Plasma Consult

2.45 GHz Microwave Plasma Source SLAN I-DS

Fig. 1: SLAN I-DS

Low-temperature fabrication of silicon films by large-area microwave plasma enhanced chemical vapor deposition

Proceedings of The Third Asian Conference on Chemical Vapor Deposition (Third Asian-CVD), - Third Asian CVD August 2005

The work described below was performed using a PlasmaConsult SLAN-I-DS microwave plasma source.

Jian-De Gu, Pei-Li Chen
Low-temperature fabrication of silicon films by large-area microwave plasma enhanced chemical vapor deposition
Institute of Optical Sciences, National Central University, Chung-Li, 320 Taiwan, ROC

Abstract

A novel designed microwave PECVD system with large-area microwave plasma source is employed for the feasibility study to grow thin silicon films at low temperature. With the total area being 25 cm_30 cm, three sets of array antenna composed by many copper rods with adjustable length are employed to couple the microwave power into the deposition chamber. A RF power source is employed to induce a negative bias on the substrates. High purity (99.99%) SiH4, H2, and Ar are introduced as reaction gases, and ultrasonically cleaned glasses are used as substrates. Silicon films with grain sizes about 80¨100 nm are successfully deposited at temperatures below 82 -C. Further studies will focus on the modification of the system design so as to reach the goals to deposit silicon films with improved crystallinity, larger grain sizes, and more uniformity over the large area.

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APPLICATION NOTE

SLAN I-DS