In-the-Ear Circular-Shaped Balanced Inverted-A Antenna for Hearing Instruments

A novel in-the-ear antenna for hearing instruments that operates at 2.45 GHz is presented. The antenna is designed to obtain a polarization perpendicular to the surface of the head in order to optimize the ear-to-ear communication. The antenna consists of a bent dipole with a shorting pin used for impedance matching. It is self-resonant and well matched in the entire ISM band from 2.40 GHz to 2.48 GHz. The simulated and measured peak ear-to-ear path gain |S21| is ~74.5 dB and ~72.9 dB, respectively. The radiation pattern of the antenna is analyzed and the implications of the radiation pattern on the ear-to-ear communication are discussed.