Abstract

Semiconductor device manufacturing process. The resulting oxi de layer will lead to decrease yields and increase production costs . With the more sophisticated components, its oxide layer on their inf luence is even more evident. After the end of this experiment whic h the use of direct etching. Direct plating that remove atmospheric contact of oxide factor. With such a simple and quick process, risk is low and improve yields greatly. In addition, the metallic silver have excellent electrical conductivity, so I select this plating metal.

In this study, using ethanol and hydrofluoric acid to deploy et ching solution in the Teflon tank. Prepared the silver nitrate into th e plating solution, using successive etching to join electrolysis plati ng. After anodic etching, the structure of porous silicon formed on the surface, and followed electroplating metal into the hole. The sil ver ions have better conductivity , that just rather than precious me tals, gold and platinum, and use in the study of heat and so on. T he study comprises four parts.

The first part, N-PS, PN-PS (the upper for the N-type, the lo wer the P-type) explore the structure of the specimen mainly . N-T ype has deep holes mainly, PN-PS has thin and deep holes in main.

The second part, using Maple PL (He-Cd laser) analys N-PS, PN-PS porous silicon materials and light-induced optical phenomen a research. Observation of luminescence intensity, wavelength red-s

hift and blue shift as well as the uniformity of its surface.

The third part, using SEM to explore the state of metal that fill holes and then to observe the EDS-Mapping the distribution of metal silver.

The fourth parts of the electrical characteristics, using CV, IV, measure and allow metal plating of metal-semiconductor junction t o form ohmic contacts.

Keywords: Semiconductor, Porous, PL, N-PS, PN-PS, Ohmic contacts.