

This paper discusses the feasibility of a real-time active matching circuit (MC) for wireless power transfer applications, especially for biomedical systems. One prototype of low-cost real-time automatic MC, utilizing a variable circuit topology, including discrete passives and p-i-n diodes, has been implemented and the principle has been verified by measurements. One genetic algorithm was introduced to optimize the design over a wide range of impedances to match. As a result of preliminary operation verification tests, the proposed real-time MC system results in improving the transfer coefficient in the range of 10-16-cm coil separation distance a maximum of 3.2 dB automatically in about 64 ms. Similar performance improvement results were observed in additional tests under misaligned conditions, as well as for nonsymmetrical Tx-Rx coil configurations further verifying the potential applicability of the proposed system to practical biomedical devices.