated voltage, including bounce)		1.0ms max.
Release time (W/O freewheeling diode)		0.1ms max.
Vibration resistance		10Hz to 2000Hz,20g
Shock resistance	Functional	490m/s²
	Destructive	980m/s²
Ambient temperature		-40℃ to 105℃
Humidity		5% to 85%RH
Termination		SIP
Unit weight		Approx. 2.8g
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.
2) The characteristic number for the High voltage model specification is AN3.

COIL

Coil power	288mW max.
Temperature rise	35K max.(1A Load,at 105℃)

SAFETY APPROVAL RATINGS

UL/CUL	10mA 600VDC(105℃) 10mA 900VDC(105℃) 10mA 1000VDC(105℃) 10mA 1500VDC(105℃)

Notes: 1) Only typical loads are listed above. Other load specifications can be available upon request.

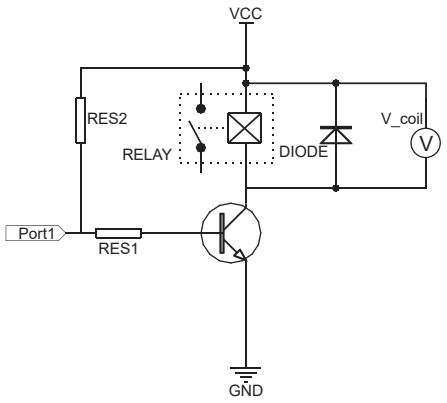
COIL DATA

23˚C

Coil Code	Nominal Coil Voltage VDC	Pick-up Voltage VDC max.[2)]	Drop-out Voltage VDC min.	Coil Resistance Ω	Nominal Power mW approx.	Max. Voltage VDC[5)]
HR12-V/3	3	2.25	0.3	50 × (1±10%)	180	4.5
HR12-V/4.5	4.5	3.38	0.45	112.5 × (1±10%)	180	6.75
HR12-V/5[3)]	5	3.75	0.5	138.8 × (1±10%)	180	7.5
HR12-V/12	12	9	1.2	500 × (1±10%)	288	18.0
HR12-V/24	24	18	2.4	2000 × (1±10%)	288	36.0

Notes: 1)The data shown above are initial values.

2)The initial Pick-up Voltage and Reset Voltage refer to the factory-set values of the relay. To supply rated step voltage to the coil is the foundation of proper relay operation. Please make sure the voltage applied across the coil reaches the rated value before use. Please refer to the typical diagram below for single-stable relay. "V_coil" is the rated voltage of the coil:



3)To compensate for the voltage drop of the transistor, a 4.5V specification relay is recommended when the supply voltage for the transistor is 5V.

4)The “DIODE” device in the above figure stands for coil freewheeling diode, if the selected relay specification has a built-in freewheeling diode, then there is no need to set up an additional freewheeling diode in the relay driving circuit.

5) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

6) When user's requirements can't be found in the above table, special order allowed.

7) During the relay pick-up or drop-out processes, there are stages of contact pressure change, contact vibration and unstable contact etc. When the voltage applied to coil is gradually changed, it will lengthen the unstable stage and affect relay endurance. To reduce this influence, please apply step voltage(switching circuit) to relay coil.

ORDERING INFORMATION

	HR12-V/	12	-H	M	D	（XXX）
Type						
Coil voltage	3, 4. 5, 5, 12, 24					
Contact arrangement	**H:** 1 Form A					
Magnetic shielding	**M:** With magnetic shield **Nil:** Without magnetic shield					
Packing style	**D:** With freewheeling diode **Nil:** Without freewheeling diode					
Special code	**XXX:** Customer special requirement **Nil:** Standard **AN3:** High voltage (Dielectric strength between open contacts≥4000VDC 1min) **B40:** Extended pin type (4±0.3mm)					

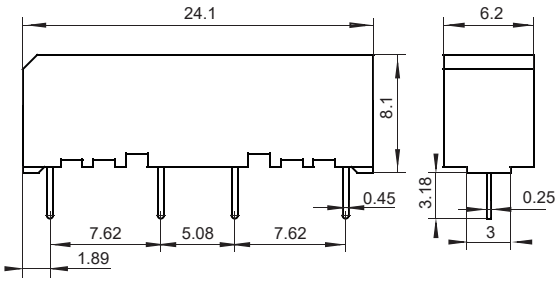
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

