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# An integrated 3G/Bluetooth and UWB antenna with a Frequency band-notched feature

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## Abstract:

In this article, the design and analysis of a compact slot antenna that covers 3G, Bluetooth, and the UWB bands with the standard band-notched function at 3.6 GHz are presented and investigated. A rectangular wide-slot etched off the ground plane is used to control the low operating frequency band and the impedance matching of the proposed antenna. A manipulated rectangular tuning stub is used to enhance and control the operating bandwidth at the high frequency band. The proposed antenna is fabricated and is successfully simulated and measured. The results indicate that the proposed antenna yields an impedance bandwidth of about 7.75 GHz (from 1.9 to 9.65 GHz) defined by  $VSWR \leq 2$  for UMTS (1.920–2.170 GHz)/Bluetooth (2.4–2.484 GHz)/3GPP (2.57–2.62 GHz), and UWB (3.1–9.65 GHz) applications with good radiation characteristics. To reduce interference between the UWB system and the WiMAX system (3.3–3.9 GHz), a U-shaped slot is employed in the microstrip feeding line to create notched band of 3.2–4.0 GHz. Furthermore, a mathematical circuit model compatible with time-domain circuit simulators, which is based on a vector fitting technique, is also illustrated to investigate the proposed antenna characteristics.

## Keywords:

slot antenna, 3G, UMTS, 3GPP, Bluetooth, UWB, circuit modeling, vector fitting

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