HFD39 SUBMINITURE HIGH INSULATION SIGNAL RELAY



File No.：E133481

File No.：R 50588457

Features

- Dielectric strength:
  ⩾3000VAC/4300VDC 1min(between open contacts)
  ⩾4500VAC/7000VDC 1min(between coil & contacts)
- Bifurcated contacts
- High contact switching capability:
  30mA 1000VDC/10mA 1500VDC
- THT & SMT types available
- Contact gap⩾1.5 mm, Meets IEC 62776 requirement
- High insulation,
  Meets the requirements of 600V reinforced insulation

RoHS compliant

CONTACT DATA

Contact arrangement	1A
Contact resistance[1)]	150mΩ max.(at 10mA 30mVDC)
Contact material	Ag Alloy+Au plated
Contact rating (Res. load)	1A 277VAC 1A 110VDC 5mA 2000VDC 10mA 1500VDC 30mA 1000VDC 10mA 1000VDC
Max.switching current	4A
Max.swtiching voltage	1400VAC/2000VDC
Max.switching power	277VA/110W
Min. applicable load[2)]	10mV 10μA
Mechanical endurance	1×10^7OPS
Electrical endurance	1×10^5OPS(Ag+Au plated,5mA 2000VDC, Resistive load,105℃,1s on 9s off) 1×10^5OPS(Ag+Au plated,30mA 1000VDC, Resistive load,105℃,1s on 9s off) 5×10^4OPS(Ag+Au plated,10mA 1500VDC, Resistive load,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		1000MΩ(500VDC)
Dielectric strength	Between open contacts	3000VAC/4300VDC 1min
	Between coil & contacts	4500VAC/7000VDC 1min
Surge Voltage	Between open contacts	4kV(1.2/50μs)
	Between coil & contacts	6kV(1.2/50μs)
Operate time(at rated voltage)		6ms max.
Release time(at rated voltage)		6ms max.
Ambient temperature		-40℃ to 85℃ -40℃ to 105℃[2)]
Humidity		5% to 85% RH
Shock resistance	Destructive	735m/s²
	Functional	980m/s²
Vibration resistance	Destructive	10Hz to 55Hz 3.3mm DA
	Functional	10Hz to 55Hz 5.0mm DA
Termination		THT,SMT
Unit weight		2.5g max
Moisture sensitivity levels (Only for SMT type, JEDEC-STD-020)		MSL-3
Construction		Plastic sealed

Notes: 1) The data shown above are initial values.
2) For instance: Product with 888 suffix is for application at 105℃.

COIL

Coil power	Single side stable	See “COIL DATA”
Temperature rise		70K max.(at 1A load)

SAFETY APPROVAL RATINGS

UL/CUL	Ag Alloy + Au	30mA 1000VDC 105℃ 1A 277VAC 85℃
TÜV		1A 110VDC 85℃

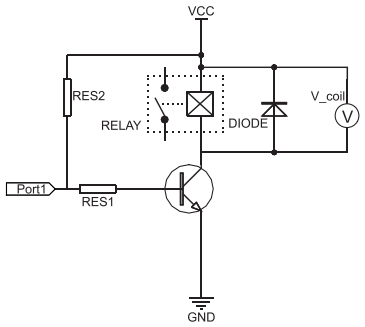
Notes: Only some typical rating are listed above.If more details are required,please contact us.

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[4)]
HFD39/1.5	1.5	1.13	0.15	11.2×(1±10%)	200	2.2
HFD39/2.4	2.4	1.8	0.24	28.8×(1±10%)	200	3.6
HFD39/3[3)]	3	2.25	0.3	45×(1±10%)	200	4.5
HFD39/4.5	4.5	3.38	0.45	101×(1±10%)	200	6.7
HFD39/5[3)]	5	3.75	0.5	125×(1±10%)	200	7.5
HFD39/6	6	4.5	0.6	180×(1±10%)	200	9
HFD39/9	9	6.75	0.9	405×(1±10%)	200	13.5
HFD39/12	12	9	1.2	720×(1±10%)	200	18
HFD39/24	24	18	2.4	2880×(1±10%)	200	36

