DIVERSITY RECEIVER FRONT END SYSTEM WITH SWITCHING NETWORK

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims priority to U.S. Provisional Application No. 62/073,043 filed October 31, 2014, entitled DIVERSITY RECEIVER FRONT END SYSTEM, U.S. Provisional Application No. 62/073,041, filed October 31, 2014, entitled ADAPTIVE MULTIBAND LNA FOR CARRIER AGGREGATION, U.S. Application No. 14/727,739, filed June 1, 2015, entitled DIVERSITY FRONT END SYSTEM WITH VARIABLE-GAIN AMPLIFIERS, and U.S. Application No. 14/734,746, filed June 9, 2015, entitled DIVERSITY RECEIVER FRONT END SYSTEM WITH SWITCHING NETWORK, the disclosure of each of which is hereby expressly incorporated by reference herein in its entirety.

BACKGROUND

Field

[0002] The present disclosure generally relates to wireless communication systems having one or more diversity receiving antennas.

Description of the Related Art

[0003] In wireless communication applications, size, cost, and performance are examples of factors that can be important for a given product. For example, to increase performance, wireless components such as a diversity receive antenna and associated circuitry are becoming more popular.

[0004] In many radio-frequency (RF) applications, a diversity receive antenna is placed physically far from a primary antenna. When both antennas are used at once, a transceiver can process signals from both antennas in order to increase data throughput.

SUMMARY

[0005] In accordance with the present disclosure, there is provided a receiving system comprising:

a plurality of amplifiers, each one of the plurality of amplifiers disposed along a corresponding one of a plurality of paths between an input of the receiving system and an output of the receiving system and configured to amplify a signal received at the amplifier;

a switching network including one or more single-pole/single-throw switches, each one of the switches coupling two of the plurality of paths; and

a controller configured to receive a band select signal and, based on the band select signal, enable one of the plurality of amplifiers and control the switching network.

[0005A] The present disclosure also provides a radio-frequency (RF) module comprising:

a packaging substrate configured to receive a plurality of components; and

a receiving system implemented on the packaging substrate, the receiving system including a plurality of amplifiers, each one of the plurality of amplifiers disposed along a corresponding one of a plurality of paths between an input of the receiving system and an output of the receiving system and configured to amplify a signal received at the amplifier, a switching network including one or more single-pole/single-throw switches, each one of the switches coupling two of the plurality of paths, and a controller configured to receive a band select signal and, based on the band select signal, enable one of the plurality of amplifiers and control the switching network.

[0005B] The present disclosure still further provides a wireless device comprising:

a first antenna configured to receive a first radio-frequency (RF) signal;

a first front-end module (FEM) in communication with the first antenna, the first FEM including a packaging substrate configured to receive a plurality of components, the first FEM further including a receiving system implemented on the packaging substrate, the receiving system including a plurality of amplifiers, each one of the plurality of amplifiers disposed along a corresponding one of a plurality of paths

between an input of the receiving system and an output of the receiving system and configured to amplify a signal received at the amplifier, a switching network including one or more single-pole/single-throw switches, each one of the switches coupling two of the plurality of paths, and a controller configured to receive a band select signal and, based on the band select signal, enable one of the plurality of amplifiers and control the switching network; and

a transceiver configured to receive a processed version of the first RF signal from the output via a cable and generate data bits based on the processed version of the first RF signal.

[0005C] In some implementations, the present disclosure relates to a receiving system comprising a plurality of amplifiers. Each one of the plurality of amplifiers is disposed along a corresponding one of a