

ABSTRACT

[0097] A multimode antenna structure is provided for transmitting and receiving electromagnetic signals in a communications device. The communications device includes circuitry for processing signals communicated to and from the antenna structure. The antenna structure includes a plurality of antenna ports operatively coupled to the circuitry and a plurality of antenna elements, each operatively coupled to a different one of the antenna ports. The antenna structure also includes one or more connecting elements electrically connecting the antenna elements such that electrical currents on one antenna element flow to a connected neighboring antenna element and generally bypass the antenna port coupled to the neighboring antenna element, and the electrical currents flowing through the one antenna element and the neighboring antenna element are generally equal in magnitude, such that an antenna mode excited by one antenna port is generally electrically isolated from a mode excited by another antenna port at a given desired signal frequency range and the antenna elements generate diverse antenna patterns.