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Telkomnika (Telecommunication Computing Electronics and Control) Open Access
Volume 19, Issue 2, April 2021, Pages 357-363

Design of UWB microstrip patch antenna with variable band notched characteristics (Article) (Open Access)

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Abstract

View references (25)

Recently lower frequency band 4.5 - 5.5 GHz is proposed by the ASEAN countries for 5G cellular application and therefore, it is essential of designing an ultra-wideband (UWB) antenna for the particular band-notched characteristics. In this article, a compact tuning fork shape ultra-wideband (UWB) patch antenna with a variable band-notched characteristic has been proposed for 5G cellular application. The UWB antenna has been achieved by using a tuning fork shape with a simple partial ground plane. A pair of ring shape slits (RSS) on the ground plane has been added to achieve the band-notched characteristic. The proposed antenna has achieved a large -10 dB bandwidth of 7.8 GHz (2.9 - 11 GHz) and the VSWR value is less than 2 for the entire bandwidth excepted for notched frequency bands of lower 5G bands (4.5 - 5.5 GHz). Moreover, the antenna has a peak radiation efficiency of more than 87% for UWB and less than 27% for the notched frequency band. The notched-band is shifted with the change in the position of RSS's within the vertical axis and thus, the variable band-notched characteristics have been achieved. Besides, the proposed antenna is compact with the dimension of 45 × 34 mm2 that makes it suitable for the lower band of 5G application.

SciVal Topic Prominence

Topic: Monopole Antennas | Ultra-Wideband (UWB) | Coplanar Waveguides

Prominence percentile: 96.804

Author keywords

Notched-band | Patch antenna | Tuning fork | UWB

Funding details

Funding sponsor	Funding number	Acronym
	RIGS16-065-0229	
International Islamic University Malaysia		IIUM

Funding text

This project is partially supported by International Islamic University Malaysia Research Initiative Grant Scheme No. RIGS16-065-0229.

ISSN: 16936930
DOI: 10.12928/TELKOMNIKA.v19i2.18147
Source Type: Journal
Document Type: Article
Original language: English
Publisher: Universitas Ahmad Dahlan