

# Gi-Fi Wireless Technology

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**Abstract:-Gi-Fi (Gigabit Fidelity) or gigabit wireless technology which is used for wireless communication at a data rate of more than one billion bits per second. Gi-Fi technology provides some advantages over Wi-Fi which is also wireless technology. It is most important wireless technology that enhances our personal environment, either work or private by means of networking or variety of personal devices within space and outside world. It plays main role for high speed large files transfers within seconds. Gi-Fi also allows the transfer of wireless audio and video files within range of 10 meters. Initially wireless technology includes infrared which was a very slow technology further inventions were done to make wireless technology a better for communication and the invention of Bluetooth , Wimax moved wireless communication. Gi-Fi consist of chip which has the facility to deliver short range multi gigabit data transfer in local environment and compared to other technologies in the market it is ten times faster. Gi-Fi has the data transfer speed upto 5 Gbps within short range of 10 meters. It operates on the 60 GHz frequency band. Gi-Fi allows transfer of large videos , audio files, data files within few seconds.**

## I. INTRODUCTION

Communication is one of the essential part of science that has always been point for exchanging information among parties at location actually apart wireless technology permits services such as long range communication. For many years cables ruled the world, optical fibers played a dominant role for its higher bit rates & faster transmission .Due to its drawback in installation caused a great difficulty that forced to step into the need for wireless which can cover 9-10 meters. Next, wifi having coverage area 91 meters has brought revolutionary solution to the problem faced by Bluetooth technology. To overcome all the present difficulties a new technology that transfers data and video information at faster rate, we move on with new technology namely Gi-Fi. Gi-Fi provides some advantages over wireless technologies such as fast information rate in Gbps range communication.

Gi-Fi or Gigabit Fidelity is the world's first transceiver integrated on single chip operation at 60GHz on the

complementary Metal Oxide Semiconductor (CMOS) process that allows wireless audio & video data transfer upto 5 Gbps within range of 10 Meters. To transmit data wirelessly over short distances , it utilizes 5mm square chip & 1mm wide antenna & consumes only 2mw of power. This technology is 10 times faster than Wi-fi & it is expected revolution networking in offices & homes by implementing high speed wireless environments. Gi-Fi allows full length high definition movie to be transferred between two system in seconds.This technology provides high broadband access high speed transfer of data within second & low cost one.

The main & important component of Gi-Fi system is its subscriber station which is available to several access points. It supports standard of IEEE 802.15.3C which uses small antenna at the subscriber station. For the communication among different computer devices, which includes telephones & PDA, it supports millimeter wave wireless PAN network .

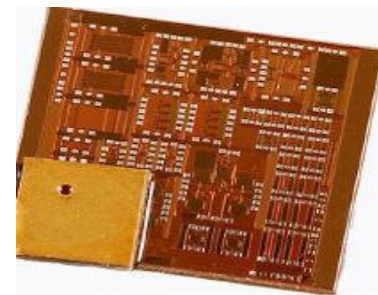


Fig. 1: Gi-Fi Chip

## II. HISTORY OF GIFI

Melbourne university researchers have achieved upto 5Gbps data transfers rates on a wireless chip. This is a lot faster than current Wifi speeds. The Gi-Fi chips is only 5mm in size and use current CMOS technology .The Gi-Fi chip uses only a tiny one mm wide antenna and less than two watts of power. Gi-Fi uses the 60 GHz “millimeter wave” spectrum to transmit the data from one part to the another part. The Gi-Fi uses the short range wireless technology would potentially more than Wifi. The transfer speeds combined with the constantly increased storage capacities of small handheld

devices. The world first Gi-Fi wireless network chip developed at Australia pear federal technology incubator has entered its commercialization phase.

### III. ARCHITECTURE OF GI-FI

The core component of Gi-Fi system is the subscriber station which available to several access points. It supports standard of IEEE 802.15.3C. The wireless span is computer network used for communication among computer devices close to one person. An 802.15.3C based system often uses small antenna at the subscriber station. The antenna is mounted on the roof. It support line of sight operation.