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 coil is the foundation of relay proper operation. Please make sure the applied voltage to the coil reach at rated values. Please refer to the typical diagram right for single side stable relay. The “V-coil” is the rated voltage;
3) In case 5V of transistor drive circuit, it is recommended to use 4.5V type relay, and 3V to use 2.4V type relay.
4) Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.
5) When user's requirements can't be found in the above table, special order allowed.
6) 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

	HFD39/	12	-S	R	（XXX）

Type	
Coil voltage	1.5，2.4，3，4.5，5，6，9，12，24VDC
Terminal type	**S:** Standard SMT **S1:** Short terminal SMT **Nil:** THT[1)]
Packing style	**R:** Tape and reel packing(Only for SMT type)[2)] **Nil:** Tube packing(Only for THT type)
Special code[3)]	**XXX:** Customer special requirement **Nil:** Standard type For instance:Product with 921 suffix is for automotive use, rated for 105˚C. Product with 897 suffix is for automotive use, with high-pitch break contact terminals, see outline drawing.

Notes:1) THT relays: Use wave or manual soldering. Confirm reflow soldering feasibility with us first.
2) R type (tape and reel) packing is moisture-proof which meets requirement of MSL-3. Please choose R type packing for SMT products. For R type, the letter "R" will only be printed on packing tag but not on relay cover. Tube packing is normally not available for SMT products unless specially requested by customer. But please note that tube packing is not moisture-proof so please bake the products before use according to description of Notice 9 herewith. In addition, tube packaging will be adopted when the ordering quantity of R type is equal to or less than 100 pieces unless otherwise specified.
3) The customer special requirement express as special code after evaluating by Hongfa.Take 888 version as an example, the PN is HFD39/12-SR(888).
4) When coil sort, terminal type or packing style are needed, pleaes add "-" after coil voltage is selected. For instance,HFD39/12-SR.
5) For products that should meet the explosion-proof requirements of "IEC 60079 series",please note [Ex] after the specification while placing orders.Not all products have explosion-proof certification,so please contact us if necessary, in order to select the suitable products.
6) Please make sure that there are no silicon-based substances (such as silicon rubber, silicone oil, silicon-based coating agents, silicon fillers, etc.) around the relay, because it will generate silicon-containing volatile gas, which may cause poor contact in case of silicon-containing volatile gas sticking on contact.Flux proofed and dust cover type relays are prohibited in environments with water vapor and harmful gases (P, Cl, H_2S, SO_2, NO_2). Plastic sealed relays shall be used with practical test verification.

OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

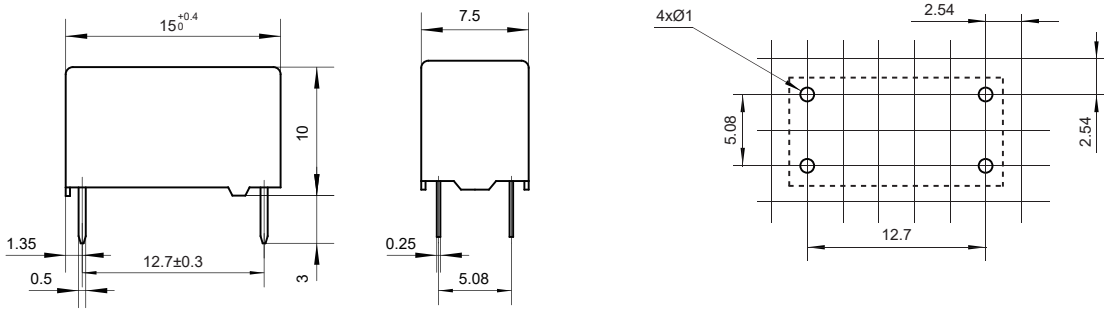
Unit: mm

Normal pin

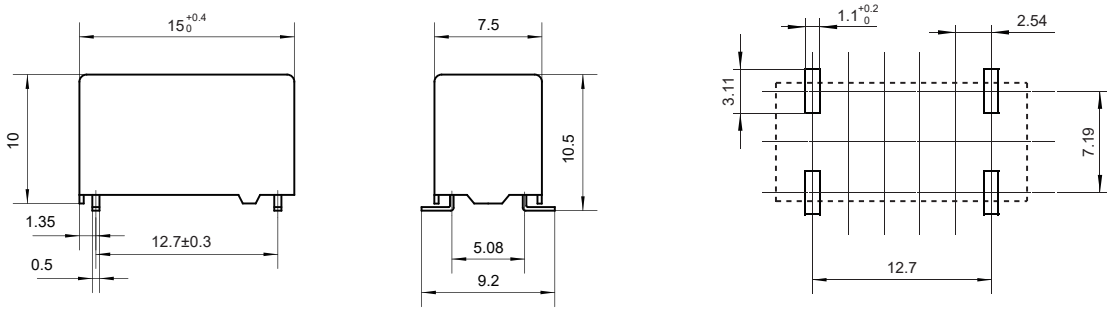
Outline Dimensions

PCB Layout
(Bottom view)

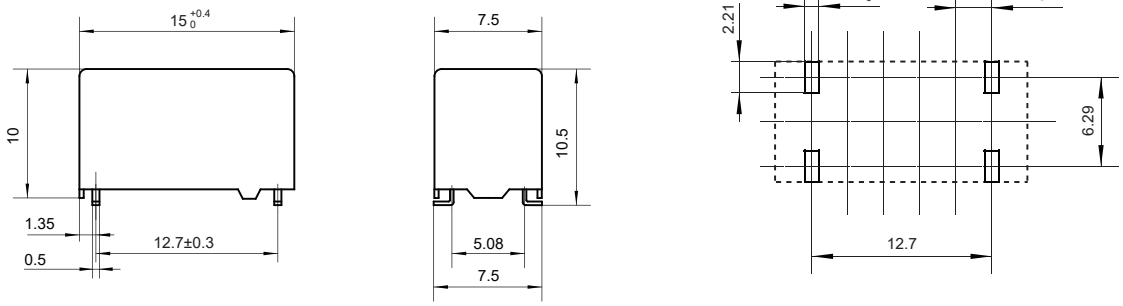
THT type



Standard(SMT type)



Short terminal(SMT type)



OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

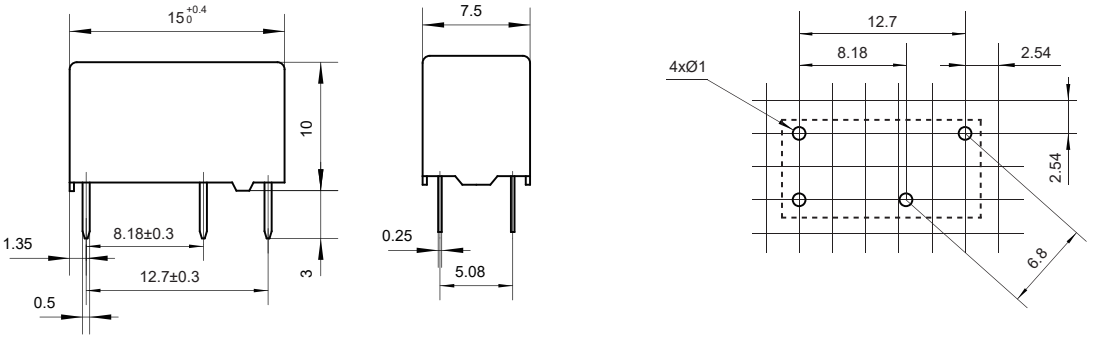
Unit: mm

(897) pin

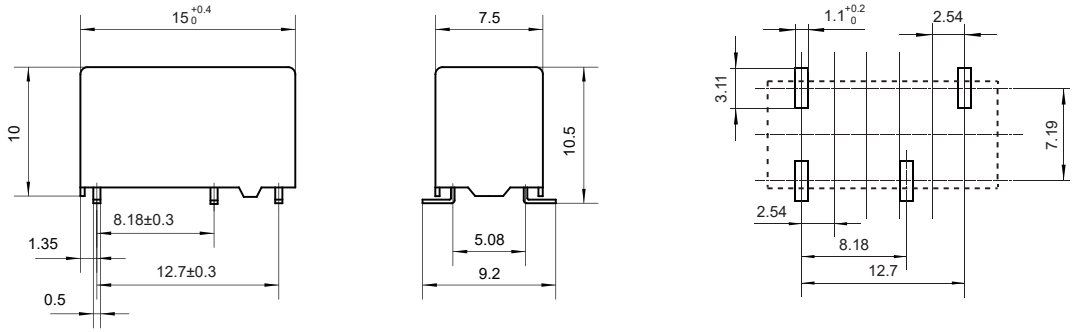
Outline Dimensions

PCB Layout
(Bottom view)

