

A Novel Compact Tunable Dual-Band Bandstop Filter (DBBSF) with Spurline and Stepped-Impedance Resonator loaded with BST Capacitors

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Tunable Dual-Band Bandstop Filters (DBBSF) are important for filtering unwanted frequencies for adaptive communication systems. In this paper we present the results of tunable dual band bandstop filters fabricated with tunable Barium Strontium Titanate (BaSrTiO_3) capacitors. DC magnetron sputtered 200nm platinum films with 20nm of titanium film adhesion layer was used as the bottom electrode. The bottom electrode was patterned using standard photolithographic technique and ion-milling. BST capacitors were fabricated on Sapphire substrates using metalorganic solution deposition technique and annealed at a temperature of 800 °C for 30 minutes in oxygen environment. Top electrode 200nm platinum was also deposited by magnetron sputtering and patterned using photolithography and ion-milling. The designed tunable filter has a spurline section and a stepped impedance transformer to cover dual bands and both tuned with BST capacitors. The center frequency of the first band was tuned from 1.9GHz to 2GHz by applying a DC bias of 6V. The second band can be tuned from 3.2GHz to 3.6GHz with a DC bias of 6V.

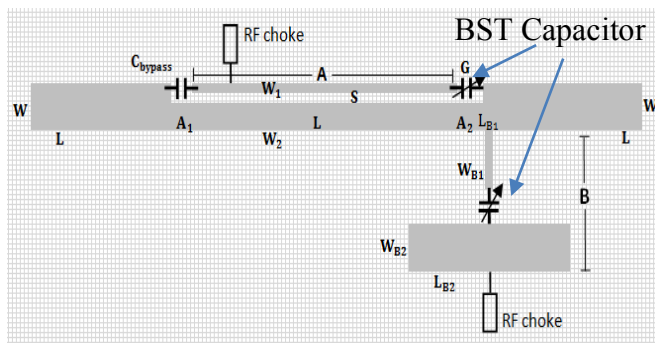


Fig.1 Layout of spurline and stepped impedance DBBSF filter tuned with BST capacitor

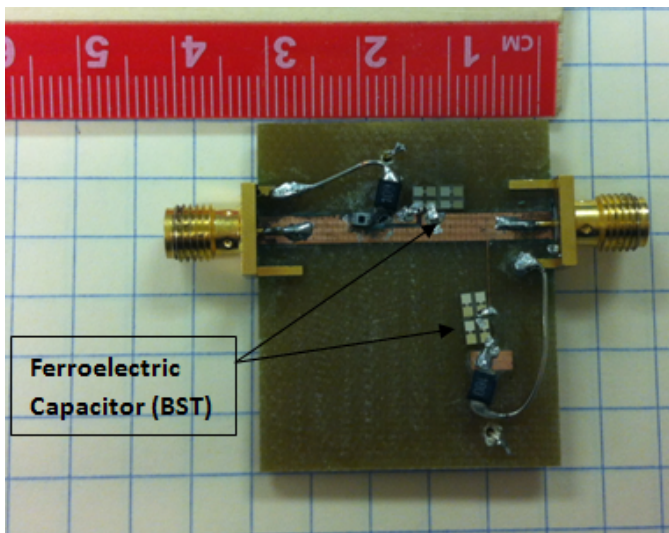


Fig.2 Photograph of dual band bandstop filter with BST capacitor.