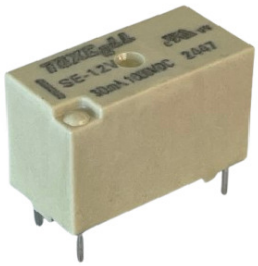
Subminiature High Insulation Signal Relay	SE

Features

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



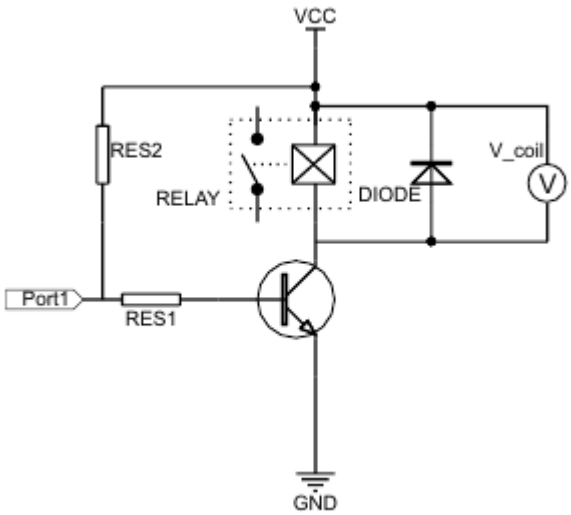
c UL us
(File No.:E122258)

1. COIL DATA (at 23°C)

Nominal Voltage (VDC)	Pick-up Voltage (VDC)	Drop-out Voltage (VDC)	Max Allowable Voltage (VDC)	Coil Current (mA)(±10%)	Coil Resistance (Ω)(1±10%)	Coil Power (mW)
1.5	1.13	0.15	2.2	133.3	11.2	Approx. 200
2.4	1.80	0.24	3.6	83.3	28.8	
3	2.25	0.30	4.5	66.7	45	
4.5	3.38	0.45	6.7	44.4	101	
5	3.75	0.5	7.5	40	125	
6	4.50	0.6	9	33.3	180	
9	6.75	0.9	13.5	22.2	405	
12	9	0.12	18	16.7	720	
24	18	0.24	36	8.3	2880	

Notes:

1) The data shown above are initial values.
2) 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) The maximum allowable 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 length the unstable stage and affect relay endurance.
   To reduce this influence, please apply step voltage(switching circuit) to relay coil.



2. CONTACT DATA

Contact Arrangement		1 Form A
Contact Resistance		150mΩ max. (at 10mA 30mVDC)
Contact Material		Ag alloy + Au plated
Contact Ratings (Resistive load)		1A 277VAC 1A 110VDC 5mA 2000VDC 10mA 1500VDC 30mA 1000VDC 10mA 1000VDC
Max. Switching Voltage		1400VAC / 2000VDC
Max. Switching Current		4A
Max. Switching Power		277VA / 110W
Min. applicable load[2)]		10mV 10μA
Life Expectancy	Electrical	100,000 operations (5mA 2000VDC, 30mA 1000VDC) 50,000 operations (10mA 1500VDC)
	Mechanical	10,000,000 operations

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.

3. CHARACTERISTICS

Insulation Resistance		1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts	3000VAC/4300VDC 1mm
	Coil and Contacts	4500VAC/7000VDC 1min
Surge voltage	Open Contacts	4kV(1.2/50μs)
	Coil and Contacts	6kV(1.2/50μs)
Operate Time (at rated voltage)		6ms max.
Release Time (at rated voltage)		6ms max.
Temperature Rise		70K max. (at 1A load)
Temperature Range		-40℃ ~ 85℃ -40℃ ~ 105℃ 2)
Vibration Resistance	Functional	10 ~ 55Hz 5.0mm DA
	Destructive	10 ~ 55Hz 3.3mm DA
Shock Resistance	Functional	980m/s^2
	Destructive	735m/s^2
Humidity		5 ~ 85% RH
Termination		PCB (DIP, SMT)
Weight		Approx. 2.5g
Moisture sensitivity levels (Only for SMT type, JEDEC-STD-020)		MSL-3
Outline Dimension (L x W x H)		15.0 x 7.5 x 10.0mm

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

2) Available application at 105℃ upon request.

4. ORDERING INFORMATION

SE - 12V S R ① ② ③ ④	
① Relay Model	SE
② Coil Voltage	1.5V=1.5VDC, 2.4V=2.4VDC, 3V=3VDC, 4.5V=4.5VDC, 5V=5VDC, 6V=6VDC, 9V=9VDC, 12V=12VDC, 24=24VDC
③ Termination	Nil: DIP S: Standard SMT S1: Short terminal SMT
④ Packing	Nil: Tube packing (Only for DIP type) R: Tape & reel packing (only for SMT type)

Note: 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 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 packing will be adopted when the ordering quantity of R type is equal to or less than 100 pieces unless otherwise specified.

