

Master Thesis: 3D-EMC scan equipment for Radiated levels and susceptibility for radiation

The master thesis work will include electronic hardware investigation and design, instrument automation and a software part that mainly will consist of processing measured data, process camera data, and presenting results in a 3-D graphical view.

Background

EMC in the electronic industry is a costly and difficult part of the design work. Testing is often made late in projects due to that external test-facilities often is used and that the measurement results are depending on correct mechanics, SW and electronic HW. Since the potential problems are discovered late in project the effects are severe.

One way of treating this is to do early EMC measurements. This is done with the knowledge that the results are not comparable to what should be seen in final testing. But the results could show indications of problems that might occur.

EMC measurements are time-consuming and repetitive. By automating the test procedure it is anticipated that test time decreases and repeatability and measurement resolution increases.

Scope

The Master thesis shall:

- Investigate how a combined EMC scanner for radiation and susceptibility can be made in the same measurement setup.
 - Probes to be used for transmit and receive
 - Instruments needed for reading received radiation levels.
 - Equipment needed to be able to transmit radiated levels.
- Investigate how to extract and use mechanical data from the unit that shall be tested.
 - The EMC scanner shall follow the 3D outline of the unit in X, Y and Z plane.
- Collect and process measurement data
 - Process data from measurement equipment.
 - Include data from the tested unit.
 - Process data from camera.
- Ways of presenting 2-D graphs and 3D-presentation of results
 - 2D data needs to be presented in ways that is comparable with industry standards.
 - 3D data needs to be presented in a way that combine the measured data in 3D and the 3D data from the unit
- Way of saving measured data that could create statistics and functions to relate design with EMC performance
 - Measured data needs to be processed so that synergy between different designs could be investigated.
- Design and implementation of the scanning equipment
 - Design scanning equipment
 - PCB design

The master thesis will be derived in both HW and SW parts that will run in parallel