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**Research report**

**Discussion of LIFI technology**

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**INTRODUCTORY SUMMARY**

As for a communication technology, the heart of this technology is a new generation of high-brightness light-emitting diodes. LIFI, a new revolutionary technology, based on LED can satisfied it. They can be switched on and off very quickly, which gives nice opportunities for transmitting data. It is possible to encode data in the light by varying the rate at which the LEDs flicker on an off to give different strings of 1s and 0s. The modulation is so fast that the human eye doesn’t notice. This may solve issues such as the shortage of radio-frequency bandwidth and also allow internet where traditional radio based wireless isn’t allowed such as aircraft or hospitals.

**EASY TO CONSTRUCT**

Nowadays, lighting equipment and technology are mature and diffusive, people can use the electric equipment circuit they has been paved long time ago, to accessing the network only need to implant a chip, it can save a lot of time and money. Furthermore, it wouldn’t bring new pollution such as construction litters so on and so forth.

**LOW ENERGY CONSUMPTION**

Light is commonplace to everyone and we surrounded by light almost all the time. Therefore, using light as the intermediary of wireless communication is a kind of healthy and desirable direction. Because of the theory of LIFI, it can reduce the energy consumption. They do not need to cost additional energy consumption of base station, thus, LIFI can be regarded as a green technology.

**HIGHER BANDWIDTH AND DATA RATE**

The visible light spectrum’s bandwidth is 10000 times larger than the bandwidth of the electromagnetic wave it means using LIFI can bring more information. What’s more, according to reports, laboratory testing the maximum speed of LIFI is 1Gbps. This is a desirable news for people who need for high speed, people can enjoy the experience of high speed whenever and wherever possible.

**SECURITY**

With regard to the electromagnetic wave, it can penetrate the object easily, from a security point of view, this may be intercepted and disclosure of information. But for LIFI, the visible light cannot penetrate the wall but transmit along the line of sight. The data only to transmit the direction you want, in a word, it is more security.

**DISTANCE PROBLEM**

LED’s transmission distance is limited. The intensity of light may influence by many facts. If the intensity of light is not enough, LIFI can’t work well. As a matter of fact, even no interferences, the transmission distance of visible light is shorter than electromagnetic wave.

**CORNER POCKETS**

On account of the spread way, LIFI has the corner pocket when it works. It cannot penetrate the wall or other barriers, so that LIFI may not use in somewhere complex.

**THE DEVELOPMENT AND APPLICATION**

At present, through the improvement of intelligent mobile phone on the LED, LIFI is the fastest path to the mass consumer market. Samsung, Siemens and other electronics giants did not miss this feast. Samsung in 2010 began using the LCD flat panel display test for visible light communications with LED backlight, Siemens by white LED visible light communication in 2010, to achieve the communication speed of up to 500Mbps.

**CONCLUSION**

LIFI is a new technology, this new technology let people see the advantage to industry and the promotion, and in fact there is a long way to go, such as the development of optical fiber, the theory turn to industrialization costs almost half a century. But we can also maintain an optimistic attitude to new technology, after all, it is obviously that the advantages which LIFI contains cannot be overlook. Because it is a transition technology rather than a revolutionary technology. LIFI has very good prospect, it has depend on its high generalization.

Sincerely

Huang Qiaochu