

GIFI next generation wireless technology

Tejal Sanjay Shambharkar, Dr.Dinesh Vithalrao Rojatkar
Student, Asst.Professor
Dept. of Electronics and Telecommunication
Government College of Engineering,Chandrapur,Maharastra.

Abstract- Today's world is changing drastically. With the changing world the Wireless technology improvement has become follower in today's modern life. One of the biggest improvements made on wireless technology was inventing a new wireless technology (GI-FI). GI-FI stand for gigabit wireless fidelity, it's a wireless transmission technology; which is ten time faster than other wireless technology. Its chip delivers short-range multi-gigabit data transfer in an indoor environment. In today's world fastest transmission is must which is achieved by this GI-FI. Gigabit wireless is the world's first transceiver integrated on a single chip that operates at 60 GHz frequency band. GIFI has data transfer speed up to 5Gbps .GI-FI technology was invented by Stan Skafidis. It is manufactured using (CMOS) technology. In this paper, the brief introduction and evolution of GI-FI is explained. It also helps to know architecture and working of GI-FI. The readers will get brief knowledge about its features and advantages. The best part of GI-FI technology is its power consumption. It requires only 2watts of power for its operation with antenna 1mm. The evolution of GI-FI came into existence due to the need of higher data transfer rate ad lower power consumption.

Keywords: wifi, Gifi abd Bluetooth.

INTRODUCTION

Melbourne University researchers have invented 5Gbps data transfer rates on a wireless chip. This is a faster than any other technology with a speed up to 5Gbps within a radius of 10 meters. . Gigabit wireless is the world's first transceiver integrated on a single chip that operates at 60 GHz frequency band. GIFI has data transfer speed up to 5Gbps. The world's first GI-FI wireless network chip where invented at Australia. WIFI and Bluetooth have capture our attention, as there is no development in wireless technology which transfer data at faster rate as video data information transfer take lots of time. It offers some advantage over Wi-Fi which is faster information rate in Gbps, less power consumption, low cost. GI-FI is developed on integrated transceiver chip. So GI-FI is considered to be challenger to the WI-FI. GI-FI allows transfer of our favorite video information in just a second. Within five years, we expect GI-FI to be the dominant technology for wireless networking. The size of the GI-FI chip is 5×5 millimeter and can be placed in different devices such as mobile phones, as it is shown in the figure.

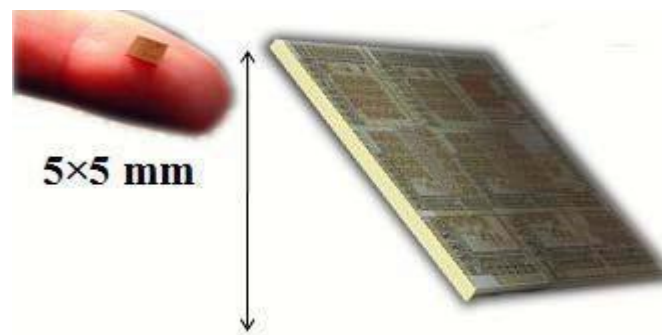


Fig. 1 GI-FI chip



Fig. 2 GI-FI chip in mobile device

WHY GIFI IS BEST TECHNOLOGY

There are lots of reasons to use GI-FI instead of other wireless technology, these are as given below:

- A) In GI-FI technology chip is used which works on 50GHz frequency and has a speed of 5Gbps, which is much greater than recently used wireless technology such as Wi-Fi and Bluetooth.
- B) In GIFI mixing and signal filtering is used. Which would keep the signal strong versus the large range, but in slower speed as Wi-Fi.
- C) The GIFI uses short-range wireless technology and would potentially be a competitor or more than likely a replacement for Wi-Fi, and things like Bluetooth might want to look out as well.
- D) GIFI technology consumes less power as compared to Wi-Fi and Bluetooth.
- E) The reason for pushing into GIFI technology is because of slow rate, high power consumption, low range of frequency operations of earlier technologies i.e. Bluetooth and Wi-Fi. See the comparisons and features of those two technologies.

