Abstracts

Theory of digital phase shifters based on high-T/sub c/ superconducting films

I.B. Vendik, O.G. Vendik, E.L. Kollberg and V.O. Sherman. "Theory of digital phase shifters based on high-T/sub c/ superconducting films." 1999 Transactions on Microwave Theory and Techniques 47.8 (Aug. 1999 [T-MTT] (Mini-Special Issue on Low-Power/Low-Noise Technologies for Mobile Wireless Communications)): 1553-1562.

A theory of digital phase shifters based on transition from a superconducting (S) state into a normal (N) state in high-T/sub c/ superconductor (HTS) films is developed. It is shown that the insertion-loss level in the phase shifters is determined by the commutation quality of the HTS film and does not depend on the S-N switching element shape and size. The procedure for designing the S-N phase shifter with minimum insertion loss is equivalent to designing a matching circuit for the termination Z=/spl radic/R/sub S/R/sub N/ (R/sub S/ and R/sub N/ are the resistances of the switching element in the S- and N-states, respectively). Different versions of S-N phase shifters are suggested and discussed. High-quality S-N phase shifters can be successfully designed in a 1-10 GHz frequency range and find application on the receiving end of microwave systems.

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