

ABSTRACT

Ultra-wideband (UWB) is a radio technology that can be used for the purposes of short-distance communication with high bandwidth. The bandwidth allocated for wireless communication starts from 3.1 GHz to 10.6 GHz. Bidirectional radiation patterns are needed because they are suitable for traffic lanes or long and narrow lane service areas. But along with the UWB operating bandwidth, there are several narrowband wireless services that bind several frequency bands in the UWB band such as WiMAX in the frequency of 3.3-3.6 GHz (IEEE 802.16), and WLAN systems at the frequency of 5.15-5.85 GHz (IEEE 802.11a).

To overcome this problem, one way is to use filters / notch to eliminate annoying narrowband. In this study, the dual-band notch UWB antennas have been design in the 3.3-3.6 GHz (WiMAX) and 5.15-5.85 GHz (WLAN) frequency bands with circular patches. The two structures of the notch are the provision of a J-shaped slot and EBG structure to realize band rejection characteristics at 3.5 GHz and at 5.5 GHz. The material used as a substrate is Rogers Duroid 5880 with a dielectric constant of 2.2 and a thickness of 1.57.

The antenna simulation results work along frequencies from 3.1 to 10.6 GHz with bidirectional radiation patterns at 3.1 GHz and 6.85 GHz except at 10.6 GHz with unidirectional radiation patterns. The simulation results of WiMAX bandwidth notch for $V_{SWR} > 2$ is 680 MHz with a frequency range of 2.92-3.6 GHz. For $V_{SWR} > 3$, bandwidth notch is 240 MHz with a frequency range of 3.33-3.57 GHz. The bandwidth notch WLAN simulation results for $V_{SWR} > 2$ is 820 MHz with a frequency range of 5.14-5.96 GHz. For $V_{SWR} > 3$, the bandwidth notch is 680 MHz with a frequency range of 5.28-5.96 GHz.

Keywords: UWB Antenna, Dual notch-band, J-shaped slot, EBG Structure