Abstracts

Optimization of distributed MEMS transmission-line phase shifters-U-band and W-band designs

N.S. Barker and G.M. Rebeiz. "Optimization of distributed MEMS transmission-line phase shifters-U-band and W-band designs." 2000 Transactions on Microwave Theory and Techniques 48.11 (Nov. 2000, Part I [T-MTT] (Mini-Special Issue on RF/Microwave Applications in Medicine)): 1957-1966.

The design and optimization of distributed micromechanical system (MEMS) transmission-line phase shifters at both U- and W-band is presented in this paper. The phase shifters are fabricated on 500 /spl mu/m quartz with a center conductor thickness of 8000 /spl Aring/ of gold. The U-band design results in 70/spl deg//dB at 40 GHz and 90/spl deg//dB at 60 GHz with a 17% change in the MEMS bridge capacitance. The W-band design results in 70/spl deg//dB from 75 to 110 GHz with a 15% change in the MEMS bridge capacitance. The W-band phase-shifter performance is limited by the series resistance of the MEMS bridge, which is estimated to be 0.15 /spl Omega/. Calculations demonstrate that the performance of the distributed MEMS phase shifter can be greatly increased if the change in the MEMS bridge capacitance can be increased to 30% or 50%. To our knowledge, these results present the best published performance at 60 and 75-110 GHz of any nonwaveguide-based phase shifter.

❑ Return to main document.