DESIGN A HAIRPIN BANDPASS FILTER FOR 5 GHZ UNLICENSED WIMAX BAND

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ABSTRACT

Nowadays, the need for high speed data packet access is increased rapidly. As the demands is increased, there are a lot of technologies arise to fulfill this demand. One of the latest technologies that just enter Malaysia's market is WiMax technology. WiMax system uses a whole new transmission technique known as OFDM that have relatively high spectrum-use efficiency. Beside the transmission technique, WiMax systems also use a high technology antenna called MIMO. With this advance technique used, a proper filtering needs to be produced. The filters also need to be small in size and compact due to the demand of the industry and the size of the board.

This project presents a hairpin bandpass filter design for 5 GHz unlicensed WiMax band. The filter is designed at 5.788 GHz centre frequency, with a bandwidth of 125 MHz bandwidth that is about 0.02% of its centre frequency, 0.1 dB ripples and consists of 3 elements. It is then simulated using Computer Simulation Technology (CST), then be fabricated on Roger 4350B that have a dielectric constant, ε_r of 3.48 and substrate thickness, h of 1.524 mm. The filter is then being measured using Vector Network Analyzer (VNA) and the measurement results show a good agreement with the simulation results.

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