Compact UWB BPFs using Microstrip Stub-Loaded Multimode Resonators

- Compact size realized using microstrip open- or/and short-stub loaded multi-mode resonators.
- Wide passband with $FBW > 100\%$.
- Low loss with passband $I.L. = 0.5\sim1.4$ dB and $R.L.\sim15$dB.
- Easy for fabrication with minimum strip-width=$0.2$mm and minimum gap-width=$0.1$mm.
- Substrate with $\varepsilon_r=9.8$, thickness $h=1.27$mm, and loss $\tan\delta=0.003$.

UWB BPF using one open stub-loaded dual-mode resonator doublet

UWB BPF using three cascaded open stub-loaded dual-mode resonator doublets

UWB BPF using one open- and short-stub-loaded three-mode resonator
Three-mode H-shaped Resonator Bandpass Filter

- Compact size realized with H-shaped resonator.
- Three-mode resonator having two odd-mode and one even-mode resonances.
- High skirt selectivity with four transmission zeros located near the passband edges.
- Low loss with $I.L. = 1$ dB in passband and wide stopband characteristic.

![Electric-field distributions](image1)

Filter layout

Fabricated filter

Frequency response

Dual-Mode Loop Resonator Bandpass Filters

- Filter designs based on the combination of synthesis theory and parameter-extraction method for transversal resonator array filter circuit.
- Two transmission zeros (TZs) generated at predetermined finite frequencies.
- Direct source/load coupling used for two TZs.

![Equivalent circuit for designs of transversal resonator array filter](image2)

Fabricated filters

Frequency responses