{tag} {/tag}
IJCA Proceedings on National Conference on Advances in Communication and Computing

NCACC 2015 - Number 1

Year of Publication: 2015

Authors:
Deepika A. Agrawal

Jagadish B. Jadhav

{bibtex}ncacc3009.bib{/bibtex}

Abstract

A new co-design approach is used to synthesize and design the new printed Bandpass Filtering Antenna. For the purpose of miniaturization and enhancing the overall performance of the circuit, a multi-function module is designed. It performs filtering and radiating, simultaneously with the help of co-design approach. The parallel half wavelength coupled microstrip lines and inverted-L antenna is used for synthesizing the bandpass filtering antenna. The inverted-L antenna acts as a last resonator and provides load impedance of the bandpass filter. The equivalent circuit components of inverted-L antenna are acquired by comparing with the simulation results and then used for synthesis of Filtering Antenna. A complete design

methodology is then described after the synthesis process. Here, third-order Chebyshev bandpass filter with center frequency 2. 45 GHz and 0. 1 equal-ripple response is designed as an example. The designed structure is compact and provides good design accuracy.

References

- Chao-Tang Chuang, Shyh-Jong Chung," Synthesis and Design of a New Printed Filtering Antenna", IEEE Trans. Antennas Propag. , vol. 59, no. 3, pp. 1036-1042, March 2011.
- H. An, B. K. J. C. Nauwelaers, and A. R. V. D. Capelle,"Broadband microstrip antenna design with the simplified real frequency technique", IEEE Trans. Antennas Propag. , vol. 42, no. 2, pp. 129?136, Feb. 1994
- B. Froppier, Y. Mahe, E. M. Cruz, and S. Toutain,"Integration of a filtering function in an electromagnetic horn", in Proc. 33th Eur. Microw. Conf. , pp. 939?942, 2002
- F. Queudet, B. Froppier, Y. Mahe, and S. Toutain, "Study of a leaky waveguide for the design of filtering antennas", in Proc. 33th Eur. Microw. Conf. , pp. 943?946, 2003
- F. Queudet, I. Pele, B. Froppier, Y. Mahe, and S. Toutain, "Integration of pass-band filters in patch antennas", in Proc. 32th Eur. Microw. Conf. , pp. 685?688, 2002
- N. Yang, C. Caloz, and K. Wu,"Co-designed CPS UWB filter-antenna system", in Proc. IEEE AP-S Int. Symp. , pp. 1433?1436, Jun. 2007
- T. L. Nadan, J. P. Coupez, S. Toutain, and C. Person, "Optimization and miniaturization of a filter/antenna multifunction module using a composite ceramic-foam substrate", in IEEE MTT-S Int. Microw. Symp.
- A. Abbaspour-Tamijani, J. Rizk, and G. Rebeiz, "Integration of filters and microstrip antennas", in Proc. IEEE AP-S Int. Symp. , pp. 874?877, Jun. 2002
- Chao-Tang Chuang, Shyh-Jong Chung, "New Printed Filtering Antenna with Selectivity", in Proc. 39th Eur. Microw. Conf. , October 2009.
- Mitsuo Makimoto,Sadahiko Yamashita, "Bandpass Filters Using Parallel Coupled Stripline Stepped Impedance Resonators", IEEE Trans. Microwave theory and Techniques. , vol. 28, no. 12, pp. 129?136, Dec. 1980.
- Chin-Kai Lin and Shyh-Jong Chung, "A Compact Filtering Microstrip Antenna With Quasi-Elliptic Broadside Antenna Gain Response?, IEEE Antennas And Wireless Propagation Letters, Vol. 10, 2011
- Chin-Kai Lin and Shyh-Jong Chung, "A Filtering Microstrip Antenna Array?, IEEE Transactions On Microwave Theory And Techniques, Vol. 59, No. 11, November 2011
- D. M. Pozar, Microwave Engineering, 3rd ed. New York: Wiley, 2005, ch. 8.
- G. L. Matthaei, L. Young, and E. M. T. Jones, Microwave Filters: Impedance-Matching Networks and Coupling Structures. New York: McGraw-Hill, 1964.
- J. G. Hong and M. J. Lancaster, Microstrip Filters for RF/Microwave Applications. New York: Wiley, 2001
- C. A. Balanis, Antenna Theory and Design, 3rd ed. New York: Wiley 2010

- R. E. Collin, Foundations for Microwave Engineering, 2nd ed. New York: Wiley,2009

Index Terms

Computer Science Wireless Communications

Keywords

Filtering Antenna Filter Synthesis Co-design Approach Inverted- L Antenna.