A Design and Research of Transceiver Circuit to High Speed POF Communication System

胡國昌、鍾翼能

E-mail: 9419691@mail.dyu.edu.tw

ABSTRACT

In recent years the Internet is developed very quickly. For delivering the multi-media information, the amount of data becomes very huge. Facing the need of this data transmission bandwidth and rate, it is imperative to set up fiber-optic network in communication system. In current structure, due to the expensive price, the glass optical fiber is mainly applied to the long distance communication such as the intercontinental sea cables, and the framework on the lands. On the other hand, the plastic optical fiber has the low cost, built easy and safeguard convenient advantage, so fit application in home network of the short distance, to replace the traditional network wire as coaxial cable, twist pair etc. In light of the development, we make use of LED, laser driver, PIN photodiode, trans-impedance amplifier, and limiting amplifier to design the high speed POF optical transceiver, and test its transmission performance, to probe into the problem under the high data rate.

Keywords : optical connector、optical transceiver、home network

Table of Contents

REFERENCES

[1]James Cirillo, "High Speed Plastic Networks (HSPN): A New Technology for Today ’ s Application", IEEE AES Systems Magazine, pp. 10~11, October 1996.

[2]IEEE Computer Society, "P1394b Draft Standard for a High Performance Series Bus (High Speed Supplement)", IEEE P1394b Draft 1.3.3, Nov 16, 2001.

[3]Y. Koike et al., IEEE Journal of Lightwave Technology, vol. 13, No. 7, pp. 1475~1489, 1995.

[4]Michihiko Sakurai, Kenji Watanabe, Kimitake Utsunomiya, etc., "A Miniature Optical Transceiver for High Speed POF Optical Link System" IEEE, pp. 116, 1998.

[5]許致遠，"塑膠光纖傳輸模組產業之競爭力分析"，國立交通大學，國際經貿學程碩士班，碩士論文，pp. 1，民國92年。

[6]賴耿陽，"通訊光纖應用技術－塑膠光纖篇"，復漢出版社，pp. 1，1999年。

[7]N. Saitoh, "Plastic optical fibres and their application to passive components and various data link", POF, pp. 10~14, 1992.
[8]T. Kaino, "Polymers for optoelectronics", Polymer Engineering and Science , pp. 1200~1214, 1989.
[9]C. Koeppen, R. F. Shi, W. D. Chen, A. F. Garito, "Properties of plastic optical fibers", Joural Opt. Soc. AM. B. 152, pp. 727~739,1998.
[10]戴建，"塑膠光纖在光通訊上的技術發展與應用"，化工資訊，卷13、第7期、pp. 22，2000年。
[11]Sony and Sharp Corporation, "OP i.LINK Specification", Version 2.0 , October 1, 2001.
[12]MAXIM Corporation, "NRZ Bandwidth HF-Cutoff v.s. SNR", Application Note of MAXIM, 2001.
[13]Joseph C. Palais, "Fiber Optic Communications", pp. 312, Prentice Hall, 2000.
[14]Dennis Derickson, "Fiber Optic Test and Measurement", pp. 291, Prentice Hall, 1998.
[15]MAXIM Corporation, "Jitter in Digital Communication System Part. 1 and Part 2", Application Note of MAXIM, 2001.
[16]MAXIM Corporation, "A Brief Introduction to Jitter in Optical Receivers", Application Note of MAXIM, 2000.
[17]Tektronix Corporation, "DWDM Performance and Conformance Testing Primer", Application Note of Tektronix, 2001.
[18]Joseph C. Palais, "Fiber Optic Communications", pp. 298, Prentice Hall, 2000.
[19]黃素真，"光纖技術手冊"，全華科技出版社，pp. 8-11 ~ 8-16，2003年。
[20]Joseph C. Palais, "Fiber Optic Communications", pp. 146, Prentice Hall, 2000.
[21]林螢光，"光電子學－原理、元件與應用"，全華科技出版社，pp. 8-32，1999年。
[22]Donald A. Neamen, "Semiconductor Physics and Devices", pp. 648~649, McGRAW-HILL, 2003.
[23]林螢光，"光電子學－原理、元件與應用"，全華科技出版社，pp. 8-37 ~ 8-38，1999年。
[24]Joseph C. Palais, "Fiber Optic Communications", pp. 148, Prentice Hall, 2000.
[25]賴柏淵，"光纖通訊與網路技術"，全華科技出版社，pp. 3-38，2004年。
[26]MAXIM Corporation, "Introduction to LVDS, PECL, and CML", Application Note of MAXIM, 2000.
[27]Joseph C. Palais, "Fiber Optic Communications", pp. 186, Prentice Hall, 2000.
[28]林螢光，"光電子學－原理、元件與應用"，全華科技出版社，pp. 7-17，1999年。
[29]S.O. Kasap, "Optoelectronics and Photonics: Principles and Practices", pp. 224, Prentice Hall, 2001.
[30]龔祖德，"光纖通訊技術"，全華科技出版社，pp. 113，1997年。
[31]Joseph C. Palais, "Fiber Optic Communications", pp. 182 ~ 183, Prentice Hall, 2000.