Abstract

In this master thesis, the application of digital signal processing in the field of EMC analysis is explained. The algorithms are developed to transform time domain signals to an EMI receiver result. The algorithms use signal processing concepts such as filtering, resampling and fourier transforms that are extensively used in the field of EMC/EMI measurements and/or circuit simulations along with the necessary data treatment steps and strategies are provided.

The input time domain signal acquisition can differ for e.g. measured or simulated signals. The post processing method remains the same irrespective of the method of input acquisition.

The EMC analysis standards define requirements, calibration methods and the frequency ranges in terms of detectors such as peak, average, and quasi peak detectors. The design specifications mentioned in such standards are considered to digitally realize the detectors.

A MATLAB based standalone tool to support the method described in this master thesis was developed. It serves in the practical Valeo Siemens eAutomotive Germany GmbH EMC design flow in a real world application.
For verification it expresses the view of direct comparsion of simulation with measurement results.

Keywords: Window techniques, frequency transformation, peak detection, quasi peak detection, average detection.