

## **Novel compact microstrip ultra-wideband filter utilizing short-circuited stubs with less vias**

### **ABSTRACT**

We present here a new pattern with compact size of Ultra Wideband (UWB) microwave filter. The filter is based on quarter-wave length short-circuited stubs model. We introduced here a new schematic model by extracting all parasitic elements such as T-junction and discontinuity in our new pattern of UWB filter. This new filter has minimal number of vias and improved frequency bandwidth, insertion loss and return loss. It is fabricated on RT Duroid 5880 with 0.508mm of substrate thickness. The final dimension is measured as 21mm×14 mm. It is not only compact, but also delivers excellent scattering parameters with magnitude of insertion loss,  $|S_{21}|$  lower than 0.85 dB and return loss better than -11.6 dB. The fractional bandwidth is 109% from 3.06 GHz to 10.43 GHz. In the pass band, the measured group delay varies in between 0.47 ns to 0.32 ns, showing stability with minimum variation of only 0.15 ns.

**Keyword:** Ultra wideband; Filter; Short-circuited stubs