Abstracts

Simultaneous realization of millimeter wave uniplanar shunt stubs and dc block

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The exploitation of the potentialities linked to uniplanar technology for telecommunications is only at its beginning and even if significant advances have been realized, the context remains evolutive. This paper therefore proposes a new concept for the generation of millimeter wave uniplanar shunt stubs by means of slotline resonator instead of coplanar line resonators. Thus, the short end slotline stub has now the ability to be configured as shunt and series stubs, and therefore acts as a bandpass and bandstop filter respectively. This gives additional degrees of freedom to the design. Compared to the existing CPW short-end shunt stub, the advantages which may be derived from the use of the proposed framework are: additional degrees of freedom, lower radiation loss, larger bandwidth, high compactness and a reduction of the number of air bridges which are potentially expensive to build. Its worth noting that the new short end shunt stubs provides both bandpass behavior and dc blocking simultaneously which is not the case for the standard CPW shunt stub. Furthermore, the present paper proves that the capability to generate shunt stubs in slot line form allows one also to relax the limitations inherent to the realization of low and high impedance levels. In this way, various shunt stubs in slotline form with proposed geometries including rectangular and slot ring shapes are fabricated and accurate on-wafer measurements are performed over a large band of interest (1-50 GHz), The realization of these shunt stubs is detailed and also confirmed with experimental results.

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