Characteristics	GIFI	WIFI	BLUETOOTH
Data Transfer Rate	5Gbps	11Mbps	800Kbps
Range	10meter	100meter	10meter
Specification authority	NICTA	IEEE, WECA	Bluetooth SIG
Development start date	2004	1990	1998
Power consumption	2MW	10MW	5MW
Frequency	57-64GHz	2.4GHz	2.4GHz
Primary device	Mobile phones, Home	Notebook Computers, Desktop	Mobile phones, PDAs, Consumer,

	Devices, PDAs, Consumer, Electronics Office Industrial automation Devices	Computers, Servers	Electronics Office Industrial automation Devices
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Table1: Comparison Between Gifi, Wifi and Bluetooth

WHY 60Hz

In GIFI we use millimeter range antenna, which will works at 60GHz frequency which is without lining band, because of this we achieve large signaling rate energy propagation in the 60 GHz band. This has unique characteristics that make possible many other benefits such as greater immunity to co-channel interference, high security, and frequency re-use. This is because of high oxygen absorption at 60 GHz (10-15 dB/Km). This absorption attenuates.60 GHz signals over distance, so that signals cannot travel far beyond their planned recipient. For this reason, 60GHz is a very good choice for covert communications.

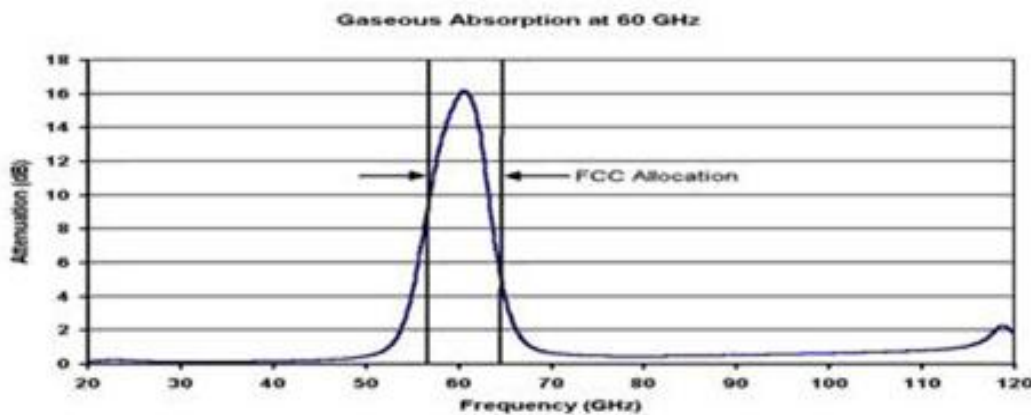


Fig. oxygen Attenuation vs. Frequency

LITERATURE SURVEY

1) World survey:

Australia is the pioneer in development of GI-FI technology. Melbourne University researchers have invented 5Gbps data transfer rates on a wireless chip. This is a very fast than our current Wi-Fi speeds. The world's first GI-FI wireless network chip developed at Australia's peak federal technology incubator has entered its commercialization phase. The NICTA (National ICT Australia Limited) GI-FI research team successfully invented 60GHz transmission technology. Ross and John in 2007 proposed a model that MIMO increased capacity 10 times or more and improves radiating energy efficiency of order of 100 times.

2) India survey

S. Dheeraj and S. Gopichand in 2002 proposed a model in which they invented a technology which has gain flexibility of infrastructure, reduce capacity expenditure, gain advantages over competitors and to solve business problem. Goutam S Shetty in 2006 proposed that wireless dual band router and wireless dual band USB adapter are based on upcoming WI-FI technology, which is new wireless technology in 802.11ac family. Sachin abhyankar in 2009 proposed a model which show WI-FI which resolve all problems which occur in Bluetooth, limitation of data transfer rate and range . Ramiiaz in 2011proposed that radio link can operate in indoor environment with considerably small power consumption.

NETWORK EVOLUTION

Communication or data transfer technology is mainly classified into two groups which are 1) Wired technology and 2) Wireless technology. Initially we come in contact with wired technology but there are lots of difficulties arrived during installing of wired technology hence wireless technology was invented. This wireless technology leads to GI-FI technology. Below diagram will give the network evolution.

