Abstracts

A new micromachined overlay CPW structure with low attenuation over wide impedance ranges and its application to low-pass filters

Hong-Teuk Kim, Sanghwa Jung, Jae-Hyoung Park, Chang-Wook Baek, Yong-Kweon Kim and Youngwoo Kwon. "A new micromachined overlay CPW structure with low attenuation over wide impedance ranges and its application to low-pass filters." 2001 Transactions on Microwave Theory and Techniques 49.9 (Sep. 2001 [T-MTT] (Mini-Special Issue on the 2001 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 1634-1639.

In this paper, a new micromachined overlay-coplanar-waveguide (OCPW) structure has been developed and its characteristics are studied in detail as a function of the line parameters. In OCPW, the edges of the center conductors are lifted by micromachining techniques and partially overlapped with the ground plane to facilitate low-impedance lines. The elevated center conductors help to reduce the conductor loss by redistributing the current over a broad area. Comparative experiments on low-loss and lossy substrates also confirm the screening effect from the substrate losses by confining the electric field in the air between the overlapped conductor plates. Compared with the coplanar-waveguide (CPW) lines, the OCPW lines show wider impedance range (25-80 /spl Omega/) and lower loss (<0.95 dB/cm at 50 GHz). The advantages of OCPW for low-Z/sub 0/ lines are utilized to realize a high-performance stepped-impedance low-pass filter at X-band. The OCPW filter shows distinct advantages over the conventional CPW filter in terms of size, loss, skirt, and stopband characteristics.

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