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DESIGN AND DEVELOPMENT OF UWB PATCH ANTENNA WITH VARIABLE BAND NOTCHED USING RING-SHAPED SLITS

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Abstract

ASEAN countries have recently proposed the frequency band (4.5–5.5) GHz for fifth generation (5G) cellular communication, which necessitates the creation of an ultra-wideband (UWB) antenna to accommodate the band-notched function. To describe the compact shape of a UWB antenna in the context of 5G application, this article has introduced a variable notched resonant characteristic at 5G lower band . A tuning fork radiating patch with a simple defected ground plane structure was used to create the UWB antenna . In order to create the band-notched criteria, a pair of ring-shaped slits (RSS) has been applied to the ground plane. This antenna has achieved a huge bandwidth from 2.9 GHz to 11 GHz and an extremely low VSWR less than 2. It appears that the antenna covers all frequencies except for notched frequency bands at lower 5G band (4.5–5.5) GHz. The antenna has

been archived a peak gain of 5 dBi for UWB , but the notched frequency band produces less than -1 dBi. The notched-band can be shifted gradually in response to changes in the different positions of RSS's along the vertical axis, resulting capability to design for variable band-notched characteristics. The preliminary design was presented in [19]. The complete design is fabricated and tested and presented in this paper. The proposed antenna is small, with a surface area of 45×34 mm^2, making it ideal for 5G lower band application. © 2022 Little Lion Scientific.

Author keywords

5G lower band ; Microstrip patch antenna ; RSS; UWB ; variable band-notched

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