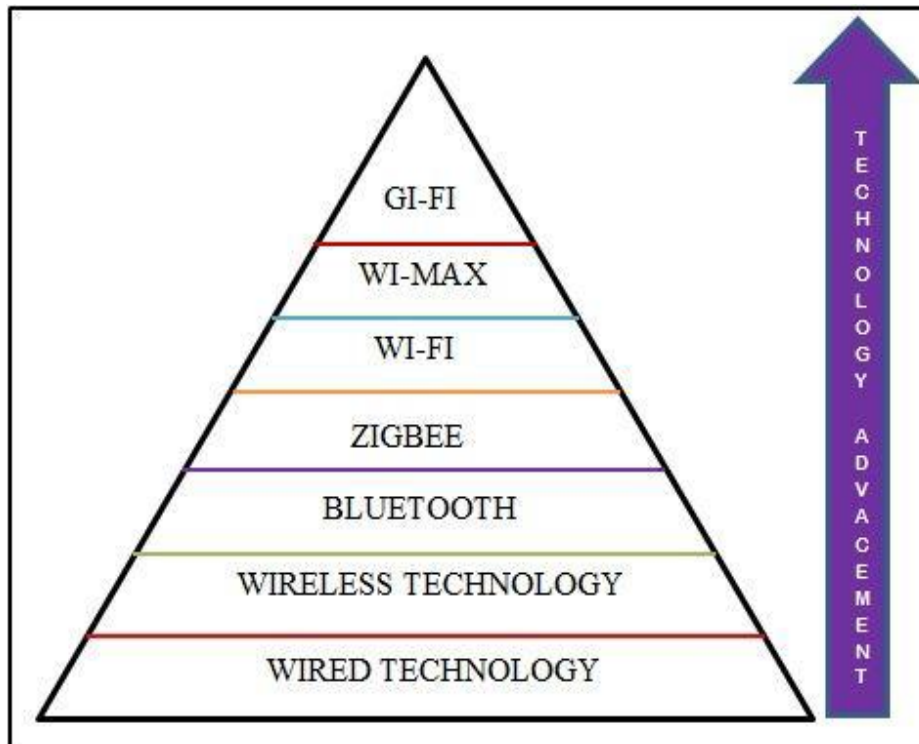


Fig. 3 Network Evolution

WORKING PRINCIPLE USED IN GI-FI

In the working of GI-FI we come across time division duplex for both transmission and receiving purpose. In which data file initially converted from IF range to RF60 GHz range by using 2 mixers and next we will fed this to power amplifier, which is connected to multi meter wave antenna. Incoming RF signal is converted to IF signal centered at 5 GHz and then to normal data range, for that we use heterodyne construction to avoid leakage due to direct conversion and hence due to this total data is transfer within second

ADVANTAGES OF GIFI

- 1) **Low power consumption:** Even though GI-FI transfer large amount of information but it consumes very less power in the range of few mille-watts only. GI-FI uses very little one-millimeter-wide antenna and it has less than 2mili watts of power consumption that in compare to the current technologies is very less.
- 2) **High security:** the IEEE 802.15.3C provides more security. Point-to-point wireless systems operating at 60 GHz have been used for many years by the intelligence community for high security communications and by the military for satellite-to satellite communications. The combined effects of O₂ absorption and narrow beam spread result in high security and low interference.
- 3) **Cost effectiveness:** The use of low-cost, mass produced chipsets will drive costs down dramatically. The resultant integrated wireless transceiver chip which transfers data at very high speed with low power and at low price i.e. 230 RS only, which is very less As compare to present systems.

4) Small size: The size of the GI-FI chip is 5×5 millimetre and can be placed in different devices such as mobile phones. The chip has a tiny 1mm antenna and uses the 60GHz.

5) Quick development: Compared with the deployment of wired solutions, WI-MAX requires little or no external plant construction. Once the antenna and equipment are installed and powered, GI-FI is ready for service. In most cases, deployment of GI-FI can be completed in a matter of minutes compared with hours for other solutions.

6) Profitable Chip: The chip in GI-FI would likely cost about \$10 or less to build a small design would allow cell phones and other small devices to add the technology without significantly drive up the price, according to the company. As go on development the price will be decreased.

7) Faster Data Transmission: GI-FI is a wireless transmission system which is ten times faster than Wi-Fi and its chip delivers short-range multi-gigabit data transfer in an indoor environment. It will allow wireless transfer of audio and video data up to 5 gigabits per second.

CONCLUSION

Thus the wireless transmission of information at very fast speed is achieved. GI-FI allows wireless transfer of audio- video data up to 5Gbps, ten times the current maximum wireless transfer rate, at one-tenth of the cost, usually within a range of 10 meters that operates at 60GHz on the CMOS process, Some other benefits such as no frequency interference, Low power consumption and high security make it suitable to replace existing wireless technologies for the implementation in different transmission systems. As now GI-FI has been a developing technology on which still an advanced research is going on its application.

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