Abstracts

A novel waveguide-to-microstrip transition for millimeter-wave module applications

F.J. Villegas, D.I. Stones and H.A. Hung. "A novel waveguide-to-microstrip transition for millimeter-wave module applications." 1999 Transactions on Microwave Theory and Techniques 47.1 (Jan. 1999 [T-MTT]): 48-55.

A novel waveguide-to-microstrip transition is developed using a new design methodology based on iris coupling. Key features of the design are a single-layer substrate, new matching topology, and new cavity enclosure. The transition lends itself to a low-cost implementation, while maintaining the enclosure's hermetic integrity. An extensive tolerance study shows that the present design is robust and very stable with respect to manufacturing and assembly variations. Careful consideration has been given to the mechanical aspects of the transition's implementation in order to achieve seamless integration into the overall package manufacturing and assembly process without sacrificing electrical performance. Proof of concept was achieved by implementing a Q-band (f/sub 0/=44.5 GHz) design on alumina, a W-band (f/sub 0/=94 GHz) design on z-cut quartz, and a W-band design on fused silica. All exhibited better than 22 dB return loss at their center frequencies with less than 0.3 dB insertion loss, and at minimum a 10% 15 dB return-loss bandwidth.

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