Abstracts

Microwave variable delay line using dual-frequency switching-mode liquid crystal

T. Kuki, H. Fujikake and T. Nomoto. "Microwave variable delay line using dual-frequency switching-mode liquid crystal." 2002 Transactions on Microwave Theory and Techniques 50.11 (Nov. 2002 [T-MTT] (Mini-Special Issue on the 2002 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 2604-2609.

A method was investigated to reduce the insertion loss and response time in the phase shift in a microwave variable delay line using liquid crystal (LC). In variable delay lines using conventional nematic LC, reducing the insertion loss conflicts with reducing the phase-shift response-time dependence on the thickness of the LC layer; thus, it is very difficult to simultaneously satisfy both requirements. Here, the use of dual-frequency switching-mode liquid crystal (DFSM LC) for the variable delay line is demonstrated as one approach to solving this problem. By using the characteristics of DFSM LC, in that the alignment of the LC can be controlled with a control voltage and its frequency, it becomes possible to control the LC alignment to be in an always electrically driven condition by applying a combination of control voltages of dc and several kilohertz. Experimental results of a microwave variable delay line using DFSM LC show that it is possible to reduce both the phase-shift response time and insertion loss.

❑ Return to main document.