

**Ali J. Salim**

Microwave Research Group,  
Department of Electrical  
Engineering, University of  
Technology, Baghdad, Iraq.  
[alijsalim@yahoo.com](mailto:alijsalim@yahoo.com)

**Aya N. Alkhafaji**

Microwave Research Group,  
Department of Electrical  
Engineering, University of  
Technology, Baghdad, Iraq.  
[a.n.1991@yahoo.com](mailto:a.n.1991@yahoo.com)

**Mushtaq A. Alqaisy**

College of Engineering,  
Al Iraqia University,  
College of Engineering  
Baghdad, Iraq.  
[mush.alqaisy@gmail.com](mailto:mush.alqaisy@gmail.com)

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## A Compact Dual-Band BPF Based on Open Loop Resonator for Satellite Communication Applications

**Abstract-** In this paper, a new filter is constructed by inserting two slots in the form of rectangular open loop resonator with folded ends. The insertion of these slots has successfully led to the compact size and the dual bandwidth behavior. The overall filter dimensions are  $16 \times 12 \text{ mm}^2$ , which correspond to  $0.61\lambda_g \times 0.4\lambda_g$  using a substrate with Rogers Ro 4003 with a relative permittivity of 3.38 and thickness of 1.0 mm. The resulting structure exhibits a dual-band behavior. The first passband has a center frequency of 6.2 GHz with FBW of 16.833% and input reflection coefficient better than -30 dB and insertion loss is approximately equal to -0.3 dB. In the second passband, the center frequency is 9.6 GHz, and the FBW is 12.57% with an input reflection coefficient better than -25 dB and insertion loss is approximately equal to -0.5 dB. The transmission zero is located between the dual passbands at 7.8 GHz with over -28.66 dB of the stopband. The simulation and performance evaluation of the proposed filter have been carried out using Microwave Studio Suite of Computer Simulation Technology (CST). As a result, this makes the proposed filter candidate for operating in satellite applications.

**Keywords:** open-loop-resonator, microstrip bandpass filter, dual-band BPF filter, multi bandpass filter.

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