Abstracts

Application of defected ground structure in reducing the size of amplifiers

Jong-Sik Lim, Jun-Seok Park, Young-Taek Lee, Dal Ahn and Sangwook Nam. "Application of defected ground structure in reducing the size of amplifiers." 2002 Microwave and Wireless Components Letters 12.7 (Jul. 2002 [MWCL]): 261-263.

This letter presents a new technique to reduce the size of microwave amplifiers using a defected ground structure (DGS). The DGS on the ground plane of a microstrip line provides an additional effective inductive component, which enables a microstrip line with very high impedance to be realized and shows slow-wave characteristics. The resultant electrical length of the microstrip line with DGS is longer than that of a conventional line for the same physical length. Therefore, the microstrip line with DGS can be shortened in order to maintain the same electrical length, matching, and performances of the basic (original) amplifier. To confirm the validity of this idea, two amplifiers, one of which is designed using a conventional microstrip line and the other is reduced using DGS, are fabricated, measured, and compared. The performance of the reduced amplifier with DGS is quite similar to that of the basic amplifier, even though the series microstrip lines with DGS are much smaller than those of the basic amplifier by 53.8% and 55.6% at input and output matching networks, respectively.

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