Analysis and Design of Gap-Filler of DAB System

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ABSTRACT

ABSTRACT This research is aimed at designing a signal repeater, that is so-called gap filler, to solve the problem of the dead zone of DAB broadcasting signal due to building blockage. Beside providing the function of solving the dead zone problem, this repeater can also relay and improve the signal quality which are blocked by the buildings. The work mentioned in this study is to design a first stage low noise amplifier with frequency range between 170MHz and 240MHz for digital radio, and to investigate the appropriate transmit power and antenna to match the amplifier. The active device used in this low noise amplifier design is BFG25W by Philips Company. For designing the amplifier, I first used the design software Microwave Office 2000 to simulate the circuit and then implemented the impedance matching according to the theory of RF circuit. To obtain the best performance, I used a great deal of surface mounted devices in achieving the impedance matching for this specified frequency range. The low noise amplifier is made on the printed circuit board and its S parameter measured by the Agilent network analyzer.

Keywords : DAB ; Digital Audio Broadcasting ; Gap Filler ; LNA ; Low Noise Amplifier ; RF Circuit ; Radio Frequency Circuit ; SMD ; Surface Mounted Device ; Lump Element ; NA ; Network Analyzer

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