

METHOD FOR FORMING ELECTROMIGRATION-RESISTANT STRUCTURES BY DOPING

ABSTRACT

A method for forming a copper (56, 58; 88; 90; 100) in an electronic structure (50) comprises depositing a copper composition in a receptacle formed in the electronic structure, then adding impurities into the copper composition so its electromigration resistance is improved. The copper composition can be deposited by, for example, electroplating, physical vapor deposition and chemical vapor deposition. The impurities include C, O, Cl, S and N at a suitable concentration range between about 0.01 ppm by weight and about 1000 ppm by weight. The method may further include the step of ion-implanting at least one element into a surface layer of the copper conductor (56, 58; 88; 90; 100) after the conductor (56, 58; 88; 90; 100) is first planarized. The surface layer may have a thickness between about 30 and about 500. The least one element may be selected from Co, Al, Sn, In, Ti and Cr.

Fig 2

This Sheet Has Been Replaced