5. SAFETY APPROVAL

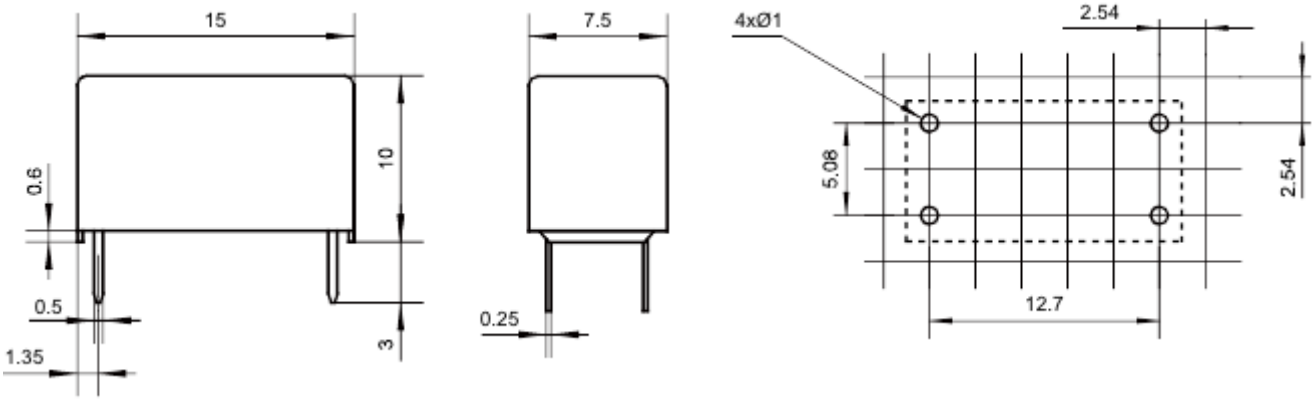
UL / cUL	30mA 1000VDC 105℃ 1A 277VAC 85℃ 1A 110VDC 85℃

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

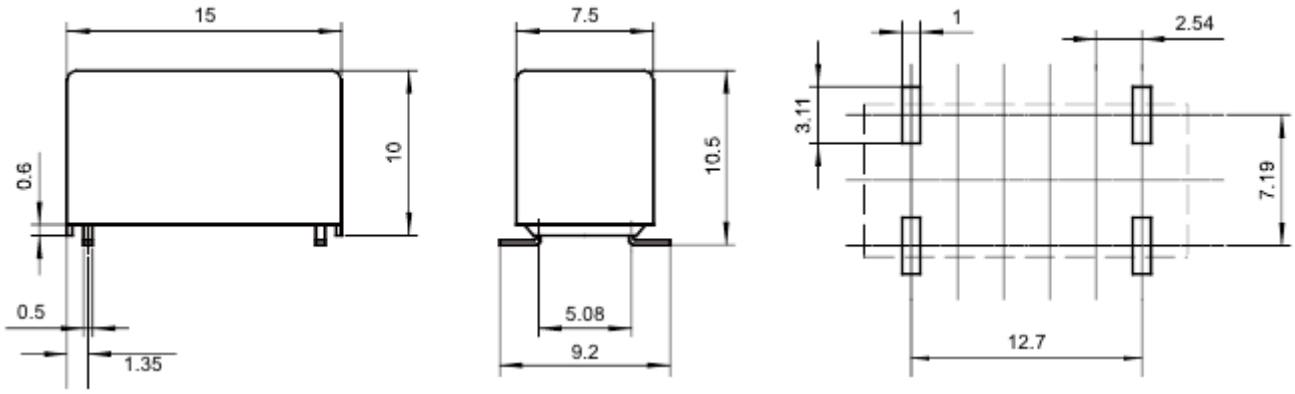
6. DIMENSIONS (Unit: mm)

Outline Dimensions PCB Layout (Bottom view)

