# Design of Dual-Mode Microstrip Filters


## 洪誠志、許崇宜

E-mail: 9707899@mail.dyu.edu.tw



**ABSTRACT**

In the thesis, a miniature dual-mode microstrip bandpass filter with a center frequency of 2.5 GHz is designed by appropriately bending a circular ring inward. Next, proposed in this thesis is a dual-mode diplexer whose two paths are centered at 2.43 and 2.76 GHz, with their minimum insertion losses being 1.96 and 1.92 dB, respectively. Each of he two rings of the diplexer has been bent into triangular shape to save the circuit area.



Keywords : dual-mode filter ; diplexer


**Table of Contents**



**REFERENCES**


[1] I. Wolff, “ Microstrip Bandpass Filters Using Degenerate Modes of a Microstrip Ring, ” Electron. Letters, vol. 8, pp. 163-164, June 1972.

[2] M. Matsuo, Hi. Yabuki, and M. Makimoto, “ Dual-Mode Stepped-Impedance Ring Resonator for Bandpass Filter Applications, ” IEEE Transactions on Microwave Theory and Techniques, vol. 49, pp. 1235-1240, July 2001.

[3] J. S. Hong and, M. J. Lancaster, “ Bandpass Characteristics of New Dual-Mode Microsrtip Square Loop Resonator, ” Electronics Letters, vol. 31, pp. 891-92, 1995.

[4] A. Gorur, “ Description of Coupling Between Degenerate Modes of a Dual-Mode Microstrip Loop Resonator Using a Novel Perturbation Arrangement and Its Dual-Mode Bandpass Filter Applications, ” IEEE Transactions on Microwave Theory and Techniques, vol. 52, pp. 671 - 677, February 2004.

[5] A. Gorur, “ Realization of A Dual-Mode Bandpass Filter Exhibiting Either a Chebyshev or an Elliptic Characteristic by Changing Perturbation ’ s Size, ” IEEE Microwave and Wireless Components Letters, vol. 14, pp. 118-120, March 2004.

[6] A. Gorur, and C. Karpuz, “ Miniature Dual-Mode Microstrip Filters, ” IEEE Microwave and Wireless Components Letters, vol. 17, pp. 37-39, January 2007.

[7] T. W. Soong, J. C. Liu, C. H. Shie, and C. Y. Wu, “ Modified Dual-Mode Double-Ring Resonators for Wide Band-Pass Filter Design, ” IEE Proc.-Microw. Antennas Propag, vol. 152, pp. 245-250, August 2005.

[8] S. T. Lu, P. C. Deng, J. C. Liu, and T. I. Wu, “ On the Relationship Among Dual-Mode Double-Ring and Double Slot-Ring Resonators for Wide Band-Pass Filter Design, ” Microwave and Optical Technology Letters, vol. 50, pp. 117-122, January 2008.

[9] X. W. Dai, C. H. Liang, and Z. Chen, “ Novel Dual-Mode Dual-Band Bandpass Filter Using Nested Microstrip Meander-Loop Resonators, ” Microwave and Optical Technology Letters, vol. 50, pp. 836-838, March 2008.

[10] R. Wu, and S. Amari, “ New Triangular Microstrip Loop Resonators for Bandpass Dual-Mode Filter Applications, ” IEEE Microwave Symposium Digest, pp. 941-944, June 2005.

[11] Y. C. Chiou, J. T. Kuo, and J. Shiuan, “ Miniaturized Dual-Mode Ring Resonator Bandpass Filter with Microstrip-to-CPW

Broadside-Coupled Structure, ” IEEE Microwave and Wireless Components Letters, vol. 18, pp. 97-99, February 2008.
[12] M. H. Awida, A. M. E. Safwat, and H. E. Hennawy, “ Dual-Mode Microstrip Bandpass Filter Using Ring of Arrows Resonator, ” Electronics Letters, vol. 41, pp. 1335-1336, November 2005.
[13] B. Strassner, and K. Cheng, “ Wide-Band Low-Loss High-Isolation Microstrip Periodic-stub Diplexer for Multiple-Frequency Applications, ” IEEE Trans. Microwave Theory Tech., vol. 49, pp. 1818-1820, October 2001.
[14] C. M Tsai, S. Y. Lee, C. C. Chuang and C. C. Tsai, “ A Folded Coupled-Line Structure and Its Application to Filter and Diplexer Design, ” IEEE MTT-S International Microwave Symposium Digest, pp. 1927-1930, June 2002.