

Measurement of millimeter wave components with network analyzers in waveguide technology

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Abstract

Waveguides are essential for millimeter waves because of their precision and low losses especially in the field of measurements e. g. with network analyzers (NA). The main principles of such systems are based either on frequency-conversion, as in homodyne or heterodyne NA, or on multiple power measurements as in sixport- reflectometers. Certain millimeter wave components like couplers and mixers are necessary in all versions of NA. The design and the manufacturing of a waveguide coupler are described and measurement results are shown. With a mixer it is demonstrated how the dimensional problem between diodes and waveguides can be solved. A millimeter wave NA is built with these components. The special usefulness of waveguides for NA and filters are emphasized by measurements with a heterodyne and a homodyne NA.

Bernd Geck, Jürgen Marquardt