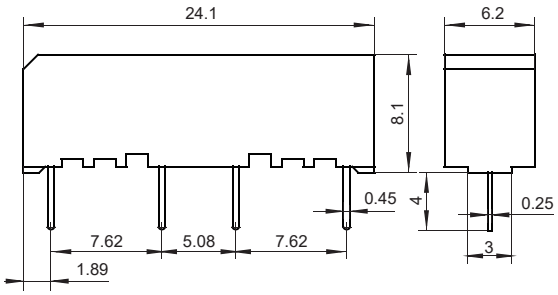
Unit: mm

Outline Dimensions

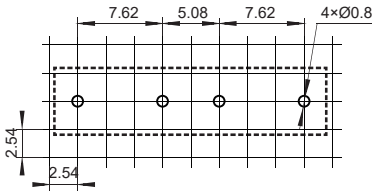
Standard pin type



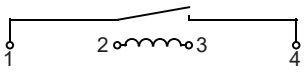
Extended pin type(B40 type)



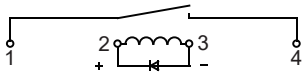
PCB Layout(Top view)



Wiring Diagram(Top view)

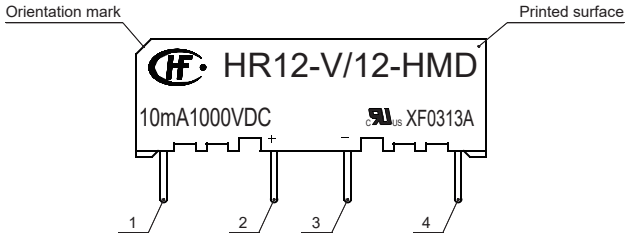


Without freewheeling diode



With freewheeling diode

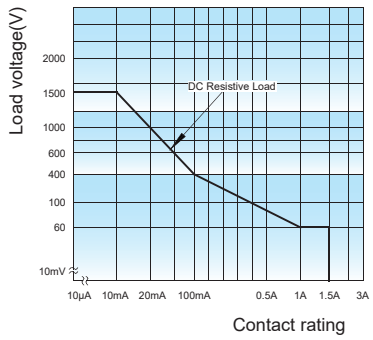
Pin Layout



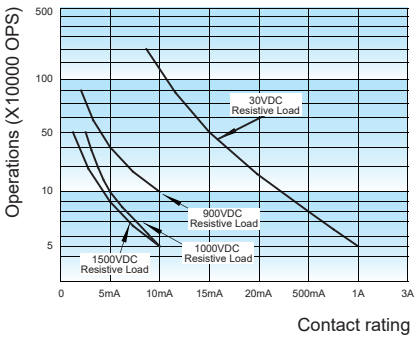
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension ＞1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension ＞5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.

CHARACTERISTIC CURVES

MAX.SWITCHING POWER



ENDURANCE CURVE



Test conditions: Resistive load, 1s on 9s off.

Notice

1) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.
2) The relay pick-up and drop-out voltages are the initial values tested under standard conditions (23℃). Applying rated voltage to the relay coil is the basis for normal operation of the relay. Considering the influence of environment temperature, coil temperature rise (such as hot start), voltage fluctuation, etc., please make sure that the voltage applied to the relay coil reaches the rated voltage before use in order to ensure the safety margin, after the relay is reliably operated, to be kept under pressure is not recommended.
3) During the relay pick-up or drop-out processes, there are stages of contact pressure change, contact vibration and unstable contact etc. When the voltage applied to coil is gradually changed, it will lengthen the unstable stage and affect relay endurance. To reduce this influence, please apply step voltage(switching circuit) to relay coil.
4) The relay may be damaged when falling or shocking conditions exceed the requirements.
5) Please use wave soldering or manual soldering for THT relay. If you need reflow welding, please confirm the feasibility with us.
6) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
7) Regarding the plastic sealed relay, we should leave it cooling naturally untill below 40℃ after welding, then clean it and deal with Coating. Remarkably the temperature of solvents should also be controlled below 40℃. Please avoid cleaning the relay by ultrasonic,or using the solvents like gasoline, Freon, and so on, which would affect the configuration of relay or influence the environment.
8) When applied with continuous current, the heat from relay coil will age its isolation. Thus, please do not ground connected the coil to reduce electrical erosion if possible. And please provide protection circuit to avoid broken wire and losses.
9) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidelines of relay".

Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications subject to change without notice. We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

© Xiamen Hongfa Electroacoustic Co., Ltd. All rights of Hongfa are reserved.