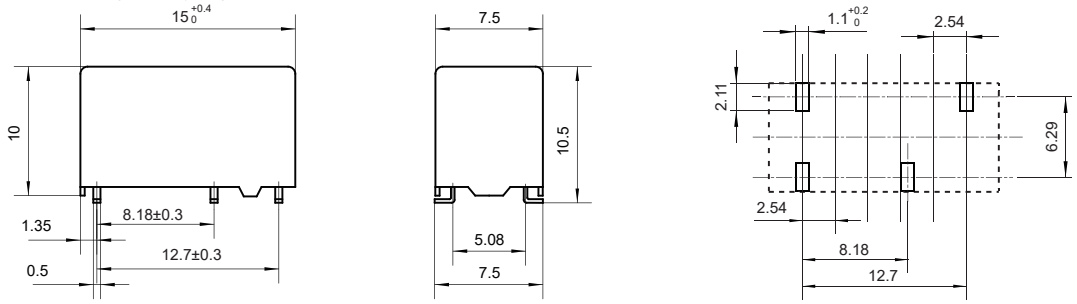
THT type



Standard(SMT type)



Short terminal(SMT type)

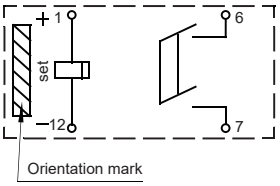


OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

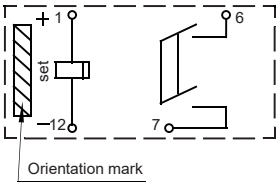
Unit: mm

Wiring Diagram
(Bottom view)

Normal pin

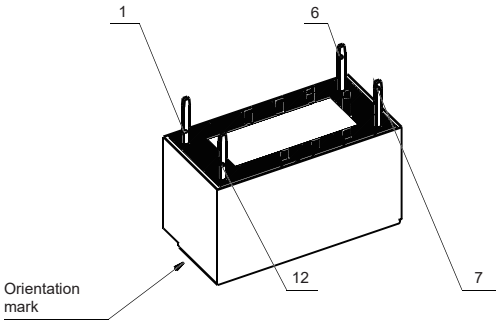


(897) pin

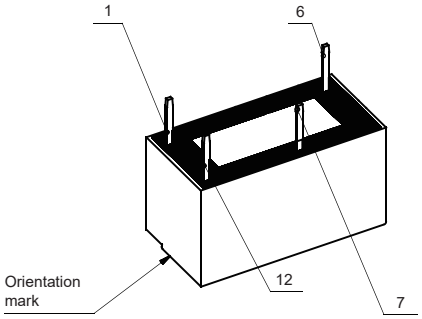


Pin Layout

Normal pin



(897) pin

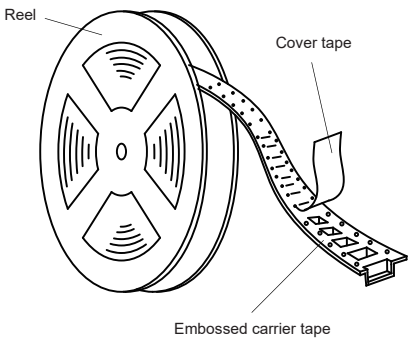


Notes: 1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.
2) 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.
3) The tolerance without indicating for PCB layout is always ±0.1mm.

