

Correlation analysis on UWB MIMO tree-antenna orientations

Abstract

This research proposes a miniaturized antenna with a novel design for the ultra-wideband (UWB) multiple-input multiple-output (MIMO) system. The UWB-MIMO tree-antenna (UMTA) design consists of two symmetrical designs with minimum inter-element spacing of 53 mm on the same negative Taconic substrate. Three UMTA geometrical orientations, i.e., MIMO (0°-R), MIMO (180°-R), and MIMO (0°-U), were analyzed in terms of the reflection coefficient (< -10 dB), mutual coupling, and correlation coefficient. The UMTA is successfully achieved decrements of the correlation coefficient, with MIMO (0°-R) being less than -30 dB, MIMO (180°-R) being less than -40 dB, and MIMO (0°-U), being less than -35 dB. MIMO (180°-R), indicates the lowest correlation coefficient, which, in turn, enhances the diversity of the antenna. Measured and simulated results are presented. All designs and simulations are performed by Computer System Technology software.

Keywords

MIMO antenna; tree-antenna design; UWB antenna