

ABSTRACT

Wearable antenna in Wireless Body Area Networks (WBAN) communications has characteristics such as small size, light weight, and flexible. However, because the antenna placed very close of human body occurring several issues such as frequency shifting, impedantion mismatch, dan radiation effect that not desired and causing health problem. In this research, we propose a reflector based on Artificial Magnetic Conductor (AMC) to overcome those problems. Furthermore, by using AMC reflector will enhance the wearable antenna performances such as bandwidth, radiation, gain improvement and simultaneously maintain the compact structures of antenna.

The proposed AMC reflector designed with planar structure by flexible dielectric substrate RO3003 and composed by 3×3 periodic pathes with addition of multiple slots. Both AMC reflector dan wearable antena simulated using Electromagnetic Tolls Software. As the result in characterization, antena integrated by AMC reflector with spacing of 5 mm ($\sim \lambda/23$) has return loss of -16.49 dB at 2.45 GHz with bandwidth about 200 MHz and frequency range of 2.31 GHz – 2.51 GHz. This return loss and bandwidth performance smaller than by using antenna only, however when measured on-body dan bent conditions, wearable antenna integrated with AMC have a more robust of return loss performance. In addition, by using AMC reflector antenna's radiation can be more efficient by reducing the undesired backward radiation and overall antenna gain enhanced by 3.63 dBi.

Keywords : Wearable antenna, AMC, Health care, WBAN, Reflector