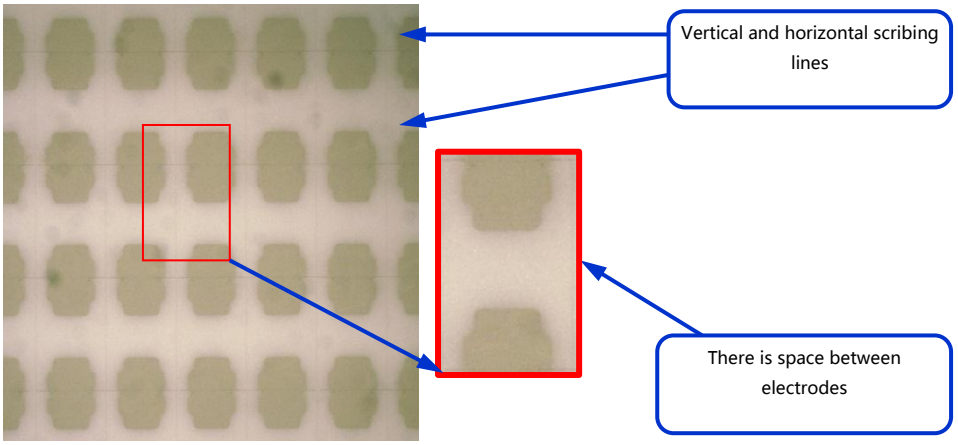
About the Appearance of the Electrodes at both Terminals of the Chip Resistor

§0.Description

The top electrodes on both sides of the chip resistor will not be completely covered and there will be a certain gap, which is a normal phenomenon and will not affect the electrode solderability and resistance performance. The specific causes are as follows

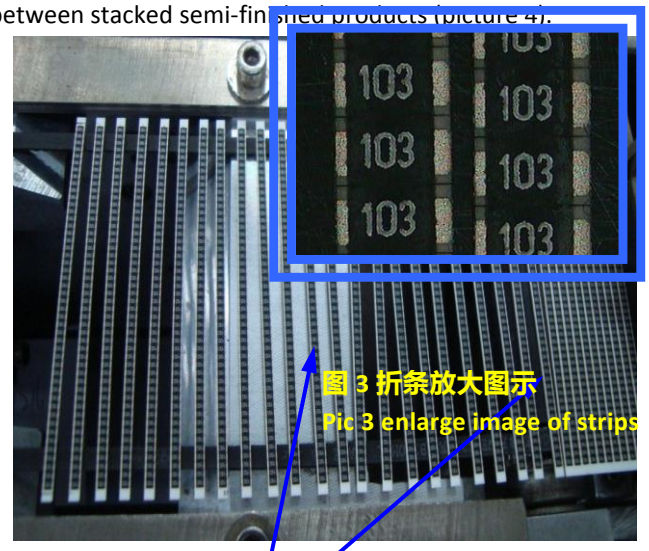
§1. Causes of missing electrodes at both ends of the resistors

1.1 As can be seen from the printing image of top electrodes (as shown in picture 1), top electrodes are printed in the way of granular printing.

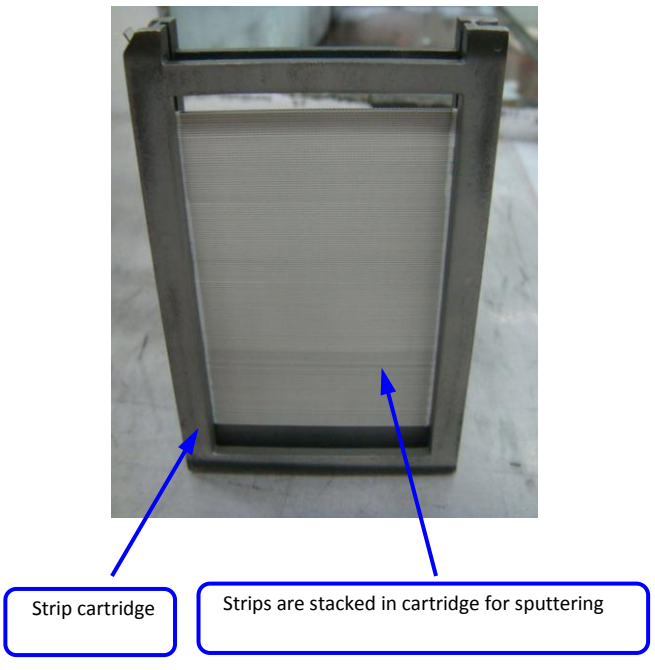


Pic 1 Positive electrode printing picture

1.2 After the substrates are broken into strips, they will be put into the sputtering cartridges. By observing the strips in the cartridges, it can be seen that the top electrodes are granular shape, and there are gaps between the chips (picture 3). When substrates are broken into strips and put into the sputtering cartridge, there are gaps between stacked semi-finished products (picture 4).