### IV. FEATURES OF GI-FI

#### A. Capacity of High Speed Data Transfer

The data transfer rate of Gigabit wireless technology is in Gigabit per second. Speed of Gi-Fi is 5 Gbps which is 10 times faster the data transfer of existing technologies. Providing higher data transfer rate is the main invention of Gi-Fi. An entire HD movie could be transmitted to mobile phone in few seconds.

#### B. Small in Size

The size of the GIFI chip is 5\*5 mm & can be placed in different devices such as mobile phones. The chip has a tiny 1mm antenna & uses 60GHz “ millimeter wave spectrum ”.

#### C. Low Power Consumption

As the large amount of information transfer it utilizes milliwatts of power only. Chip of GIFI uses s tiny 1mm wide antenna & it has less than 2 milliwatts of power consumption that in compare to the current technologies is very less.

#### D. Cost Effective

GIFI is based on an open, international standard, mass adoption of the standard & the use of low cost, mass produced chipset will drive cost down & the resultant integrated wireless transceiver chip will drive cost down & the resultant integrated wireless transceiver chip which transfers data at high speed.

### V. WORKING OF GI-FI

Here we will be use TDD for both transmission and receiving .The data files are converted from IF to RF 60GHz range by using 2 mixers. The incoming RF signal is first down converted to IF signal centered at 5GHz and then to normal data ranges , here we will use heterodyne construction for this process to avoid leakages due to direct conversion. Due to availability of 7GHz spectrum the total data will be transferred within second.

### VI. TDD(Time Division Duplex)

Time Division Duplex is the application of time division multiplexing to separate outwards and return signals . It emulates full duplex communication over half duplex communication link. TDD has strong advantage in the case where asymmetry of the uplink and downlink data speed is variable. As uplink traffic increases, more channel capacity can dynamically be allocated to that and as it shrinks it can be taken away.

### VII. APPLICATION OF GI-FI

- This technology can be successfully used in wireless pan network, inter-vehicle communication system, AD hoc information distribution with point to point network extension media access control (MAC), imaging & other application.
- GIFI technology also can be used in broadband video signal transaction system in sport stadium & multimedia wave video signal transaction system. The technology could also be used for beaming full HD video in real time & could be used by notebooks.
- GIFI technology has many attractive features that make it suitable for use in many places & device .GIFI technology offering reduced the chip size and consumption can be used to send & receive large amount of data in variety of applications. This technologies fast data synchronization rates enable the rapid transfer of video.
- GIFI technology is able to transfer gigabits of data within seconds & therefore it can be used for huge data file transmission & it is expected that this chipset replaces HDMI cables & could develop wireless home & office of future.

### VIII. ADVANTAGES OF GI-FI

#### A. Removing Cables

For many years cables ruled the world optical fibers played a dominant role for its higher bit rates and faster transmission , but the installation of cables caused a greater difficulty and thus led to wireless access. Gi-Fi technology removes need for cables to connect consumer electronic devices and all the devices in the range of 10 meters can be connected in order to transmit the data wirelessly.

#### B. Small in Size

The size of Gi-Fi is 5\*5 milimeter and can be placed in different devices such as mobile phones . The chip has a tiny 1 millimeter antenna and uses 60 GHz millimeter wave spectrum.

### *C. Faster Data Transmission*

Gi-Fi is wireless transmission system which is ten times faster than Wifi and its chip delivers in an indoor multi gigabit data transfer in an indoor environment . It will allow transfer of audio and video data upto 5 gigabit per second.

### *D. Low Power Consumption*

As the large amount of information transfer, it utilizes miliwatts of power only. Power consumption of the present technology such as Wifi and Bluetooth are 5 miliwatts and 10 miliwatts but chip of Gi-Fi uses a tiny one millimeter wide.

## **IX. CONCLUSION**

Within five years , we expect GIFI to be the dominant technology for wireless networking .By that time it will be fully mobile, as well as providing low cost , high broadband access , with very high speed large files swapped within second which will develop wireless home and office of future . GIFI can bring wireless broadband to the enterprise in an entirely new way. The comparison is performed between shows that these features along with some other benefit that make, it suitable to replace existing wireless technologies. It removes cables that for many years ruled over the world and provides high speed data transfer rate. GIFI technology has much number of applications such as smart phones, wireless pan network media access control and multimedia video signals transmission system.

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