Abstracts

Low-loss micromachined filters for millimeter-wave communication systems

P. Blondy, A.R. Brown, D. Cros and G.M. Rebeiz. "Low-loss micromachined filters for millimeter-wave communication systems." 1998 Transactions on Microwave Theory and Techniques 46.12 (Dec. 1998, Part II [T-MTT] (1998 Symposium Issue)): 2283-2288.

High-performance planar micromachined filters at 37 and 60 GHz are presented. The filters consist of a 3.5% bandwidth two-pole Chebyshev filter with transmission zeros at 37 GHz, 2.7% and 4.3% bandwidth four- and five-pole Chebyshev filters at 60 GHz, and an 8% bandwidth elliptic filter at 60 GHz. Silicon micromachining techniques combined with micropackaging have been applied to allow for very high-Q resonators resulting in low-loss filters. The 37-GHz two-pole filter exhibits a 2.3-dB port-to-port insertion loss. The 2.7% and 4.3% four- and five-pole Chebyshev filters at 60 GHz exhibit 2.8- and 3.4-dB insertion loss, and the 8% elliptic filter exhibits a 1.5-dB insertion loss. These values show a large reduction of insertion loss compared to conventional planar techniques, and can be used for planar low-cost millimeter-wave wireless communication systems.

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