Abstracts

High-performance air-gap transmission lines and inductors for millimeter-wave applications

Inho Jeong, Seong-Ho Shin, Ju-Hyun Go, Joong-Soo Lee, Choong-Mo Nam, Dong-Wook Kim and Young-Se Kwon. "High-performance air-gap transmission lines and inductors for millimeter-wave applications." 2002 Transactions on Microwave Theory and Techniques 50.12 (Dec. 2002 [T-MTT] (Special Issue on 2002 International Microwave Symposium)): 2850-2855.

The air-gap transmission lines and inductors are developed by new multilayer process. The developed transmission lines are air-gap coaxial line, air-gap strip line, air-gap coplanar waveguides (CPW), and air-gap buried microstrip line (BMSL). The air-gap transmission lines show very low signal loss and very high isolation performances. The transmission line loss of the coaxial line is less than 0.08 dB/mm up to 40 GHz. Those of the CPW, strip line and BMSL are about 0.07, 0.15, and 0.13 dB/mm, respectively. The isolation characteristics of the coaxial line and BMSL are measured. In case of the coaxial line with 2-mm coupling length and 60-/spl mu/m distance between signal lines, the coupling is less than -52 dB up to 40 GHz. In case of the BMSL with the same conditions, the coupling is less than -43 dB. Therefore, the air-gap transmission line is very suitable structure for high performance and high-density RF application. Additionally, the air-gap inductors are monolithically fabricated using the same process of the transmission line. The fabricated inductors have very high quality factors, the maximum Q factor of 1.46-nH air-gap inductor is about 130. Using the developed multilayer process, we can realize various types of air-gap transmission lines (coaxial line, CPW, strip line and BMSL) and air-gap inductors simultaneously.

❑ Return to main document.