

Abstract

Modern technologies are getting depended on efficiency. This efficiency includes size reduction, cost reduction, supply power reduction. All these facilities comes with obvious generation of noise. The more a device is noise free the more it becomes efficient. All the electronic device or equipment are produced including the effect of electromagnetic interference. This interference is defined as the noise that travels through the electronic components like resisters, inductors, capacitors, wires, printed circuit board or through the overall design. This form of EMI has serious impact on malfunctioning. To reduce this interference a specific filter is used called EMI filter.

Ideally an EMI filter is a low pass filter that blocks the high frequencies as well as the noise flow while passing through the input. It will also reduce the amplitude of high frequency signals (which are greater than the cutoff frequency). This filter is constructed with two lumped elements inductors and capacitors. There are number of orders of this filter depending on the components alignment and value.

This thesis work will deals with an EMI filter constructed with basic components. We will measure the unintended radiated electromagnetic wave from test kit and the disturbance it creates as well as model how much radiation actually produced. We will apply different valued inductors, capacitors and chocks to measure the filter effect first and then we will synthesize the disturbances. We are going to use the Microwave Office software (AWR) so that we can import S perimeters to AWR and simulate the actual device. The simulation of this filter circuit will be done both in frequency and time domain and at the end we will compare the performance analysis between the manufacturers' circuit board and simulated filter.

Before starting the lab work several filter will be designed and tested in AWR platform to identify the least disturbance circuit. A commercial printed circuit will be provided and having that in hand earlier will shorten the designing time.