

METHODS OF FABRICATING ELECTRONIC DEVICES USING DIRECT COPPER PLATING

ABSTRACT

The present invention relates to methods and structures for the metallization of semiconductor devices. One aspect of the present invention is a method of forming a semiconductor device having copper metallization. In one embodiment, the method includes providing a patterned wafer having a diffusion barrier for copper; depositing a copperless seed layer on the diffusion barrier effective for electrochemical deposition of gapfill copper. The seed layer is formed by a conformal deposition process and by a nonconformal deposition process. The method further includes electroplating copper gapfill onto the seed layer. Another aspect of the invention includes electronic devices made using methods and structures according to embodiments of the present invention.

[FIG.1]