DIP type

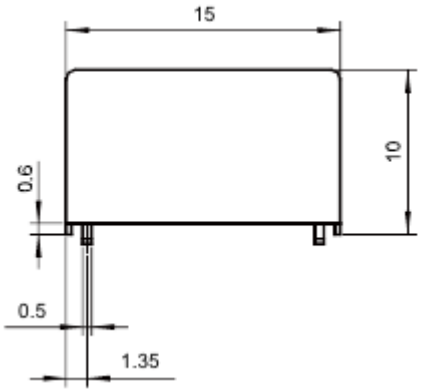


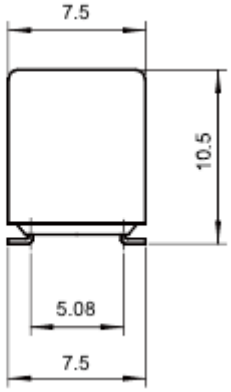
Standard SMT type



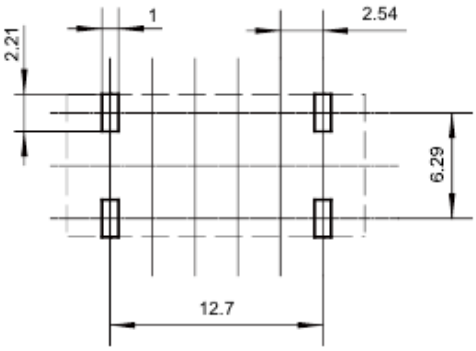
Short terminal
SMT type

Outline Dimensions

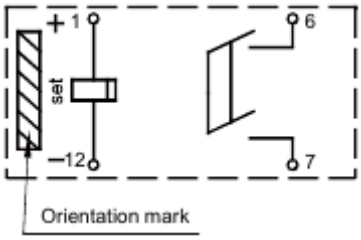




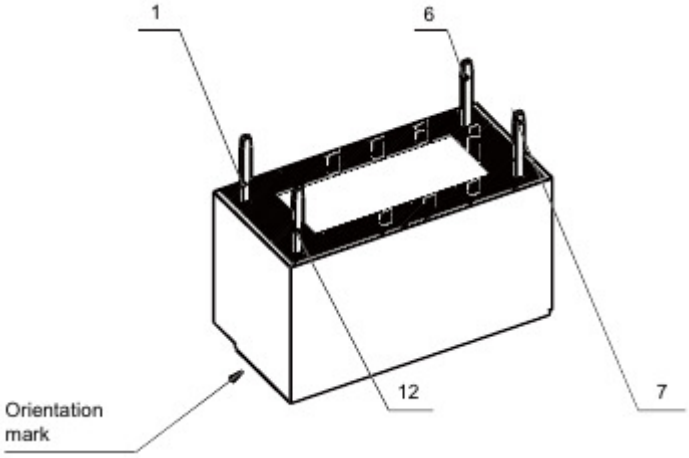
PCB Layout (Bottom view)



Wiring Diagram (Bottom View)



Pin Layout



Remark:

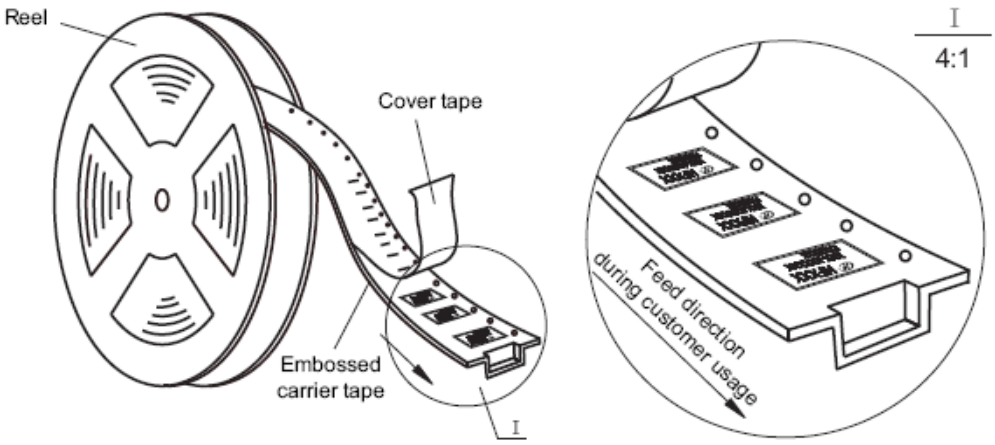
1) The pin dimension of the product outline drawing is the size before tinning (it will become larger after tinning), and the mounting hole size is the recommended design size of the PCB board hole. The specific PCB board hole design size can be mapped and adjusted according to the actual product.

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.

