

Accepted Manuscript



Regular paper

Compact Dual-Band Bandstop Filter Using Folded Resonator

Xueliang Min, Hou Zhang

PII: S1434-8411(17)31384-5
DOI: <https://doi.org/10.1016/j.aeue.2017.10.027>
Reference: AEUE 52105

To appear in: *International Journal of Electronics and Communications*

Received Date: 4 June 2017
Accepted Date: 17 October 2017

Please cite this article as: X. Min, H. Zhang, Compact Dual-Band Bandstop Filter Using Folded Resonator, *International Journal of Electronics and Communications* (2017), doi: <https://doi.org/10.1016/j.aeue.2017.10.027>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Compact Dual-Band Bandstop Filter Using Folded Resonator

Xueliang Min*, Hou Zhang

Airforce Engineering University, Xi'an, Shaanxi Province 710051, China

Abstract. A compact dual-band bandstop filter composed of main transmission line and four folded resonators is presented. Through analyzing the structure of folded resonator, it is found that the main transmission line connected with two proposed folded resonators exhibits the characteristic of band-rejection. Simulated results show that the center frequency of stopband is 2.72GHz. Then, through adding another pair of folded resonator; a compact dual-band bandstop filter is achieved. Simulated results demonstrate that transmission poles are induced to have better selectivity. Additionally, in order to explain the mechanism of proposed structure, the *LC* equivalent circuit, analysis of parametric effect and surface current distributions are given. Due to the folded structure, the filter dimensions are reduced and the adjustable stopband is another feature. By virtue of optimization, proposed structure is fabricated. Measured results agree well with the simulation.

Keywords

Dual-band; folded resonator; bandstop filter

1. Introduction

As the development of microwave communications, the demand for high performance filters is increasing. Many design approaches for filters are researched in recent years [1-9]. In the wireless microwave communications systems, bandstop filter is essential for filtering the unwanted signals. In the design of bandstop filter, microstrip structure [10-22] is usually adopted. Especially, stepped-impedance resonator (SIR), defected ground structure (DGS), dual composite right/left-handed transmission line (D-CRLH-TL) and defected microstrip structure (DMS) are widely utilized. In literature [10], the filter is designed as two gap capacitor coupled to two coupled composite right-left handed transmission lines. In literature [11], a dual-band bandstop filter adopting defected stepped impedance resonators embedded on transmission line is presented. Results show that two transmission zeros are induced. In addition, inner T-shaped defected microstrip structure [12] and double hairpin-shaped defected ground structure [13] are utilized in the design of bandstop filter. A stepped impedance dual mode resonator is used in [14], resulting in a more compact size. In [15], by using open/shorted coupled lines, a novel dual-band bandstop filter is proposed. Compact bandstop filters are designed based on stepped impedance resonator and dual-mode complementary split-ring resonator in [16] and [18]. In [20], a novel dual-band small-size bandstop filter is proposed by using a novel coupled-line stub and in [22], the folded, symmetric resonators are also used in the design of bandstop filter.

In this letter, a compact dual-band bandstop filter is proposed by inducing two pairs of folded resonators. First, the structure of one pair of folded resonators is analyzed. Simulated results show that one stopband is generated. Then, a dual-band bandstop filter is achieved by adopting two pairs of folded resonators. Simulated results demonstrate that it has better selectivity owing to the transmission poles.

Download English Version:

<https://daneshyari.com/en/article/6879759>

Download Persian Version:

<https://daneshyari.com/article/6879759>

[Daneshyari.com](https://daneshyari.com)