

## Interface characterization and current conduction in low- $k$ SiOC(-H) thin films

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Carbon doped silicon oxides (SiOCH) thin films deposited by using plasma enhanced chemical vapor deposition (PECVD) is currently being used in interconnect applications. Optimizing the relationship between film properties and precursor structure will enable development of materials suitable for integration and use in multiple interlayer dielectrics (ILD) generations. Therefore, in addition to a low dielectric constant, ILD candidates must satisfy a large number of diverse requirements in order to be successfully integrated. One of this integration challenges with new ultra low- $k$  generation materials is their electrical properties and reliability issues. In this paper, we report on the frequency dependence of capacitance-voltage (C-V) and conductance-voltage (G-V) characteristics of the Al/SiOC(-H)/p-Si(100)/Al metal-insulator-semiconductor (MIS) structures. SiOC(-H) thinfilms are deposited with different radio frequency (rf) power ranging from 500 to 900 W by using plasma enhanced chemical vapor deposition (PECVD) system. The C-V and G-V measurements have been carried out in the frequency range of 1 kHz to 1 MHz. From this analysis, the detailed electrical properties in order to define the interface states of this MIS structures will be reported.