DYNAMIC BAND STEERING FILTER BANK MODULE

Field of the Disclosure

[0001] The present disclosure relates in general to radio frequency processing. In particular, the present disclosure relates to filter bank modules.

Background

[0002] To support the newly released Wireless Fidelity (Wi-Fi) spectrum at 6 GHz while supporting the existing Wi-Fi bands at 2.4 GHz and 5 GHz, customers use complex banks of filters, along with switches, diplexers, and an assortment of surface-mount technology matching components. As such, filter bank modules incorporating these components are relatively large in size and have relatively high cost and relatively poor performance. What is needed is a new type of filter bank module having a substantial reduction in size and cost while also substantially improving performance.

Summary

[0003] Disclosed is a filter bank module comprising a substrate, an antenna port terminal, and a filter bank die fixed to the substrate. The filter bank die comprises a first acoustic wave (AW) filter having a first antenna terminal coupled to the antenna port terminal and a first filter terminal, and a second AW filter having a second filter terminal, and a second antenna terminal coupled to the first antenna terminal to effectively diplex signals that pass through the first AW filter and the second AW filter, and a double-throw switch having a first throw terminal coupled to the first filter terminal and a second throw terminal coupled to the second filter terminal, a transmit pole terminal, and a receive pole terminal, wherein an insertion loss between either of the transmit pole terminal or the receive pole terminal and the antenna port terminal minus an insertion loss of either the first AW filter or the second AW filter is no greater than 1.2 decibels, and wherein a real estate area of the filter bank module is no greater than 4 square millimeters.

[0004] In some exemplary embodiments, at least one switch such as a single-pole double-throw switch or a multi-pole multi-throw switch is integrated within the filter bank module with the filter bank die. Also, in some exemplary embodiments, a low-noise amplifier is integrated with the switch and the filter bank die within the filter bank module. In further exemplary embodiments, a power amplifier is integrated with the low-noise amplifier, the switch, and the filter bank die within the filter bank module. Moreover, passive filters such as