Abstracts

New phase shifters and phased antenna array designs based on ferroelectric materials and CTS technologies (Dec. 2001 [T-MTT])

M.F. Iskander, Zhijun Zhang, Zhengqing Yun, R.S. Isom, M.G. 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 (Dec. 2001 [T-MTT])." 2001 Transactions on Microwave Theory and Techniques 49.12 (Dec. 2001 [T-MTT] (Special Issue on 2001 International Microwave Symposium)): 2547-2553.

As the search continues for low-cost and high-performance components for the front-end devices for wireless communications systems, some focus has been placed on exploring new and innovative designs based on ferroelectric technology. In this paper, we present new phase-shifter designs and an integrated phased-array antenna system based on the use of multilayer ferroelectric materials and the continuous transverse stub (CTS) technologies. 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 impedance-matching characteristics. A procedure to enhance the radiation efficiency from an integrated ferroelectric/CTS phased antenna array design is described and specific array designs are discussed.

❑ Return to main document.