SEMICONDUCTOR DEVICE ADHESIVE LAYER STRUCTURE AND PROCESS FOR FORMING STRUCTURE

Abstract of the Disclosure

The formation of an adhesion/interlayer region (410) of a semiconductor substrate device (404) before barrier layer (412) deposition provides improved adhesion of the barrier layer (412) to the underlying dielectric (404) and increases strength to the next interconnect layer without altering the function of the barrier layer (412) to limit Cu diffusion into the dielectric substrate (404). The adhesion/interlayer region (410) is formed in an inlaid structure (400, 500) of a semiconductor wafer. The inlaid structure (400, 500) is connected to upper or lower metal layers through vias in the dielectric layer (404) to a copper layer. The adhesion/interlayer region is formed by flowing a treating gas in a glow discharge process of the dielectric substrate in a chamber either attached or separated from the barrier deposition chamber (300). The barrier layer (412) and the adhesion/interlayer region (410) can be formed in this inlaid structure (400, 500) of a semiconductor wafer. The treating gas (212, 320) can be nitrogen, hydrogen, gases containing carbon atoms, or some other suitable gas.

FIG. 6 to accompany abstract.