7. TAPE PACKING (Unit: mm)

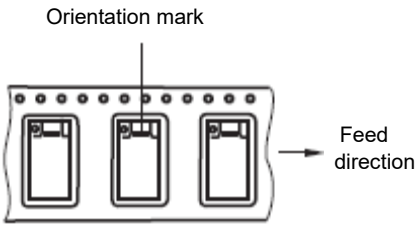
Direction of Relay Insertion

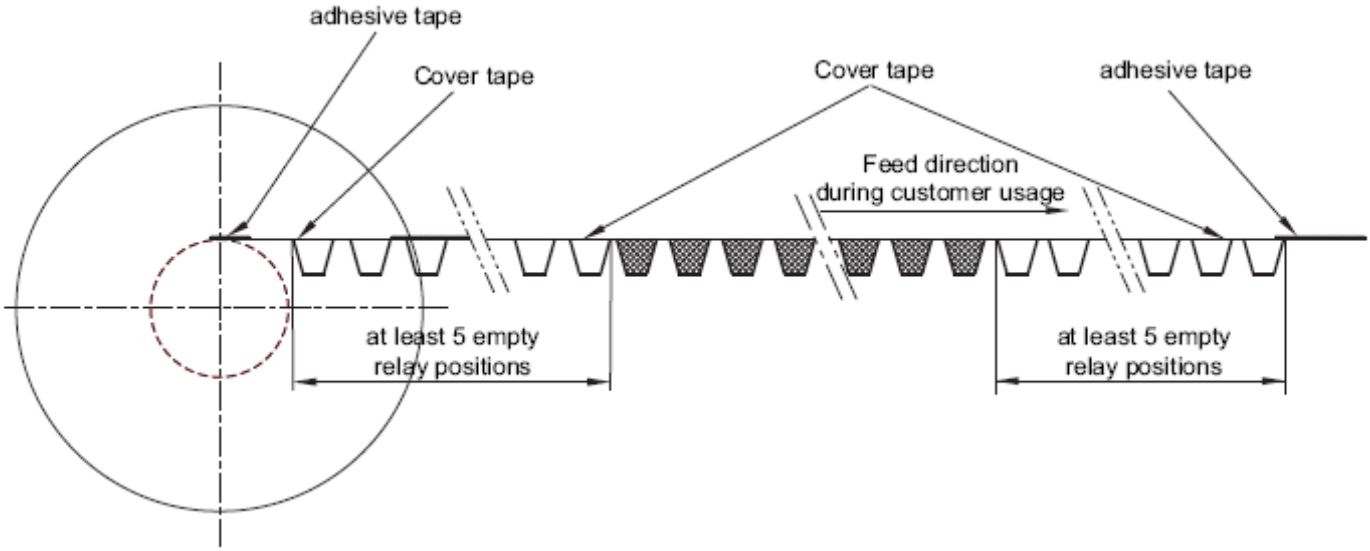


Note:

1) packing: 350pcs/reel, 4 reels/carton

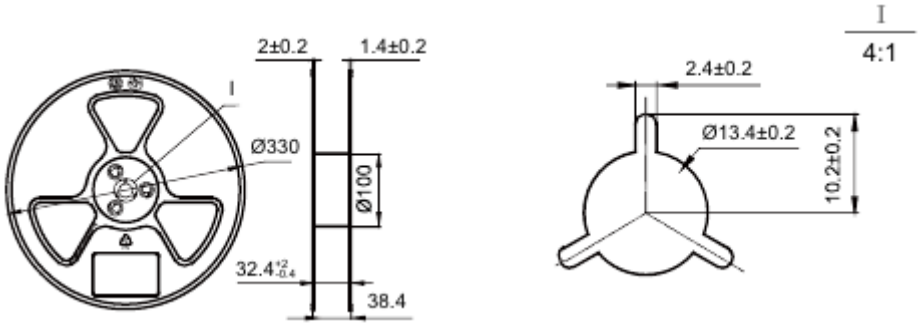
2) MOQ for reel packing is 700pcs





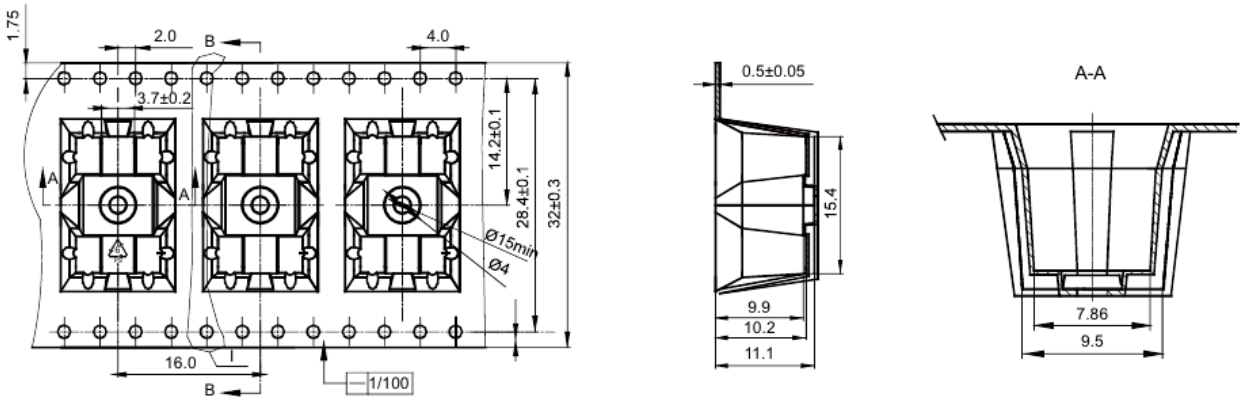
Reel Dimensions

.



