缺陷接地結構之精確參數萃取與改善微帶濾波器設計之應用

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摘 要

本論文使用缺陷接地結構 (Defected ground structures)設計低通濾波器。先萃取出缺陷接地結構 (DGS)等效電路的元件值，再放入濾波器之設計。設計濾波器時，為了增加效益或是縮小電路的面積，會在接地面加入缺陷接地結構(DGS)，但傳統的設計並未考慮到高頻時微帶線殘斷(Stub)上的寄生效應(Parasitic effect)，而殘斷(Stub)上面的效應，會影響到我們設計的精確性。雖然就單獨的殘斷影響可以忽略，但以整體架構的參數特性，傳統的設計方式是不夠的，故提出修正的方法。

關鍵詞 : 缺陷接地結構、低通濾波器、寄生效應

目錄

參考文獻

[1] D. Ahn, J. S. Park, C. S. Kim, J. Kim, Y. Qian, andT. Itoh, “ A design of the Novel microstrip defected ground structure, ” IEEE Trans. Microw. Theory Tech .,vol.49, no.1, pp. 86 – 93, Jan. 2001 [2] D. Woo and T. Lee, “ Suppression of harmonics in Wilkinson power divider using dual-band rejection by asymmetric DGS, ” IEEE Trans.Micro. Theory Tech., vol.53, no. 6, pp.2139 – 2144, Jun. 2005.

[3] Jun-Seok Park, Jun-Sik Yun, and Dal Ahn, ” A Design of the Novel Coupled – Line Bandpass Filter Using Defected Ground Structure with wide Stopband Performance, ” IEEE Trans.Microwave Theory Thec, vol. 50,no.9, pp.2307 – 2043.2002.

[4] R. Zhang and R. R. Mansour, Waterloo, Ontario, “ A Novel Lowpass Microstrip Filter Using Metal-Loaded Slots in the Ground Plane, ” IEEE MTT-D Digest Int. Dig, pp.417-420, 2002.

[5] Hai-Wen Liu, Zheng-Fan Li, Xiao-Wei Sun, and Jun-Fa Mao, ” An Improver 1 – D Periodic Defected GroundS tructure for Microstrip Line, ” IEEE Microwave and Wireless Components Letters, vol. 14, no. 4, April.2004.

[6] Wei-Tzong Liu, Chung-Hao Tsai, Tzu-Wei Han, and Tzong-Lin Wu, “ An Embedded Common-Mode Suppression Filter for GHz Differential Signals Using Periodic Defected Ground Plane, ” IEEE Microwave and Wireless Components Letters, vol. 18, no. 4, April 2008.

[7] Dong-Jin Jung and Kai Chang, “ Low-Pass design through the accurate of Electromagnetic-Bandgap geometry on the ground plane ” IEEE Tran. Microw. Theory Tech., vol.57, no.7, pp.1798 – 1805. July. 2009.

[8] D.M. Pozar, Microwave and RF Wireless Systems, John Wiley, New York, 2001.

[9] Q. Xue, K. M. Shum, and C. H. Chan, “ Novel 1-D microstrip PBG cell, ” IEEE Microw. Guided Wave Lett., vol.10, no.10, pp. 403 – 405. Oct. 2000.

[10] C. S. Kim, J. S. Park, D. Ahn, and J.B. Lim, “ A novel 1-D periodic defected ground structure for planar circuits, ” IEEE Microw. Guided Waven Lwtt., vol.10 no.4, pp. 131 – 133, Apr. 2000.

[11] D.Ahn, J. S. Park, C. s. Kim, J. Kim, Y. Qian, and T. Itoh, “ A design of the low-paa filter using the novel microstrip defected ground structure, ” IEEE Tran. Microw. Theory Tech., vol.49, no.1,pp.86 – 93, Jan. 2001.