Title:

A Robust Embedded Ladder-oxide/Cu Multilevel Interconnect Technology for 0.13 mm CMOS Generation

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Abstract:

A robust embedded Ladder-oxide(k=2.9)/Cu multilevel interconnect is demonstrated for 0.13 μm CMOS generation. An inorganic ladder-oxide IMD is integrated into the Cu metallization with minimum wiring pitch of 0.34 μm, and a single damascene (S/D) Cu-plug structure is applied. An 18 % reduction in wiring capacitance is obtained compared with SiO2 IMD. The stress-migration lifetime of vias on wide metals for S/D Cu-plug is much longer than dual damascene. The reliability test results such as electromigration (EM), TDDB of Cu interconnect, and pressure cooker test (PCT) are quite acceptable. Moreover, high flexibility in thermal design and packaging is obtained.