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Lumped AME Filter

Story

Lumped AME Filter

The focus of the Lumped AME Filter story does not lie on designing a specific filter configuration but instead it is intended to derive a general methodology which enables an automatic design process according to a given filter curve, resulting in a ready-to-print CAD model.

1. Requirements

To finish the Lumped AME Filter design procedure, the following requirements must be fulfilled:

- The final Lumped AME Filter design procedure shall be completely automatic
- The input to the procedure shall only consist of the filter curve as well as the targeted power level of the filter
- The output of the Lumped AME Filter design procedure shall be a parameterized CAD model of a lumped L-C-chain that fulfills the required filter curve within a certain tolerance. The tolerance shall also be provided throughout the procedure.
- The final Lumped AME Filter design procedure shall validate if the desired frequency range lies within the capabilities of lumped element filters of the chosen printer technology
- The final Lumped AME Filter design procedure shall validate if the desired power going through the filter lies within the handling capabilities of the chosen printer technology
- The number of used elements shall be kept as small as possible
- The best fitting geometry of the used elements shall be selected automatically so that the resulting structure has minimum volume
- In the process of selecting the best geometry for the single elements, the discretization error of the slicing process shall be considered and the geometry that fits closest to the required values for the capacity and inductivity shall be selected

2. Targeted Architecture:

The Lumped AME Filter that is derived using the procedure of this story will consist of capacities and coils connected in such a way that the required filter curve is achieved. As an interface to the measurement infrastructure to validate the filter functionality, SMA connectors will be used.