World Academy of Science, Engineering and Technology
International Journal of Electronics and Communication Engineering
Vol:9, No:06, 2015

Substrate Coupling in Millimeter Wave Frequencies

Authors : Vasileios Gerakis, Fontounasios Christos, Alkis Hatzopoulos

Abstract : A study of the impact of metal guard rings on the coupling between two square metal pads is presented. The structure is designed over a bulk silicon substrate with epitaxial layer, so the coupling through the substrate is also involved. A lightly doped profile is adopted and is simulated by means of an electromagnetic simulator for various pad distances and different metal layers, assuming a 65 nm bulk CMOS technology. The impact of various guard ring design (geometrical) parameters is examined. Furthermore, the increase of isolation (resulting in reduction of the noise coupling) between the pads by cutting the ring, or by using multiple rings, is also analyzed. S parameters are used to compare the various structures.

Keywords : guard rings, metal pad coupling, millimeter wave frequencies, substrate noise,
Conference Title : ICECE 2015 : International Conference on Electronics and Communication Engineering
Conference Location : Toronto, Canada
Conference Dates : June 15-16, 2015