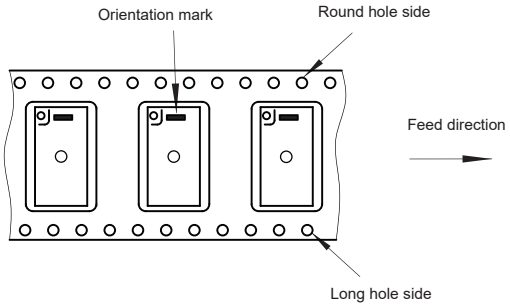
TAPE PACKING

Unit: mm

Direction of Relay Insertion



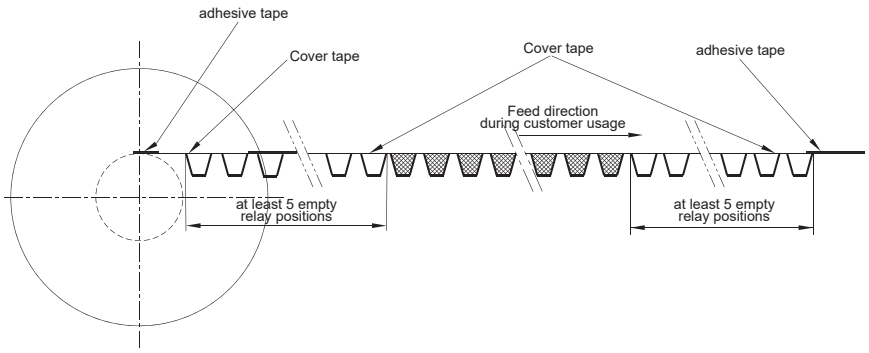
Feed direction of relay



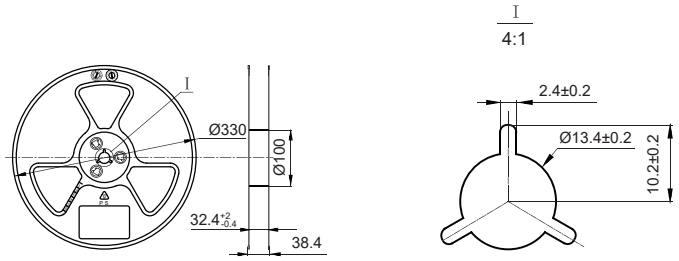
Notes: 1) Packing: 350pcs/reel, 4 reels/carton.
2) MOQ for reel packing is 700pcs.

TAPE PACKING

Unit: mm

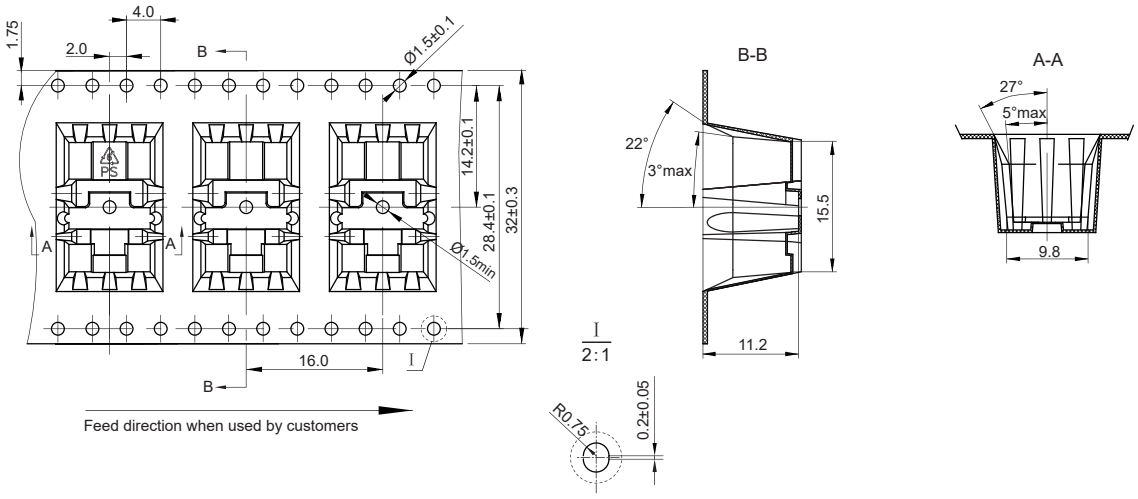


Reel Dimensions



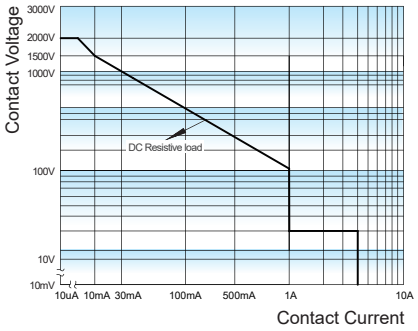
Tape Dimensions

(S1 type,S type: Standard SMT)

