

UWB Loop Antenna for In-Body Wireless Body Area Network

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Abstract:

A low profile printed magnetic loop antenna, implanted in the human tissues (i.e. skin, fat, and muscle) is presented in this paper. The antenna has been studied for the performance of a communication link between the implanted antenna and on-body or outside the body antenna. Ultra Wideband (UWB) system for communication from in-body implanted device to on-body or outside the body is one of the strong candidate for wireless medical applications. Propagation paths of Wireless Body Area Network (WBAN) can experience fading due to energy absorption, reflection, diffraction, and polarization mismatch. In order to minimize the propagation losses a well design antenna will be needed, however, at the same time antenna should be designed with respect to body tissues electrical properties. Antennas implanted in a human body must be designed with in-deep understanding of surrounding environment, keeping in mind that tissue environment is different from free space.