5.5 GHz Printed Antenna for Screen Mirroring

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***Abstract*—**Screen Mirroring can work with a Smart Television or Television with a wireless Hub. Many recent Smartphone models support the screen mirroring, but the older phone may require a custom tool to link with the Television. Smart TV also allow the user to install and Run more advanced application based on specific platform. Device connection is easy, but there is lag on the TV's side. Also one of advantage is External Antenna increase the range .This paper present Design and Analysis for dongle that's plugs into Television's HDMI port. The antenna offers small size, good impedance bandwidth and high gain.

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I. INTRODUCTION

Screen mirroring is the process of displaying content fro one screen onto another screen. These screens can be on t.. same device, such as multiple monitors or displays on a computer, or adaptors designed to help one device display onto another device. Mirroring can be used for business and educational purposes, by allowing many viewers to observe a presentation or educational software run from a larger, primary display. The presenter controls the software from his own main screen. Screen mirroring also has entertainment purposes, allowing users to display audio and video from the Internet on a television at home. When using a regular television, attach a wireless hub using a HDMI cable. Double check that the hub identifies the television before attempting to connect the phone. With some wireless hubs, you need to restart the hub after identifying the television before connecting. The legacy TV is now being replaced by IP-connected Smart TV which offers more advanced computing ability and connectivity.
Screen mirroring and media streaming both refer to using a computer to share content to a TV or projector. However, the difference between screen mirroring and media streaming can often be misunderstood. We get this question a lot and want to clear up the confusion between the two types of technology.

Screen mirroring involves sending what's on your computer screen to a TV or projector via a cable or wireless connection.

Media streaming refers to receiving online content via a digital media player to TV via a wireless connection.

Casting is another word for media streaming, but is a branded term used in reference to Google Chromecast.

This paper present Design of printed Monopole Antenna. Printed Monopole antenna offers benefits of low complexity, cost effectiveness, high flexibility, light weight and small size. They also have advantages of ease of design, fabrication and integration to the overall system. They come in different type and have varying structures but most of geometries are variation of basic rectangular, circular and triangular patch design.

In this paper Printed Monopole antenna will be designed for Screen mirroring Application.

Fig.1 Connection Diagram of Screen Mirroring.

Mirroring is of two types:

Wired Screen Mirroring
For example, how HDMI cables work is that they digitally transfer the information (0s and 1s) from PC to TV. Let's break down the 3 steps that make this happen

A. *Detecting a connection*
This step detects a connection between your computer and TV. When you connect the cable, your computer's graphic card detects a second screen.

B. *Sharing information*
Since there are many different screens and resolutions, your computer needs to know some information before it can start a connection with a second screen. This second step tells your computer what the audio and video settings of your TV are, so your computer can display the information properly.

This is also called E.D.I.D. (Extended Display Identification Data).

C. *Mirroring starts*

After a connection is detected and the computer knows your TV's settings, the computer sends its information to your TV. What you see on your TV screen is exactly what you see on your computer screen.

Wireless Screen Mirroring

Wireless HDMI

Wireless HDMI refers to the life mirroring of your PC screen to TV using WiFi.

The Airtame device, for example, uses a WiFi connection to mirror your computer screen. How Airtame works is that it uses PC software to capture your computer screen. It does this by taking screen shots at a rate of 30 images per second.

The computer then packages this data so that it can be sent via a WiFi connection to the Airtame device, which is plugged into the TV or monitor via an HDMI port.

The Airtame device unpacks this information and displays it to the TV. It's a kind of magic when you consider that this all happens in real-time as you are moving around on your computer.

II.ANTENNA DESIGN

To estimate the lower band-edge frequency of printed monopole antennas, the standard formulation given for cylindrical monopole antenna can be used with suitable modification. The equation was worked out for the planar monopole antennas. If is the height of the planar monopole antenna in cm, which is taken same as that of an equivalent cylindrical monopole, and in cm is the effective radius of the equivalent cylindrical monopole antenna, which is determined by equating area of the planar and cylindrical monopole antennas, then the lower band-edge frequency is given

$$f_L = \frac{c}{\lambda} = \frac{7.2}{(L+r+p)} \text{ GHz}$$

where is the length of the 50 Ω feed line in cm.Unlike the planar disc monopole antennas, the printed configuration has dielectric layer on one side of the monopole. This dielectric material increases the effective dimensions of the monopole leading to reduction in the lower band-edge frequency. This is also confirmed by simulation studies. Hence, more appropriate equation for the lower band-edge frequency is given as

$$f_L = \frac{c}{\lambda} = \frac{7.2}{(L+r+p)\times k} \text{ GHz}$$

The lower band edge frequency, instead of resonance frequency, is an important parameter of printed monopole antenna

Following parametric study are carried out for the PRMA to increase the bandwidth keeping the fL same.

To increase the BW by increasing the width of the rectangular patch and keeping height constant to maintain the same lower band edge frequency.

Shifting of feed point from center (offset single feed) to improve input matching..

Dual and triple feed configurations for achieving bandwidth enhancement; the concept used for planar monopole antennas. These multi point symmetric feeds, connected to the lower edge of square monopole (planar) antenna, excite more uniform surface current on the planar monopole antenna

III PARAMETRIC STUDY

A. *Patch Width Variation*

If the width W is small , the PRMA behaves as a thin strip monopole antenna, which is equivalent to thin wire monopole. In Smith chart observation, impedance variation around and in between various loops, which indicates different modes of rectangular patch, is large. As W increases, the impedance variation around and in between various modes reduces, bringing loops closer to each other yielding increased BW.

B. *Offset Feed*

The bottom contour of the patch, the feed length and the ground plane, three together form the impedance transformer for the PRMA Thus, to obtain improved input match,the value of the offset X is varied from 0 to 7.5mm and corresponding. The maximum BW of 2.62GHz is achieved at 7.5mm. Beyond 7.5mm, the input matching degrades leading to decrease in BW.

IV.CONCLUSION

In this paper,Prametric and Antenna design study have been presented on Printed Monopole Antenna to overcome the lag which is on the TV side.It will help to make the video nice and smooth .Userful's new mirroring feature makes this easy and it saves enormous amounts , bandwidth and other costs by copying that single source to multiple displays.

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