

## Bendable Microstrip Antenna with Partial Ground for Textile Related Applications

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### Abstract

*In this article, the bendable microstrip antenna with the partial ground plane is proposed. The anticipated antenna is made of jeans substrate and applicable in the frequency range 1.90 GHz to 6.81 GHz with a bandwidth of 112.74 %. There is comparison reference antenna and anticipated antenna. The proposed bendable wearable antenna is used in the textile related application.*

**Keywords:** Bendable Microstrip Antenna, CST software, Jeans Substrate

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### INTRODUCTION

Bendable wearable materials like conductive strands, fluid metallic mixes, and polymer in the paper [3-6] are generally utilized as a part of the current adaptable electronic gadgets. However, extra necessities are implemented in wearable applications. In this manner, these wearable applications require little size, lightweight, and low profile radio wires, which must present stable electrical properties, low power utilization, sensible impedance coordinate and attractive radiation. Characteristic elastic is an appealing exchange adaptable material which is biocompatible and offers high conductivity, low cost, simplicity to make and the most essential it is water/climate safe and condition amicable. The flexible materials like jeans, leather, and rubber have a low dielectric constant which lowers the weight of material and also improves the bandwidth. The dielectric constant of the material is proportional to the antenna size; hence with the textile materials compact antennas are easy to be made. The properties of the antenna such as the reflection coefficient, Voltage Standing Wave Ration, antenna gain and antenna radiation pattern are studied and analyzed for antenna designing [1-5].

The most of the existing antennas are not flexible and bendable and made up of a copper tape, identified as a printed antenna. In the case of the textile antenna, the copper tape is utilized to make the ground plane as well as

the radiating element. The copper tape has been pasted on both sides of the substrate to make radiating part and ground plane of the textile antenna. The handling of flexible materials for the development of microstrip antenna has been quick because of the recent tininess of wireless devices [6-8]. The far-field characteristics of the antenna are also an important function when as an application communication is established between body-worn sensors and larger units such as Personal Computer, Laptop, Mobile phones and Personal Digital Assistant [9-15].

The anticipated receiver antenna can be received RF power at resonant frequency 2.163 GHz. The bandwidth and directivity of the anticipated bendable antenna are far better than some existing antennas. The presented bendable textile antenna is applicable to transmit radio frequency in the frequency range 1.90 GHz to 6.81 GHz.

### DESIGN OF TEXTILE ANTENNA

Firstly we had designed two annular rings and both rings are interconnected by feed line. After that, we had inserted sickle slot to get broadband. Thus desired textile antenna was simulated in CST microwave studio 2010 environment. Table 1 contains the parameters and dimensions of the simulated textile antenna. The antenna designed and optimized with the CST microwave studio which is