METHOD FOR FABRICATING AN ULTRALOW DIELECTRIC CONSTANT MATERIAL AS AN INTRALEVEL OR INTERLEVEL DIELECTRIC IN A SEMICONDUCTOR DEVICE

A method for fabricating a thermally stable ultralow dielectric constant film comprising Si, C, O and H atoms in a parallel plate chemical vapour deposition process utilizing plasma enhanced chemical vapour deposition ("PECVD") process is disclosed. To enable the fabrication of thermally stable ultralow dielectric constant film, specific precursor materials are used, such as, cyclic siloxanes and organic molecules containing ring structures, for instance, tetramethylcycloterasiloxane and cyclopentene oxide. To stabilize plasma in the PECVD reactor and thereby improve uniformity of the deposited film, CO_2 is added to TMCTS as a carrier gas, or CO_2 or a mixture of CO_2 and O_2 are added to the PECVD reactor.

Fig. 3.



162162



G00002