Abstracts

Optimization of distributed MEMS phase shifters

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The design and optimization of a 0-60 GHz distributed MEMS true-time delay phase shifter is presented with theory verified by experimental results. The phase shifters are fabricated on 500 /spl mu/m quartz with a fixed total CPW width of 300 /spl mu/m. Three lines with center conductor widths of 50, 100, and 150 /spl mu/m have been fabricated. The line with a 100 /spl mu/m center conductor width is shown to be optimal for phase shift per dB loss. The measured results demonstrate 70/spl deg//dB at 40 GHz and 900/dB at 60 GHz. The current design, with C/sub max//C/sub min/=1.17, is capable of producing 360/spl deg/ phase shift at 40 GHz with 5.1 dB loss and at 60 GHz with 4 dB loss which is state-of-the art performance for millimeter-wave phase shifters. Also, it is shown that if a C/sub max//C/sub min/=1.3 can be achieved, then the performance increases to 1000/dB at 40 GHz.

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