

The Effect Study of Bended Microstrip Patch for Wearable Application

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Wearable electronic devices are becoming more and more popular in personal communication, computer systems. Like the normal microstrip patch antenna, which is being used as a representative antenna for mobile communication, wearable antenna has the advantages such as, low profile, small size and a relatively high gain. Moreover, unlike normal microstrip patch antenna, which is usually on top of the hard substrate, the most important feature of wearable antenna is that it is designed on top of a flexible woven conductive fabric, which can be easily sewn into the clothing or hats. Therefore, its substrate may not be planar any more. It is important to know how radiation patterns and resonance impedance effected by bending microstrip antenna. In present paper, we simulate differently bended curved wearable antenna for different part of human body. The design is based on numerical simulations using commercial software HFSS (Version 9.2.1, 2004 Ansoft Corporation) and EMPiCASSO (Version 3.30, 2004 EMAG Technologies, Inc). The frequency of the antenna is 2.5 GHz and the material of the dielectric substrate part is the common felt, which is commercially available material with thinness about 1 mm and dielectric constant about 1.43. The optimized dimension of patch antenna and feed line location is studied by EMPiCASSO. Differently bended curved wearable antennas are studied by HFSS: the shape for the antenna design to be worn in the lumbar region; the shape for the antenna design to be worn in the upper arm region. Radiation pattern and resonance impedance of differently bended wearable antennas are showed in comparison with corresponding planar microstrip antennas.