UNIVERSITÄT DUISBURG ESSEN

Fachgebiet Hochfrequenztechnik

H F T

Fachbereich Ingenieurwissenschaften
Abteilung Elektrotechnik und Informationstechnik

Prof. Dr.-Ing. K. Solbach
Prof. Dr.-Ing. A. Beyer

Aufgabe der Abschlussarbeit im ISE Masterstudiengang

für: Herr Muhammad **Faisal**

gestellt von: Prof. Dr.-Ing. Klaus Solbach
Fakultät für Ingenieurwissenschaft - Hochfrequenztechnik

Thema: **Optimized analysis test for ARS400 RF Modules in Series and Retouring samples**

Beschreibung:

ARS400 is a 4th Generation Radar Sensor. Pulse compression Radar technique "Chirp Radar" is the main feature of this Radar. In Automotive some basic implementations of this sensor are Adaptive Cruise Control (ACC) and Emergency Brake Assist (EBA) etc. ARS400 is divided into two sub categories with different capabilities i.e. Long Range Radar (LRR)/Premium/Premium Plus and Mid Range Radar (MRR)/Entry. Each sensor has a High Frequency (RF PCB) and Low Frequency (NF PCB). RF PCB is the main concern in our task. It consists of Transmitting and Receiving part which operate at Frequency range from76 to 77GHz. With respect Field of View of sensor it has two ranges: Near Range (NRS) and Far Range (FRS). The figures show Front and Back end of RF PCB and Field of View of ARS400 Premium:
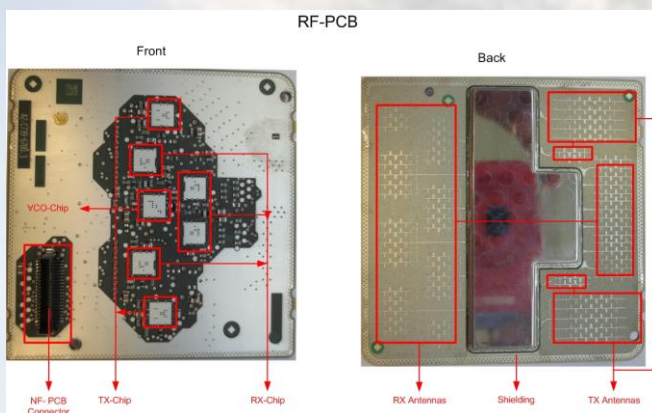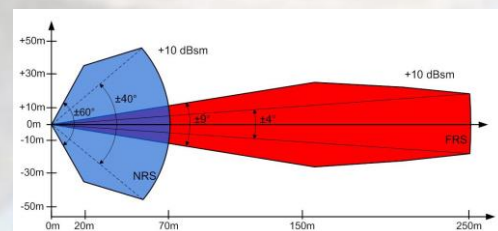

Figure: ARS400 Premium RF PCB

Figure: Field of View of ARS400 (LRR) Premium

Goal:

Analysis test is used for the support analysis of ARS400 RF Modules for Series and Retouring. After the Development and Production of ARS400 the new task is how to deal with failures in the sensor. To solve this issue a Test setup is required. The main objective of this work is to optimize the existing test solution in terms of (low) cost and functionalities. A Graphical User Interface (GUI) programmed in Matlab is required for test automation.

Tasks:

The Thesis has the following tasks
1) Comparison of different optimized test variants w.r.t. benefits in costs and performance
2) Definition of needed function tests
3) Planning and realization of optimized laboratory test setup for ARS400 RF Modules
4) Realization of tests in form of flow diagrams
5) Definition of equipment interfaces
6) Automation of test via Matlab
7) Verification of test with one sample sensor
8) Outlook to further optimizations

At the end of the work a public presentation of results is to be given.