Abstracts

A 60-GHz-band planar dielectric waveguide filter for flip-chip modules (Dec. 2001 [T-MTT])

M. Ito, K. Maruhashi, K. Ikuina, T. Hashiguchi, S. Iwanaga and K. Ohata. "A 60-GHz-band planar dielectric waveguide filter for flip-chip modules (Dec. 2001 [T-MTT])." 2001 Transactions on Microwave Theory and Techniques 49.12 (Dec. 2001 [T-MTT] (Special Issue on 2001 International Microwave Symposium)): 2431-2436.

A planar dielectric waveguide filter with coplanar waveguide (CPW) I/O ports suitable for flip-chip bonding is proposed and is demonstrated for 60-GHz-band applications. The filter is formed incorporating metallized through holes in an alumina substrate. In order to improve stopband rejection, short-circuited CPW resonators with a half-wavelength are added to waveguide-to-CPW transitions. A fabricated four-resonator filter exhibits an insertion loss of 3.2 dB with a 3-dB bandwidth of 3.0 GHz and rejection of 35 dB at 3-GHz lower separation from a center frequency of 59.5 GHz. The filter is mounted by using flip-chip bonding in a multilayer ceramic package with structures to suppress parasitically propagating electromagnetic waves. No degradation of the stopband rejection is observed from 50 to 80 GHz.

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