

## Tri-Wide Band Polygon Filter

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In recent years, wireless communication facilities such as wireless transceivers has been exerting an increasingly vital impact in the field of microwave and radio frequency communication. One of the most important modules in wireless communication system is the filter [1-7]. Filters play a critical role in passing desired frequency bands and stopping the unwanted ones including noise signals. Therefore, performance of the filter greatly influences performance of the whole wireless communication system. With the requirements in the current increasingly stringent frequency spectrum resources and the development of advanced multi-standard wireless communication systems, multi-standard internal filters have become a necessity for the state-of-the-art multifunction "smart phones" and wireless transceivers for the mobile devices.

In this work, a novel multi-standard triple-wide band filter with a compact size has been designed and developed for wireless communication system such as mobile devices (see Fig. 1). This proposed filter covers a fundamental bandwidth of 460MHz with fractional bandwidth (FBW) of 13.1% centred at the 3.52GHz band, the first spurious bandwidth of 1.33GHz with FBW of 24.5% centred at the 5.425GHz and the second spurious bandwidth of 870MHz with FBW of 11.6% centred at the 7.515GHz while occupy a compact area of only 8.3mm by 13.7mm as shown in Fig.2. The multi-standard filter is designed, described and fully simulated. The Ansoft HFSS software simulated results agree well with the theory predictions. The featured broad bandwidths over dual applicable frequency bands and the miniaturized size of the proposed filter make it very promising for applications in multi-standard wireless communication.



Fig.1. The architecture of the proposed triple-wide band filter

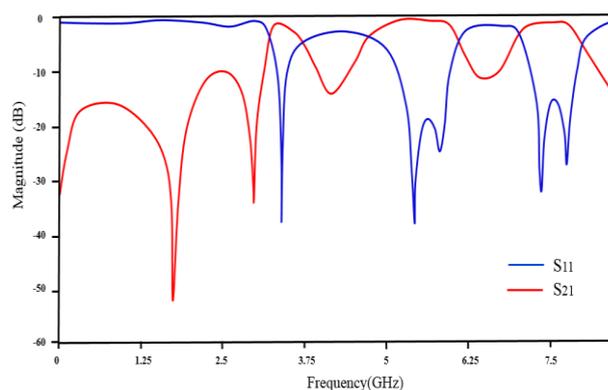


Fig.2. The frequency response results of the proposed triple-band filter

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