Abstract

SEMICONDUCTOR DEVICE AND METHOD OF FORMING INTEGRATED PASSIVE DEVICE MODULE

A method of manufacturing a semiconductor device includes providing a substrate with an insulation layer disposed on a top surface of the substrate, forming a passive device over the top surface of the substrate, removing the substrate, depositing an insulating polymer film layer over the insulation layer, and depositing a metal layer over the insulating polymer film layer. A solder mask can be formed over the metal layer. A conformal metal layer can then be formed over the solder mask. A notch can be formed in the insulation layer to enhance the connection between the insulating polymer film layer and the insulation layer. Additional semiconductor die can be electrically connected to the passive device. The substrate is removed by removing a first amount of the substrate using a back grind process, and then removing a second amount of the substrate using a wet dry, dry etch, or chemical-mechanical planarization process. (Fig. 2f)