

A Design of a Quadplexer Consisting of BPFs Using Different Tapped Resonators

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In the planar passive circuits, a resonator, a filter and a multiplexer are the essential key circuits in recent technical trends. In general, various studies have been conducted on out-of-band rejection and downsizing of microwave filters. It is, however, difficult to accomplish the two demands mentioned above simultaneously because of the trade-off among the number of parts, cost and simplification of the structure. If control of the number of attenuation poles is possible by a simple approach, then, it is more effective to locate the attenuation poles near the pass-band used for duplexers and multiplexers. To achieve the requirements above, we use a bandpass filter (BPF) based on different tapped resonators. The advantage of the proposed BPF includes the compactness, and the control of the location and number of attenuation poles.

In this paper, a planar quadplexer consisting of BPFs using different tapped resonators are proposed, designed and calculated. Fig. 1 illustrates a schematic circuit of a quadplexer consisting of BPFs using different tapped resonators. In addition, Figs. 2 and 3 show the reflection, transmission and isolation characteristics of the quadplexer shown in Fig. 1. Referring to Figs. 1–3, it has been confirmed that the proposal enables the realization of the high-performance planar quadplexer theoretically.

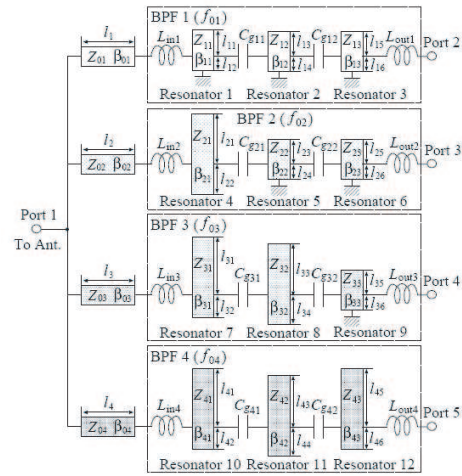


Figure 1: Schematic circuit of quadplexer consisting of BPFs using different tapped resonators.

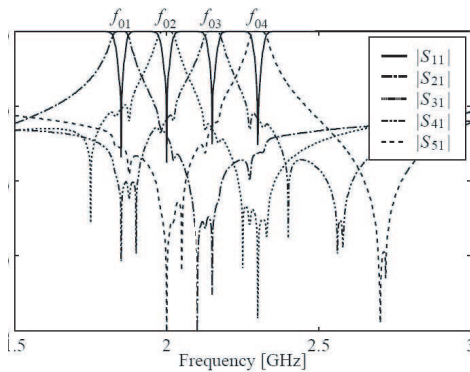


Figure 2: Theoretical results of the quadplexer shown in Fig. 1.

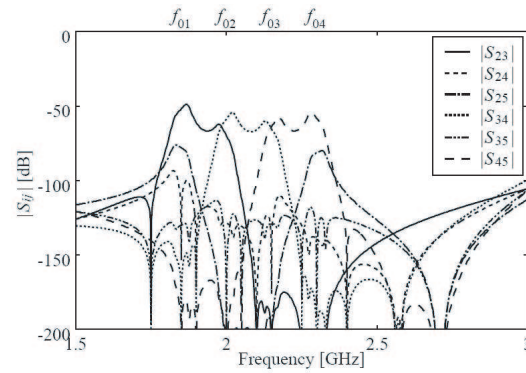


Figure 3: Isolation characteristics of the quadplexer shown in Fig. 1.