Pic 2 Breaking into strips



Pic 4 Stacking

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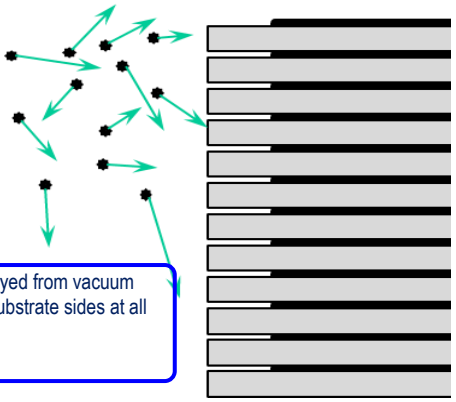
1.3 Vacuum sputtering chamber :

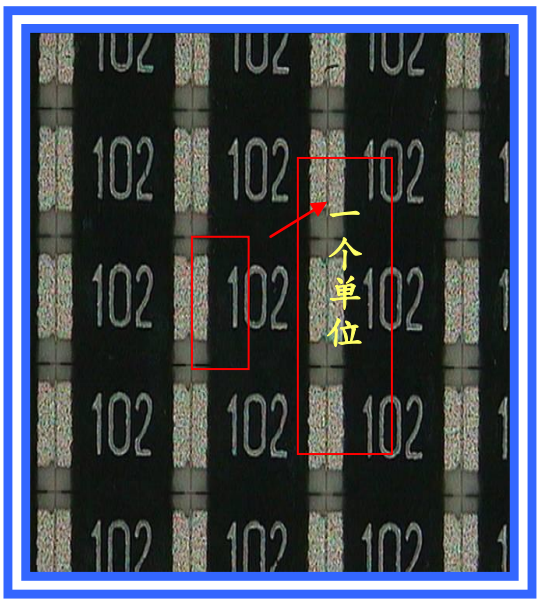
Pic.5 Vacuum sputtering chamber



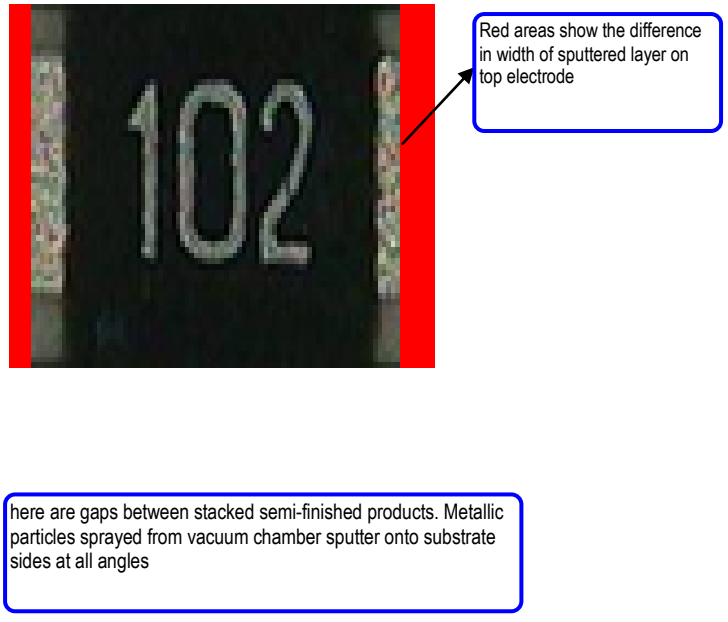
Pic 6 Stacking

Pic 7 Stacked strips

1.4 Before and after sputtering :



Pic 8 before vacuum sputtering



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1.5 After electroplating：

Pic 10 Electrodes after electroplating

1.6 Conclusion：

1.6.1 As there is a certain film thickness of semi-finished products printed with conductive layer, protective layer and marking; thus, there will be certain gaps between semi-finished products when stacked up, and the film thickness will be different between different products. Therefore, there will be difference in the depth and the amount of sputtered layer on the top electrodes: some sputtering depth is deep, the thickness of the material is slightly thick, some sputtering depth is shallow, or even no sputtered layer on the top electrodes.

1.6.2 After sputtering the terminal electrodes; electroplating process will be carried out, nickel layer and tin layer are plated on the materials and finally form the end electrode appearance the same as that of the product shown in the image, which is the normal phenomenon and won't affect solderability and resistor performance. This phenomenon also exists in products of competitors and won't affect customer application.

§2. Standard for the blank area at both sides of electrodes

The blank area of the top electrodes of the resistor shall not be greater than 50% of the total width of the substrate W (referring to terminal A or terminal B), please refer to pic 11 as follows.

Pic 11 image of the electrodes after electroplating