(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :10/05/2021

(21) Application No.202141021100 A
(43) Publication Date : 11/06/2021

(54) Title of the invention : DESIGN AND FABRICATION OF MICROSTRIP PATCH ANTENNA FOR WIRELESS 5G APPLICATIONS

(51) International classification	:H01Q0009040000, H01Q0001380000, H01Q0009060000, H01Q0001500000, H01Q0001220000
(31) Priority Document No	:NA
(32) Priority Date	:NA
(33) Name of priority country	:NA
(86) International Application No	:NA
Filing Date	:NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number	:NA
Filing Date	:NA
(62) Divisional to Application Number	:NA
Filing Date	:NA

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(57) Abstract :
Advanced high speed wireless communication has attracted the researchers to focus on designing antennas which can provide optimal radiation. In the current era, 5G wireless communication has occupied the network world as its features are better compared to 4G wireless communication. In this invention we focus on designing circular microstrip patch antenna operating at a resonant frequency of 28.5 GHz with microstrip feed line such that it can be utilized for high speed 5G applications using simulation software CST Microwave Studio. We have selected RT/Duroid 5880 as the substrate material where the substrate height is of 0.65mm with a dielectric constant value of er = 2.2 and a loss tangent of 1x10-3. This design is fabricated and analyzed which is found to be very efficient in providing optimal radiation of almost 100%. This antenna design is reliable for advanced high speed networks such as 5G applications with high gain of 10 dB, good return loss of -32.86 dB and an increased bandwidth of 1.636 GHz.

No. of Pages : 12 No. of Claims : 6

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Patent Search

Invention Title	DESIGN AND FABRICATION OF MICROSTRIP PATCH ANTENNA FOR WIRELESS 5G APPLICATIONS
Publication Number	24/2021
Publication Date	11/06/2021
Publication Type	INA
Application Number	202141021100
Application Filing Date	10/05/2021
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	ELECTRONICS
Classification (IPC)	H01Q0009040000, H01Q0001380000, H01Q0009060000, H01Q0001500000, H01Q0001220000

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Abstract:

Advanced high speed wireless communication has attracted the researchers to focus on designing antennas which can provide optimal radiation. In the current era, 5G wi communication has occupied the network world as its features are better compared to 4G wireless communication. In this invention we focus on designing circular micros patch antenna operating at a resonant frequency of 28.5 GHz with microstrip feed line such that it can be utilized for high speed 5G applications using simulation software Microwave Studio. We have selected RT/Duroid 5880 as the substrate material where the substrate height is of 0.65mm with a dielectric constant value of er = 2.2 and a lo tangent of 1x10-3. This design is fabricated and analyzed which is found to be very efficient in providing optimal radiation of almost 100%. This antenna design is reliable f advanced high speed networks such as 5G applications with high gain of 10 dB, good return loss of -32.86 dB and an increased bandwidth of 1.636 GHz.

Complete Specification

Claims:1. This invention proposes a microstrip circular patch antenna which is designed to operate at a resonance frequency of 28.5 GHz.
2. Microstrip feed line is utilized for high speed 5G applications simulated using the software CST Microwave Studio.
3. Higher gain of 10 dB is achieved with good signal strength with increased bandwidth of 1.63 GHz for high speed data transmission.
4. Return loss of -32.86 dB is achieved for voltage standing wave ratio of 1.037 for radio frequency power.
5. Excellent antenna radiation efficiency of almost 100% is achieved.
6. Data traffic due to many smart phone users can be handled easily.

, Description:• The proposed microstrip circular patch antenna provides beam width for maximum power radiation which is basically angle of aperture.
• Good resolution capability is shown by the antenna for comparing two sources which is equal to half of the first null beam width which is related to antenna gain of proposed antenna, obtained as 79.58° angular separation.
• Radiation Efficiency of antenna which transmits and receives RF signal is another useful need for high speed wireless communication.
• It indicates the ratio of total amount of power radiation of an antenna to that of total amount of power received by the antenna.
• Input power is radiated efficiently for the high radiation antenna efficiency, whereas input power gets dissipated for low radiation antenna efficiency generally due t internal losses such as metal conduction, dielectric losses and magnetic losses in the antenna system.
• In our antenna system, high antenna radiation efficiency is achieved of almost 100% necessary for 5G data applications.
• Distribution of current in the antenna indicates the efficiency of radiation

View Application Status

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Page last updated on: 26/06/2019