

A DISSERTATION ON
**DESIGN OF COMPACT PLANNAR MULTI-BAND
INTERNAL ANTENNA FOR MOBILE PHONE**

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CERTIFICATE

This is to certify that the dissertation title *“Design of Compact planar Multi-Band Internal Antenna For Mobile Phone”* is the authentic work of **Mr. Pankaj Sarvaiya** under my guidance and supervision in the partial fulfillment of requirement towards the degree of Master of Technology in *Microwave and Optical Communication*, jointly run by the Department of Electronics and Communication Engineering and Department of Applied Physics at *Delhi Technological University, New Delhi*. To the best of my knowledge, the matter embodied in the thesis has not been submitted to any other University / Institute for the award of any other degree.

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DECLARATION

I hereby declare that all the information in these documents has been obtained and presented in accordance with academic rules and ethical conduct. It is being submitted for the degree of Master of Technology in Microwave and Optical Communication at Delhi Technological University. It has not been submitted before for any degree or examination in any other university.

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ABSTRACT

In recent last years, wireless communication devices like Mobile Phones, Bluetooth technology etc have been developed widely and rapidly. And their external appearances are paying more attention to users like small size, portable, handy and with in small size users get all application and functions which is available in previous model and also extra functions. So to make the size smaller, external antenna has been replaced by internal antenna. Now the upcoming trend for the mobile phone is that more components need to be installed inside the mobile phone to make the mobile phone more powerful but the size remains small. Unfortunately the space in a mobile phone is limited and we cannot compromise with the features of mobile phone because of the advancement of new technology. So internal antenna becomes more and more limited. In order to provide better functionality, most mobile antenna also require to operate on a wide band and support the following five communication standards: GSM 850(824-894MHz), GSM 900(880-960MHz), DCS(1710-1880MHz), PCS(1850-1990MHz),and UMTS(1920-2170MHz). In addition to support these standard bands, it also required to support an additional band of 2.4-2.484GHz known as wireless wide area networks (WWAN) in order to access the internet. Recent studies show that the Meander line antenna is an interesting class of resonating antenna and they have been study in order to reduce the size of the radiating element called antenna. In meander line antenna the wire is continuously folded in order to reduce the length and to operate on different resonant frequency. The meander line antenna offers a low cost and can be design by using cheaper microstrip board that is FR-4 board. This thesis covers the steps by which multi-band antenna is design and provide the low return loss, good directivity, antenna gain, power radiation for the following bands.

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