Abstracts

New phase shifters and phased antenna array designs based on ferroelectric materials and CTS technologies (2001 Vol. I [MWSYM])

M.F. Iskander, Zhijun Zhang, Z. Yun, R. Isom, M. Hawkins, R. Emrick, B. Bosco, J. Synowczynski and B. Gersten. "New phase shifters and phased antenna array designs based on ferroelectric materials and CTS technologies (2001 Vol. I [MWSYM])." 2001 MTT-S International Microwave Symposium Digest 01.1 (2001 Vol. I [MWSYM]): 259-262 vol.1.

As the search continues for low-cost and high-performance components for the front-end devices for wireless communications systems, the focus has been on the use of MEMS technology; but some attention has recently been given to exploring new and innovative designs based on the Ferroelectric and the Continuous Transverse Stubs (CTS) technologies. In this paper we present new phase shifter designs and an integrated phased array antenna system based on the use of multilayer ferroelectric materials. Simulation results show that with the appropriate selection of the materials properties and the dimensions of the multilayer dielectric system, insertion losses may be reduced by as much as a factor of 100. These results also show that while only a slight reduction (15%) in the maximum achievable tunability was observed, it was possible to achieve significant improvement in the impedance matching characteristics. A procedure to enhance the radiation efficiency from an integrated ferroelectric/CTS phased antenna array design will be described and specific array designs discussed.

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