

雙頻帶操作印刷天線的小型化研究

陳泰儒、胡大湘

E-mail: 9607728@mail.dyu.edu.tw

摘要

在本文中，我們提出以弧狀饋入結構雙頻操作印刷槽孔天線設計，此天線設計主要結構特徵是在圓環型槽孔中植入一蜿蜒金屬微帶搭配弧狀饋入結構方式，使其激發三個共振頻帶而第一個頻帶低於未加入設計結構之參考天線的第一個共振頻帶，而所提出天線設計也可縮小尺寸為傳統圓環形印刷槽孔天線（參考天線）的0.53倍。同時在中央金屬微片底部植入一對凹槽（Notch）也可使後二個激發模態的共振頻帶相互靠近而結合為一較寬的操作頻帶。

關鍵詞：印刷槽孔天線，雙頻，縮小化

目錄

目錄 封面內頁 簽名頁 授權書	iii 中文摘要
iv 英文摘要	v 謹謝
vi 目錄	vii 圖目錄
ix 表目錄	x 第一章 緒論 1.1 前言
1.1.2 研究動機	4 1.3 內容提要
5 第二章 槽孔天線文獻回顧 2.1 概述	6 2.2 雙頻帶操作印刷槽孔天線文獻回顧
7 第三章 小型化雙頻帶操作圓環形印刷槽孔弧狀饋入天線設計 3.1 概述	12 3.2 天線結構
14 3.3 天線返回損失特性的實驗結果與討論	17 3.4 小型化雙頻帶操作圓環形印刷槽孔弧狀饋入天線輻射特性實驗與結果探討
32 3.5 本章討論	33 第四章 結論
參 考 文 獻	38

參考文獻

- [1] 柯正學，“應用於無線區域網路之低剖面槽孔天線研究設計，”國防大學中正理工學院電子工程研究所,2003.
- [2] 許勝欽，“雙頻操作印刷天線小型化之研究，”大葉大學電信研究所,2006.
- [3] IEEE Standard 802.11, “Information Technology- telecommunications And Information exchange Between Systems- Local And Metropolitan Area Networks-specific Requirements -part 11: Wireless Lan Medium Access Control (MAC) And Physical Layer (PHY) Specifications,” Nov. 1997.
- [4] IEEE Standard 802.11a, “Information Technology telecommunications and information exchange between systems-Local and metropolitan area networks - specific requirements. Part 11: wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: high-speed physical layer in the 5 GHz Band,” 1999.
- [5] IEEE Standard 802.11b, “Information Technology- Telecommunications And Information Exchange Between Systems-Local And Metropolitan Area Networks- Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) And Physical Layer (PHY) Specifications: Higher-speed Physical Layer Extension In The 2.4 GHz Band,” 1999.
- [6] ETSI Standard TS 101 475, “Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Physical (PHY) layer,” Apr. 2000.
- [7] IEEE Standard 802.11g, “Information Technology- telecommunications and information exchange between systems-local and metropolitan area networks- specific requirements Part II: wireless LAN medium access control (MAC) and physical layer (PHY) specifications; Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band,” 2003.
- [8] IEEE Standard 802.15.1, “Information Technology- Telecommunications and information exchange between systems-Local and metropolitan area networks- Specific requirements Part 15.1: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Wireless Personal Area Networks (WPANs),” 2002.
- [9] IEEE Standard 802.15.4, “Information Technology- Telecommunications and information exchange between systems-local and metropolitan area networks specific requirements part 15.4: wireless medium access control (MAC) and physical layer (PHY) specifications for low-rate wireless personal area networks (LR-WPANs),” 2003.
- [10] Lin, S. Y. and Wong, K. L., “A Dual-Frequency Microstrip-Line-Fed Printed Slot Antenna,” Microwave Opt. Technol. Lett., Vol. 28, pp.

373-375, July, 2001.

- [11] Chen, J. S., " Multi-Frequency Characteristics of Annular-Ring Slot Antennas, " *Microwave Opt. Technol. Lett.*, Vol. 38, pp. 506-511, Sep., 2003.
- [12] Liu, J. C., Zeng, B. H., Wu, C. Y., and Chang, D. C., " Double-Ring Slot Antenna with Tree-Shaped Coupling Strip for WLAN 2.4/5-GHz Dual-Band Applications, " *Microwave Opt. Technol. Lett.*, Vol. 47, pp. 374-379, Nov., 2005.
- [13] P. Rakluea, and N. Ananttrasirichai , " A Double-Band Right Angle Microstrip Slot Antenna , " *IEEE Opt. Technol. Lett.*, Vol. 47, pp. 374-379, Nov., 2006.
- [14] J. Tao, C. H. Cheng, and H. B. Zhu , " Compact Dual-Band Slot Antenna for WLAN Applications, " *Microwave Opt. Technol. Lett.*, / Vol. 49, No. 5, May 2007.
- [15] Hooman Tehrani, Member, IEEE, and Kai Chang, Fellow, IEEE, " Multifrequency Operation of Microstrip-Fed Slot-Ring Antennas on Thin Low-Dielectric Permittivity Substrates, " *IEEE Trans. Antennas propagat.* vol. 50, NO. 9, september 2002 [16] Yong-Woong Jang, " A Circular Microstrip-Fed Single-Layer Single-Slot Antenna for Multi-Band Mobil Communications, " *Microwave Opt. Technol. Lett.*, Vol. 37, No. 1, April 5 2003.
- [17] JoongHan Yoon, GyeY Teak Jeong, and Kyung Sup Kwak, " Fabrication and Measurement of Triangular-Slot Antenna for Triple-Band (2.4/5.2/5.8 GHz) Antenna with Rectangular Tuning Stub, " *Microwave Opt. Technol. Lett.*, Vol. 49, No. 8, August 2007 [18] Jeun-Wen Wu , " 2.4/5-GHz Dual-Band Triangular Slot Antenna with Compact Operation, " *Microwave Opt. Technol. Lett.*, / Vol. 45, No. 1, April 5 2005
- [19] Hai-Ming Hsiao, Jeun-Wen Wu, Yau-Der Wang, Jui-Han Lu, and Shun-Hsyung, " Chang Novel Dual-Broadband Rectangular-Slot Antenna for 2.4/5-GHZ Wireless Communication, " *Microwave Opt. Technol. Lett.*, / Vol. 46, No. 3, August 5 2005.