ABSTRACT

GAS-PHASE ADDITIVES FOR AN ENHANCEMENT OF LATERAL ETCH COMPONENT DURING HIGH DENSITY PLASMA FILM DEPOSITION TO IMPROVE FILM GAP-FILL CAPABILITY

A method for fabricating a silicon oxide and silicon glass layers at low temperature using High Density Plasma CVD with silane or inorganic or organic silane derivatives as a source of silicon, inorganic compounds containing boron, phosphorus, and fluorine as a doping compounds, oxygen, and gas additives is described. RF plasma with certain plasma density is maintained throughout the entire deposition step in reactor chamber. Key feature of the invention's process is a silicon source to gas additive mole ratio, which is maintained depending on the used compound and deposition process conditions. Inorganic halide-containing compounds are used as gas additives. This feature provides the reaction conditions for the proper reaction performance that allows a deposition of a film with good film integrity and void-free gap-fill within the steps of device structures.

(FIGURE 7 IS SUGGESTED FOR PUBLICATION)