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Title

Wideband planar Goubau line integrated circuit components at millimetre waves

Source

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Abstract

This study provides the design, fabrication and test results of passive planar Goubau line (PGL) components compatible with active micro-strip circuits, in millimeter(mm)-wave frequency range (40-60 GHz). Such wideband passive components are of interest in designing wideband digital wireless communication equipment. Basic passive components of this study include: two PGLs with conductor strip widths of 50 and 260 m, respectively, transitions from chosen PGLs to 50 micro-strip circuit, PGL loads and PGL power divider/combiners. Active components such as planar micro-strip circuits can be placed in tandem with passive PGLs using above transitions to design wide band circuits from microwaves to mm waves. PGL is formed by a planar conductor deposited on a standard 0.254 mm (10 mil) planar alumina substrate (ceramic) as opposed to the standard Goubau line made with a circular conductor and a circular dielectric. Passive PGL components are designed, simulated, fabricated and measured with an automatic network analyser (ANA) and test fixture. Simulation and test data support PGL component designs. PGL components operate well over a wide frequency range (from 40 to about 60 GHz). Similar results are expected with PGL at other mm-wave frequencies (below 40 GHz and above 60 GHz) and at terahertz frequencies (above 100 GHz). (14 References).