

Abstract

The recent state in the development of electronics requires knowledge and practice in accurate impedance measurement in a wide frequency range. There are many fields in science that require impedance measurement, not only electronics but also chemical analysis and medical examinations too. That's why it's very important to improve the known methods and develop some new ones.

This thesis is about impedance measurement with Agilent E5061B network analyzer. The device can measure transfer functions of linear systems. The low frequency port can measure to from 5 Hz 30 MHz, and the high (radio) frequency port can measure from 5 Hz to 3 GHz. With the former we can analyze two-poles, the latter is appropriate to measure four-poles, too.

The network analyzer is capable of executing impedance measurement methods at high frequencies. There are some methods in the document provided by the manufacturer called Impedance Measurement with E5061BLF-RF Network Analyzer [1]. In this thesis one can find my experiences, measurements and results, with the low frequency port.

During my experiments I deeply analysed two methods. After the experiments and conclusions an adapter panel was created that can be connected to the low frequency port and is appropriate to measure two-poles from 5 Hz to 30 MHz frequency. This thesis provides a guidance on the appropriate measurement arrangements and helps to determine the available measurement accuracy too. The recommended software settings can make the measurements easier. These are saved into the memory of the network analyzer, and can be used at any time.