Abstracts

Distributed coupling model of the dielectric resonator to microstrip line

Xiaoming Xu and R. Sloan. "Distributed coupling model of the dielectric resonator to microstrip line." 1999 Microwave and Guided Wave Letters 9.9 (Sep. 1999 [MGWL]): 348-350.

A three-dimensional (3-D) electromagnetic (EM) study shows that the magnetic coupling between a dielectric resonator (DR) and a microstrip line is appreciable over a length greater than the diameter of the DR. The effect of this distribution should be considered when modeling the coupling. A new circuit model is introduced representing the coupling as distributed, and an integral method is used to calculate circuit parameters efficiently. Numerical comparison shows that the new model provides better results than the conventional lumped model. In the calculated example, the 3-dB frequency response is reduced from 31 MHz (via the conventional model) to 9.0 MHz (new distributed model) which approaches 6.6 MHz, the result from EM calculation. The equivalent distributed circuit can be easily included in circuit simulators such as Libra/sup TM/, and could prove invaluable in the design of DR oscillators.

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