

## **A tunable uniplannar band-pass filter circuit using a CPW-fed ACPS semi-ring structure**

Chuang, C.-C. ; Ho, Min-Hua

### Abstract

Most tunable band-pass filters (BPF) are operated with supplemental electronic circuits. These supplemental circuits need extra bias voltage or current source and the corresponding regulation circuits, which result in the increases of circuit complexity and cost. We propose a tunable uniplannar band-pass filter by using a CPW-fed asymmetric coplanar stripline (ACPS) semi-ring structure. The circuit of a passive configuration obtains the tuning function by adding to itself variable length of metal shorts. By placing arc-shaped metal patches on the top and bottom positions of an ACPS ring structure, it thus physically shorts the electric field in those locations may compose the ACPS semi-ring. A coplanar waveguide (CPW) is used to couple the feeding signal to and from the ACPS semi-ring via a narrow gap. By varying the arc length of the shorting metal patches, we can tune the pass-band's center frequency to a desired frequency from 3.80 GHz to 5.56 GHz. The achieved tuning ratio is as wide as 37.6 % for this proposed structure with the circuit insertion losses kept within 10 dB.

Key words : Uniplannar;Ring;BPF;CPW;ACPS