

# Integration of the Microstrip Antenna and Wireless LAN System

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## ABSTRACT

The wireless network products are getting mature, thus a standard regulation has been set up for producer. Meantime, the relevant technology is steadier than when such products were just developed. The speed problems have also been overcome gradually. The entering threshold has been lowered down; therefore consumers have more purchasing choices. Due to such figures market competition, how to upgrade products' capacities and to make products more convenient for consumers have become the goals of all leading brands on the market. Under the trend of getting light, thin, short and small, antenna, no matter they are built-in plug-in, or built outdoors for general public or outdoor users, is a topic to be discussed. This article will discuss the application of Microstrip Antenna in Wireless Network Card, and its application in Wireless catch point. The application of Wireless Network System (including 48V Power over Ethernet), the testing and stimulation in Microstrip Antenna and practical implication in Wireless Network Card, will also be discussed in the product of using all Wireless products of unify and to develop into advantage of a even area.

Keywords : Microstrip Antenna ; Wireless LAN ; POE Wireless System

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## REFERENCES

[1] 90年度通訊科技教育改進計畫 "無線區域網路實習教材" [2] IEEE Std 802.11b-1999, "IEEE standard for information technology-telecommunications and information exchange between systems-local and metropolitan area networks -specific requirement," IEEE Std 802.11b-1999/ Cor1 -2001,7 Nov.2001 [3] Agilent Technologies, 安捷倫電子量測技術研討會,2002 [4] S. Maci and G. Biffi Gentili, "Dual-frequency patch antennas," Antennas and Propagation Magazine, vol. 39, pp. 13-20, 1997 [5] Kin-Lu Wong, Compact and Broadband Microstrip Antennas, 2002 by John andWiley & Sons, Inc. [6] Chih-Ming Su, Hong-Twu Chen and Kin-Lu Wong, "Printed dual-band dipoleantenna with U-slotted arms for 2.4/5.2 GHz WLAN operation," Electron. Lett.vol. 38, pp. 1308-1309, 2002. [7] Kin-Lu Wong, Planar Antennas for Wireless Communications, 2003 by John andWiley & Sons, Inc [8] C. Soras, M. Karaboikis, G. Tsachtsiris, and V. Makios, "Analysis and design of an inverted-F antenna printed on a PCMCIA card for the 2.4GHz ISMband", IEEE Antennas and Propagation Magazine, vol. 44, no. 1, pp. 37-43,2002.

- [9] E. Leevine, G. Malamud, S. Shtrikman and D. Treve, " A study of microstrip antenna with the feed network, " IEEE Trans. Antenna Propagat. , vol. 37, pp.426-434, 1989.
- [10] Constantine A. Balanis, Antenna Theory Analysis and Design, 1982, 1997 by John and Wiley & Sons, Inc.
- [11] P. Bhartia, K.V. S. Rao, R.S. Tomar, Millimeter-wave Microstrip and Printed Circuit Antennas, 1991 by Boston [12] K.C. Gupta and Abdelaziz Benalla, Microstrip Antenna Design, 1988 [13] 洪俊杰, 應用於無線區域網路天線之研究, 碩士論文, 大葉大學電機學系碩士班, 2003
- [14] J. A. Crawford, Card-based diversity antenna structure for wireless communications, U.S. Patent No.6456245 B1 (2002).
- [15] G. P. Karakoussis, A. I. Kostaridis, C. G. Biniaris and D. I. Kaklamani, " A dual-band inverted-F antenna printed on a PC card for the ISM and UNNIbands, " Wireless ommunications and Networking, 2003. WCNC 2003. 2003 IEEE vol. 1, pp. 16-20 2003 ,pp.88-92 vol. 1.
- [16] 翁金輅, 平面天線理論與設計, 國立中山大學電機系工程學系, 2002 [17] Geozondas Vilnius , Antenna Test Area Instruction Manual, 2002
- [18] 白光弘, " 天線原理及應用 " , ISBN 957-9509-85-9, July, 1992 [19] W. L. Stutzman and G. A. Thiele, " Antenna Theory and Design " , John Wiley & Sons, 1981, U.S.A.
- [20] K. L. Wong, F. S. Chang and T. W. Chiou, Low-cost broadband circularly polarized probe-fed patch antenna for WLAN base station, 2002 IEEE Antennas Propagat. Soc. Int. Symp., vol. 2, pp. 526-529, San Antonio, USA.
- [21] 謝士煒, 5.2GHz無線區域網路射頻收發機及頻率合成器之電路設計、組製與整合測試, 碩士論文, 中正大學電機學系碩士班, 2002 [22] 吳宗和, 5.2GHz無線區域網路之射頻模組模擬、組製與整合測試, 碩士論文, 中正大學電機學系碩士班, 2002 [23] 羅培彰, 印刷式多頻天線及分集天線之設計, 碩士論文, 交通大學電信工程學系碩士班, 2003