Abstracts

A broad-band microstrip-to-waveguide transition using quasi-Yagi antenna

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A novel microstrip-to-waveguide transition utilizing a coplanar-strip Yagi-like antenna is presented. The compact and single-layered quasi-Yagi antenna fabricated on high dielectric-constant substrate has end-fire radiation patterns. This monolithic-microwave integrated-circuit (MMIC)-compatible antenna is inserted in the E-plane of the rectangular waveguide to launch the TE/sub 10/ dominant mode. With this new scheme of excitation, compact design and low-cost fabrication is achieved without requiring multilayered substrate or backshort hermetic sealing. This transition, in addition, achieves very broad bandwidth and relatively low insertion loss. The transition's broad-band characteristics are analyzed, and optimization guidelines for individual components of the transition are discussed in detail. A tolerance study proves that the transition is robust in mechanical alignment. The X-band transition with alumina substrate demonstrates 35% bandwidth with return loss better than -12- and -0.3-dB insertion loss at the center frequency. This transition should find wide applications due to its high compatibility with microwave-integrated-circuit/MMIC technology and very low fabrication cost.

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