RF and Microwave Filter Design By Means of Single Transistor Active Inductors

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RF and Microwave active filters design by the use of grounded active inductor (AI) is here presented. The proposed single transistor AI emulates an inductor behaviour by implementing a passive variable phase and amplitude compensating network and amplifiers, forming a similar gyrator-C architecture allowing its use in LC filters architectures at high frequencies with high quality factor and reduced occupied chip area. The design method can be appliedwith success, in particular, for the design of bandpass filters with very high performances in terms integration and application from RF to Microwave frequency rangeachieving active filterswith relatively high dynamic range, constant Q and also easy frequency tuning capability.