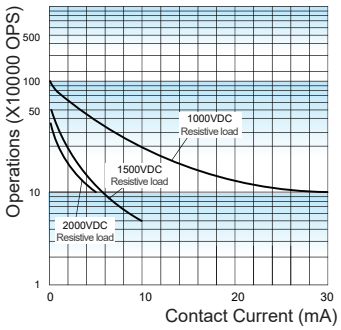


CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



ENDURANCE CURVE



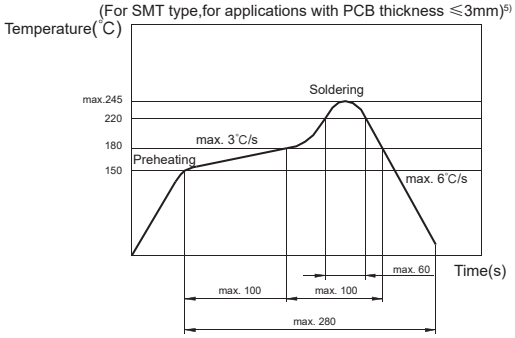
Test conditions:

1 Form A Resistive load,

1s on 9s off.

RECOMMENDED REFLOW SOLDERING PROFILE

(For SMT type,for applications with PCB thickness ≤3mm)[5)]



(Measurement point: PCB surface where the relay is mounted)

Notice

1) This relay is highly sensitive polarized relay, if correct polarity is not applied to the coil terminals, the relay does not operate properly.
2) To avoid using relays under strong magnetic field which will change the parameters of relays such as pick-up voltage and drop-out voltage.
3) Energizing coil with rated voltage is basic for normal operation of a relay,please male sure the energized voltage to relay coil have reached the rated voltage. Regarding latching relay, in order to maintain the “set” or “reset” status,impulse width of the rated voltage applied to coil should be more than 5 times of “set” or “reset” time.
4) The relay may be damaged because of falling or when shocking conditions exceed the requirement.
5) For SMT products, practical validation shall be performed and confirmed acceptable before mass production if the reflow-soldering profile deviates from our recommended profile. In principle, double reflow-soldering of relays is not recommended. If a second reflow-soldering process is required, the relay shall be cooled down to ambient temperature by natural cooling or forced-air cooling after the first reflow, and practical validation shall be completed and confirmed acceptable prior to mass production.
   For applications with PCB thickness ＞3mm, the temperature of the relay body may be significantly higher than the PCB surface temperature. Practical validation shall be performed and confirmed acceptable before use and mass production.
6) Please use wave soldering or manual soldering for straight-in relay. If you need reflow welding, please confirm the feasibility with us.
7) Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
8) 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, avoid using the solvents like gasoline, Freon, and so on, which would affect the configuration of relay or influence the environment.
9) Relays packaged in moisture barrier bags meet MSL-3 requirements. The relays should be stored at ambient conditions of ≤30℃ and ≤60% RH after they are removed from their packaging, and should be used within 168 hours. If the relays cannot be used within 168 hours, please repack them or store them in a drying oven at 25℃±5℃, ≤10% RH. Otherwise, relays may be subjected to a soldering test to check their performance, or they may be used after keeping them in an oven for 72 hours at with 50℃±5℃, ≤30% RH.
10) 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 errosion if possible. And please provide protection circuit to avoid broken wire and losses.
11) Please make sure that there are no silicon-based substances (such as silicon rubber, silicone oil, silicon-based coating agents, silicon fillers, etc.) around the relay, because it will generate silicon-containing volatile gas, which may cause poor contact in case of silicon-containing volatile gas sticking on contact.Flux proofed and dust cover type relays are prohibited in environments with water vapor and harmful gases (P, Cl, H_2S, SO_2, NO_2). Plastic sealed relays shall be used with practical test verification.
12) About preferable condition of operation, storage and transportation, please refer to "Explanation to terminology and guidetines of relay.
13) 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 coi is gradualy changed, it wil lengthen the unstable stage and affect relay endurance. To reduce this infuence please apply step voltage(switching circuit) to relay coil.

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.