

**Dual-band balanced BPF using  $\lambda/4$  stepped-impedance resonators and folded feed lines**

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Abstract

This paper presents a second-order dual-band balanced bandpass filter (BPF) designed using bi-section quarter-wavelength ( $\lambda/4$ ) stepped-impedance resonators (SIRs) and folded feed lines. The first two modes of the  $\lambda/4$  SIRs are designed to resonate in the designated 2.4- and 5.2-GHz WLAN bands. High-impedance folded transmission-line sections are inserted in series with the feed lines to improve the overall impedance matching at the input/output ports, so that the signal transmission can be enhanced. In addition, the feed lines and  $\lambda/4$  SIRs are properly arranged to form an all-stop-like coupling configuration for common-mode operation. For the first (second) operating band of interest, the fabricated balanced BPF printed on an FR4 substrate was measured to have a minimum differential-mode insertion loss of 3.03 dB (4.3 dB) and a minimum common-mode rejection level of as high as 15.7 dB (22.3 dB).