Ultra-Wideband Bandpass Filter using Microstrip-Coplanar Waveguide (CPW) Structure

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Abstract

In this paper, an ultra-wideband (UWB) bandpass filter (BPF) using Microstrip-coplanar waveguide structure (CPW) is presented. This filter consists of a microstrip line (on top), dielectric substrate (middle) and coplanar waveguide (on conductive ground). The proposed filter has been simulated and measured for UWB bandpass filter. The measured results demonstrate the UWB properties from 1.24 to 11.76 GHz (-10 dB bandwidth) and the potential to be wider.

This paper also introduced another filter structure which works as a dual-band ultra-wideband (UWB) bandpass filter. The dual-band operation was implemented by integrating a stub in the coupled conductors. The resonance of the stub introduces a narrow rejection band in the UWB passband which then results in a dual band filtering. Such a dual-band UWB bandpass filter is strongly required in a practical system in order to avoid the interference between the UWB radio systems and existing radio systems. The rejection band can be easily designed to some specific frequency band by tuning the length of the stub. The measured results demonstrate the
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ultra-wideband properties from 1.0800 GHz to 5.5157 GHz (-10 dB bandwidth) and rejected performance 5.5157 GHz to 5.6157 GHz (-10 dB bandwidth).

References

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Index Terms

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Keywords

Ultra-wideband, bandpass filter, dual-band, microstrip line, coplanar waveguide (CPW).