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Design of T-shaped UWB Antenna with Dual Band Rejection using Inverted U- and C-shaped Slots

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Abstract. An ultra-wideband antenna design is proposed in this paper based on simple and easy-fabricated rectangular patch antenna. The proposed antenna is inserted with two slots; inverted U- and C-shaped to minimize interference in WiMax and WLAN band. The antenna can afford a good range of operating frequency from 2.852 GHz to 12.176 GHz, which covers ultra-wideband frequency range set by Federal Communication Commission and in the same time be able to avoid undesired band.

Keywords: U Slot, C Slot, UWB, Dual Band, Notch Frequency.

1 Introduction

Ultra-wideband (UWB) antenna has been widely used in the field of military, remote sensing and radar technology [1] in these past years. UWB has a large operating bandwidth, good data transmission ratio, high resolution localization and ability to propagate through high permittivity medium even solid materials. These are the main factors lead to development UWB antenna for underwater communication. However, in this paper the design of compact antenna is proposed based on the modification of simple rectangular patch antenna to be used in free space. Different to free space, underwater environment needs consideration of conductivity, permittivity, propagation, wavelength and intrinsic impedance of water.

According to the Federal Communication Commission (FCC) on 2002, the UWB antenna frequency are covering from 3.1 GHz to 10.6 GHz [2]. Therefore, the proposed antenna should be able to operate in these such wide frequency and in the same time, it is necessary to eliminate IEEE 802.16 WiMax and IEEE 802.11a WLAN band which are allocated from 3.4 GHz to 3.69 GHz and from 5.15 GHz to 5.825 GHz, respectively [3].