

5.5 GHz NOTCHED ULTRA-WIDEBAND PRINTED MONOPOLE ANTENNA CHARACTERIZED BY ELECTROMAGNETIC BAND GAP STRUCTURES

AYMAN AYD R. SAAD¹, DEENA A. SALEM² & ELSAYED ESAM M. KHALED³

¹Elec. Eng. Dept., Minia University, Minia, Egypt

²Microstrip Dept., Electronics Research Institute, Giza, Egypt

³Elec. Eng. Dept., Assiut University, Assiut, Egypt

ABSTRACT

This paper presents a promising design of a band-notched printed monopole antenna for ultra-wide band (UWB) applications. By properly incorporating either a slotted patch electromagnetic band gap (spEBG) structure or a parasitic strip electromagnetic band gap (psEBG) structure in the antenna design a wide operating bandwidth from 3.7 to beyond 10.6 GHz for $VSWR \leq 2$ is obtained. Moreover a band-notched performance in the 5–6 GHz range is achieved. The proposed antenna is successfully designed and fabricated. The measured data of the proposed antenna show good agreement with the simulated results. Good impedance matching, high gain and high efficiency are obtained over the frequency band excluding the rejected band. The input admittance of the proposed antenna is modeled as a SPICE-compatible equivalent circuit using vector fitting technique, and the validity of the modeling method is verified.

KEYWORDS: Monopole Antenna; Ultra-Wideband (UWB); Band-Notch, EBG Structures; Circuit Modeling; Vector Fitting; SPICE Equivalent Circuit