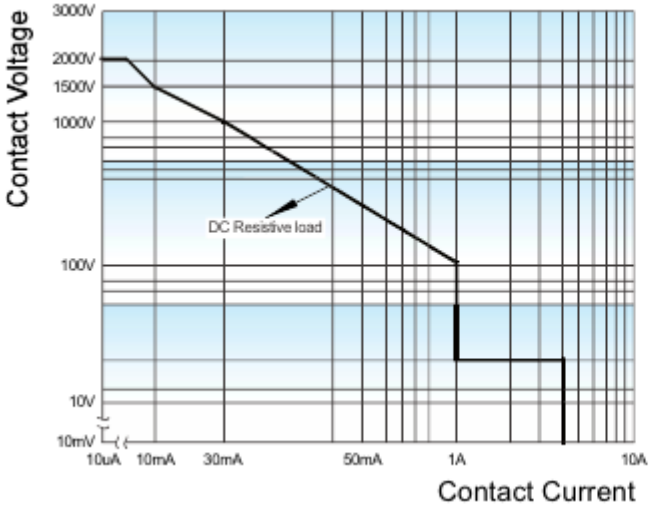
Tape Dimensions

(Standard SMT)

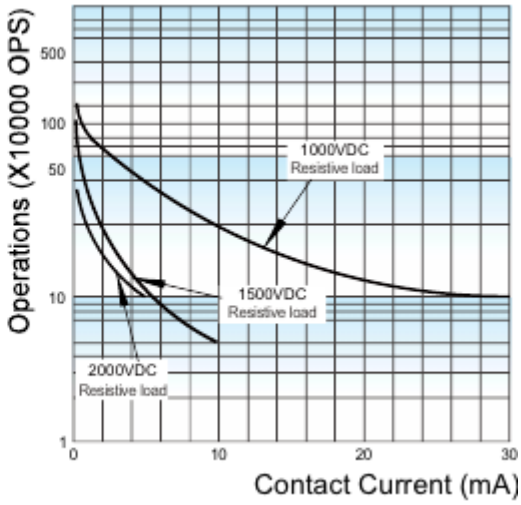


8. CHARACTERISTIC CURVES

Maximum Switching Power

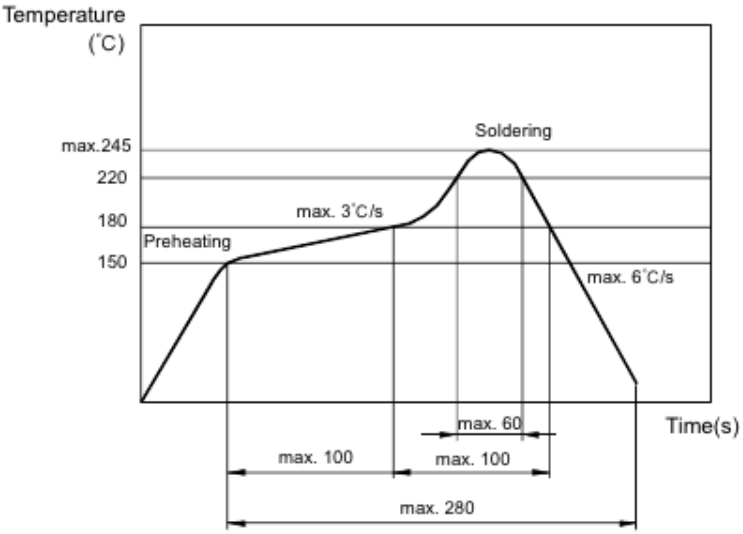


Endurance Curve



Reflow soldering, temperature on PCB board

Recommended soldering temperature



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 make 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, validation with real application should be done before your series production, if the reflow-soldering temperature curve is out of our recommendation. Generally, two-time reflow-soldering is not recommended for the relay. However, if two-time reflow-soldering is required, a 60min. interval should be guaranteed and a validation should be done before 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 until 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 erosion 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, silicon 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.
12) 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.