Abstracts

Design of Loaded-Line p-i-n Diode Phase Shifter Circuits

I.J. Bahl and K.C. Gupta. "Design of Loaded-Line p-i-n Diode Phase Shifter Circuits." 1980 Transactions on Microwave Theory and Techniques 28.3 (Mar. 1980 [T-MTT]): 219-224.

The design of three types of loaded-line p-i-n diode digital phase shifter circuits is presented. The three configurations considered are 1) main line mounted, 2) stub mounted, and 3) switchable stub length. Expressions for various design parameters are derived. Calculations show that for the 22.5° phase bit the maximum bandwidths for three circuits are 22.7, 19.2, and 18.4 percent, respectively. Starting from the p-i-n diode parameters, optimum designs of these circuits for obtaining minimum insertion loss, maximum bandwidth, and minimum size are also discussed. It is found that the switchable stub length type configuration is suitable when nearly ideal p-i-n diodes are used while stub mounted type configuration is suitable for nonideal diodes. Experimental and theoretical performance (bandwidth and insertion loss) of stub mounted type circuits are compared and found to be in good agreement.

❑ Return to main document.